Computer Algebra Independent Integration Tests

Summer 2023 edition

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

Nasser M. Abbasi

September 5, 2023 Compiled on September 5, 2023 at 2:08pm

Contents

CHAPTER 1

INTRODUCTION

This report gives the result of running the computer algebra independent integration test.The download section in on the main webpage contains links to download the problems in plain text format used for all CAS systems. The number of integrals in this report is [703]. This is test number [143].

1.1 Listing of CAS systems tested

The following are the CAS systems tested:

1. Mathematica 13.3.1 (August 16, 2023) on windows 10.
2. Rubi 4.16.1 (Dec 19, 2018) on Mathematica 13.3 on windows 10
3. Maple 2023.1 (July, 12, 2023) on windows 10.
4. Maxima 5.47 (June 1, 2023) using Lisp SBCL 2.3.0 on Linux via sagemath 10.1 (Aug 20, 2023).
5. FriCAS 1.3.9 (July 8, 2023) based on sbcl 2.3.0 on Linux via sagemath 10.1 (Aug 20, 2023).
6. Giac/Xcas 1.9.0-57 (June 26, 2023) on Linux via sagemath 10.1 (Aug 20, 2023).
7. Sympy 1.12 (May 10, 2023) Using Python 3.11.3 on Linux.
8. Mupad using Matlab 2021a with Symbolic Math Toolbox Version 8.7 on windows 10.

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

Sympy was run directly in Python not via sagemath.

1.2 Results

Important note: A number of problems in this test suite have no antiderivative in closed form. This means the antiderivative of these integrals can not be expressed in terms of elementary, special functions or `Hypergeometric2F1` functions. `RootSum` and `RootOf` are not allowed. If a CAS returns the above integral unevaluated within the time limit, then the result is counted as passed and assigned an A grade.

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

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

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

System	% solved	% Failed
Rubi	100.00 (703)	0.00 (0)
Mathematica	99.29 (698)	0.71 (5)
Maple	78.95 (555)	21.05 (148)
Fricas	37.70 (265)	62.30 (438)
Maxima	35.99 (253)	64.01 (450)
Giac	33.85 (238)	66.15 (465)
Sympy	29.73 (209)	70.27 (494)
Mupad	20.77 (146)	79.23 (557)

Table 1.1: Percentage solved for each CAS

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

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

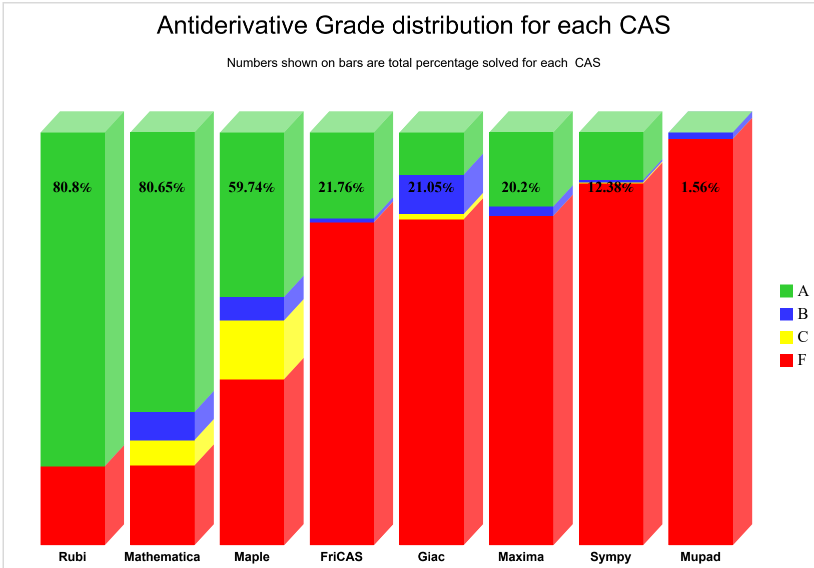
Table 1.2: Description of grading applied to integration result

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

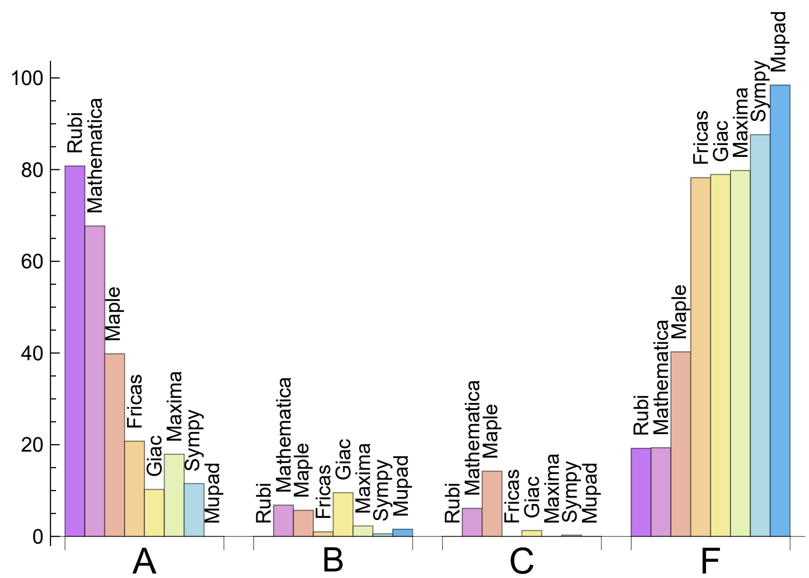
System	% A grade	% B grade	% C grade	% F grade
Rubi	80.797	0.000	0.000	19.203
Mathematica	67.710	6.828	6.117	19.346
Maple	39.829	5.690	14.225	40.256
Fricas	20.768	0.996	0.000	78.236
Maxima	17.923	2.276	0.000	79.801
Sympy	11.522	0.569	0.284	87.624
Giac	10.242	9.531	1.280	78.947
Mupad	0.000	1.565	0.000	98.435

Table 1.3: Antiderivative Grade distribution of each CAS

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



The figure below compares the grades of the CAS systems.



The following table shows the distribution of the different types of failures for each CAS. There are 3 types failures. The first is when CAS returns the input within the time limit, which means it could not solve it. This is the typical failure and given as **F**.

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

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

System	Number failed	Percentage normal failure	Percentage timeout failure	Percentage exception failure
Rubi	0	0.00	0.00	0.00
Mathematica	5	20.00	80.00	0.00
Maple	148	100.00	0.00	0.00
Fricas	438	85.16	0.00	14.84
Giac	465	59.35	3.23	37.42
Maxima	450	73.11	0.00	26.89
Sympy	494	82.39	17.21	0.40
Mupad	557	0.00	100.00	0.00

Table 1.4: Failure statistics for each CAS

1.3 Time and leaf size Performance

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

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

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

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

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

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

System	Mean time (sec)
Mupad	0.18
Rubi	0.25
Fricas	0.26
Maple	0.50
Maxima	0.52
Giac	1.95
Mathematica	2.84
Sympy	9.48

Table 1.5: Time performance for each CAS

System	Mean size	Normalized mean	Median size	Normalized median
Mupad	26.54	1.02	28.00	1.00
Sympy	123.97	1.27	29.00	1.04
Maxima	158.22	2.30	130.00	1.00
Fricas	165.74	1.81	98.00	1.32
Rubi	231.79	1.00	189.00	1.00
Mathematica	257.05	1.11	176.00	1.02
Giac	427.24	2.70	72.50	1.11
Maple	436.61	1.83	210.00	1.24

Table 1.6: Leaf size performance for each CAS

1.4 Performance based on number of rules Rubi used

This section shows how each CAS performed based on the number of rules Rubi needed to solve the same integral. One diagram is given for each CAS.

On the y axis is the percentage solved which Rubi itself needed the number of rules given the x axis. These plots show that as more rules are needed then most CAS system percentage of solving decreases which indicates the integral is becoming more complicated to solve.

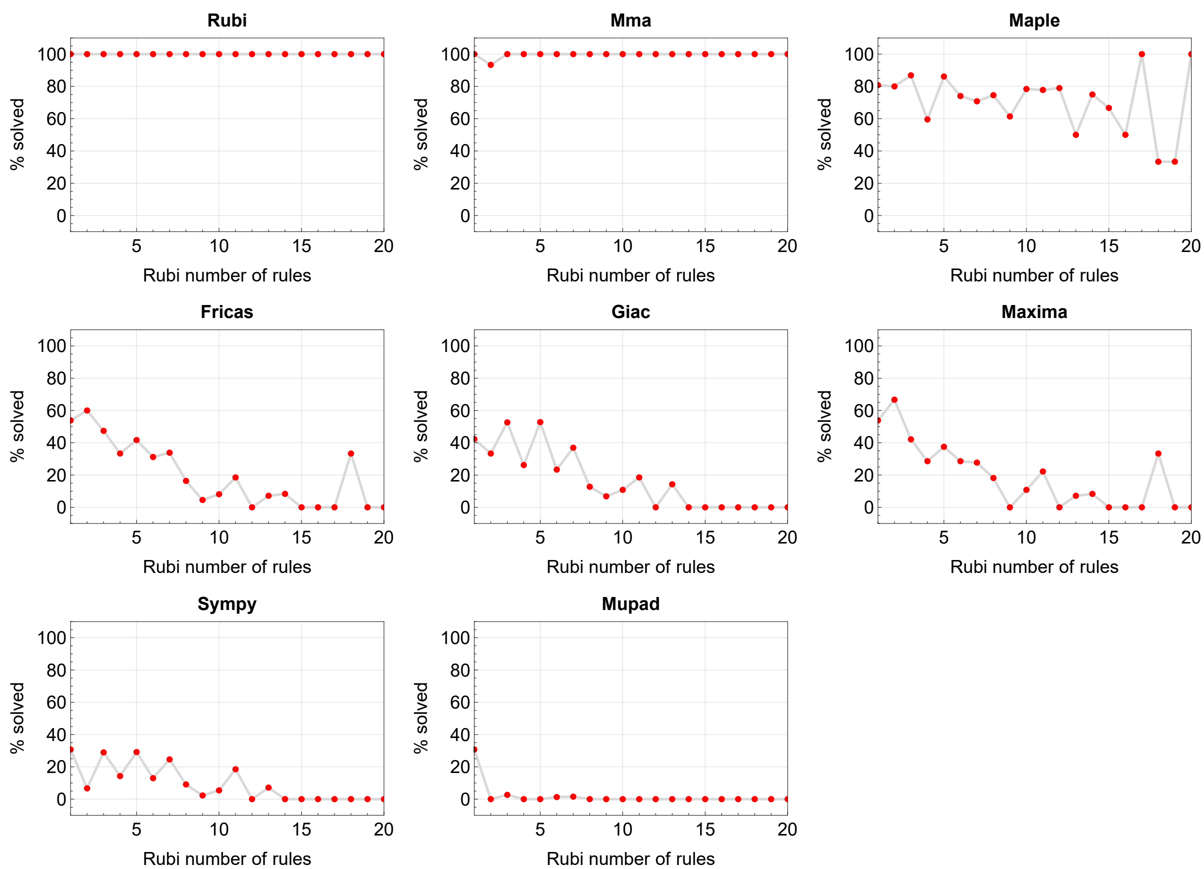


Figure 1.1: Solving statistics per number of Rubi rules used

1.5 Performance based on number of steps Rubi used

This section shows how each CAS performed based on the number of steps Rubi needed to solve the same integral. Note that the number of steps Rubi needed can be much higher than the number of rules, as the same rule could be used more than once.

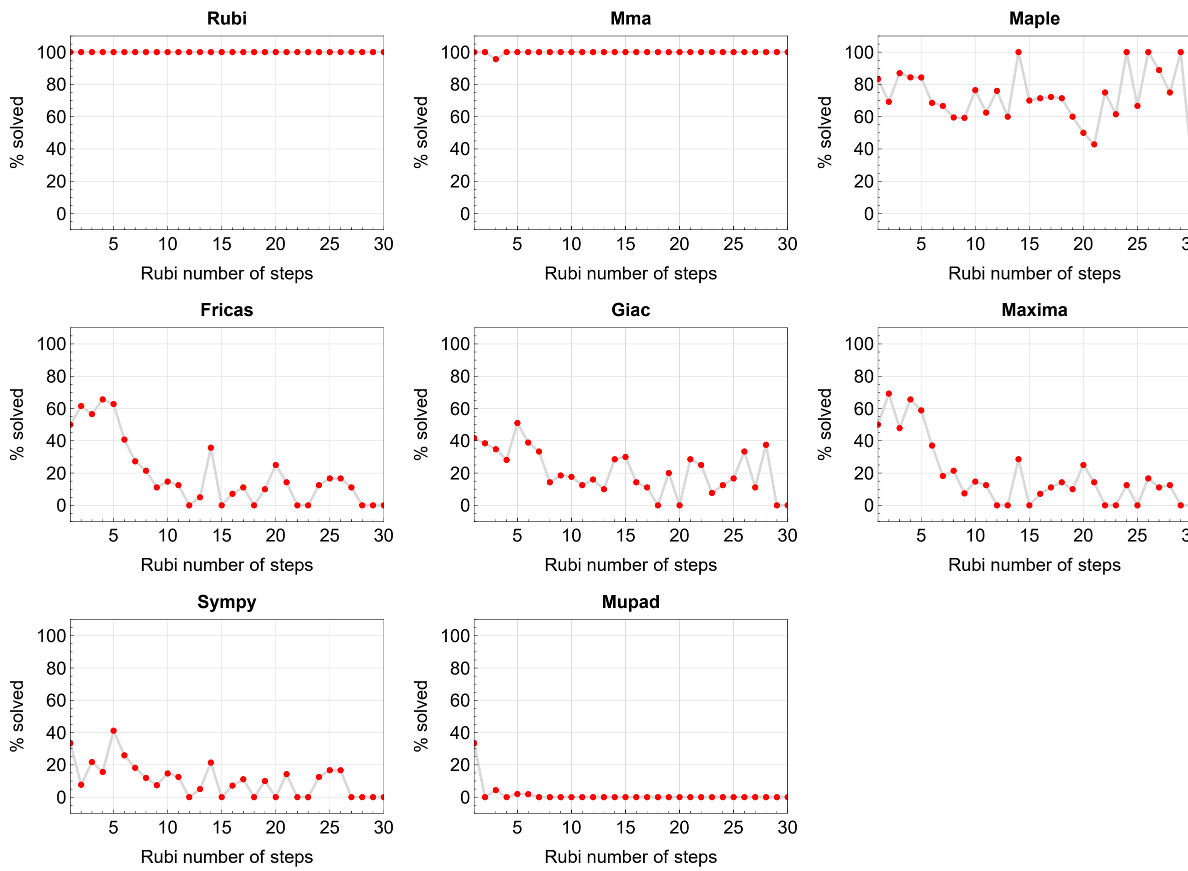


Figure 1.2: Solving statistics per number of Rubi steps used

The above diagram show that the precentage of solved intergals decreases for most CAS systems as the number of steps increases. As expected, for integrals that required less steps by Rubi, CAS systems had more success which indicates the integral was not as hard to solve. As Rubi needed more steps to solve the integral, the solved percentage decreased for most CAS systems which indicates the integral is becoming harder to solve.

1.6 Solved integrals histogram based on leaf size of result

The following shows the distribution of solved integrals for each CAS system based on leaf size of the antiderivatives produced by each CAS. It shows that most integrals solved produced leaf size less than about 100 to 150. The bin size used is 40.

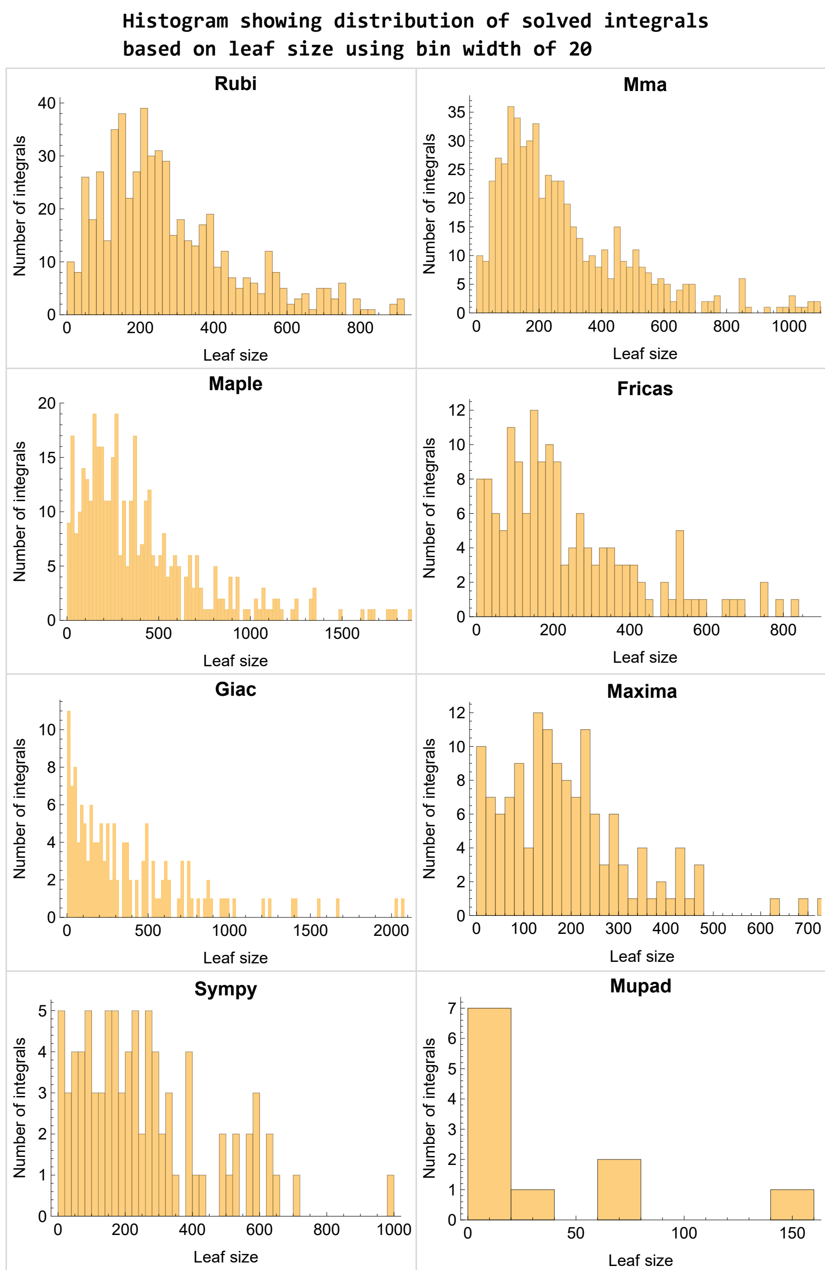


Figure 1.3: Solved integrals based on leaf size distribution

1.7 Solved integrals histogram based on CPU time used

The following shows the distribution of solved integrals for each CAS system based on CPU time used in seconds. The bin size used is 0.1 second.

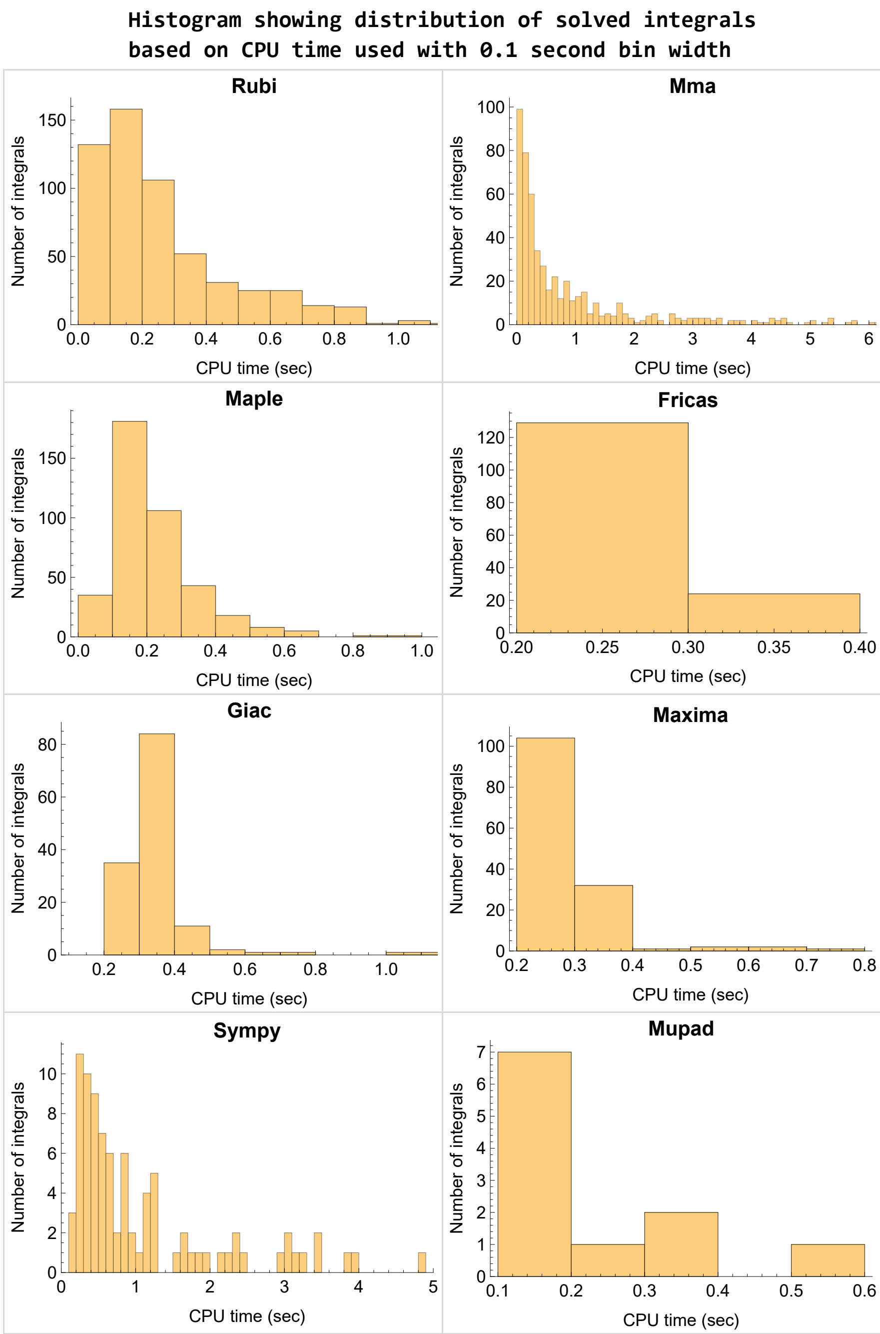


Figure 1.4: Solved integrals histogram based on CPU time used

1.8 Leaf size vs. CPU time used

The following shows the relation between the CPU time used to solve an integral and the leaf size of the antiderivative.

The result for Fricas, Maxima and Giac is shifted more to the right than the other CAS system due to the use of sagemath to call them, which causes an initial slight delay in the timing to start the integration due to overhead of starting a new process each time. This should also be taken into account when looking at the timing of these three CAS systems. Direct calls not using sagemath would result in faster timings, but current implementation uses sagemath as this makes testing much easier to do.

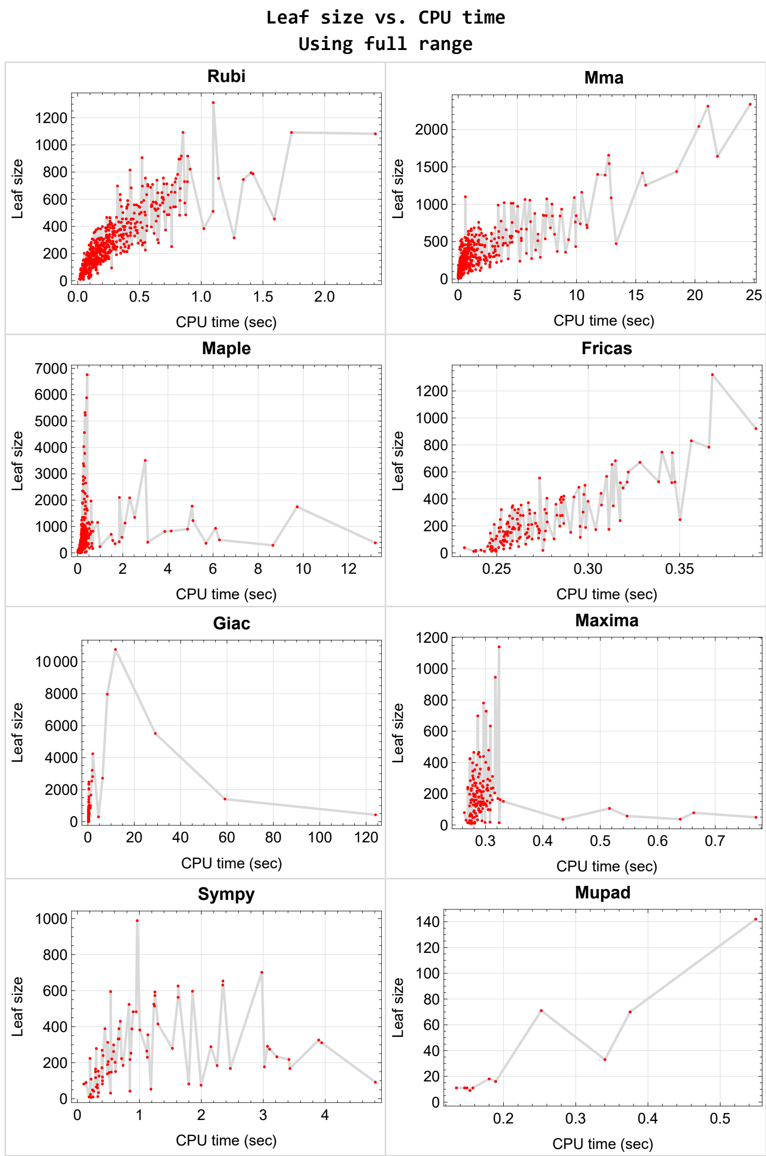


Figure 1.5: Leaf size vs. CPU time. Full range

1.9 list of integrals with no known antiderivative

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

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

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Mupad {}

1.11 list of integrals solved by CAS but failed verification

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

Rubi {}

Mathematica {198, 200, 207, 209, 252, 260, 545, 551, 557, 564, 569, 570, 571, 572, 574, 575, 647, 648}

Maple {625, 627, 629, 630, 631, 632, 633, 635, 636, 637, 638, 639, 640, 641, 644, 645, 646, 647, 648}

Maxima Verification phase not currently implemented.

Fricas Verification phase not currently implemented.

Sympy Verification phase not currently implemented.

Giac Verification phase not currently implemented.

Mupad Verification phase not currently implemented.

1.12 Timing

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

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

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

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

1.13 Verification

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

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

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

1.14 Important notes about some of the results

Important note about Maxima results

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

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

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

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

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

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

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

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

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

Important note about FriCAS result

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

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

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

Important note about finding leaf size of antiderivative

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

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

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

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

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

  except Exception as ee:
       leafCount =1
```

Important note about Mupad results

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

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

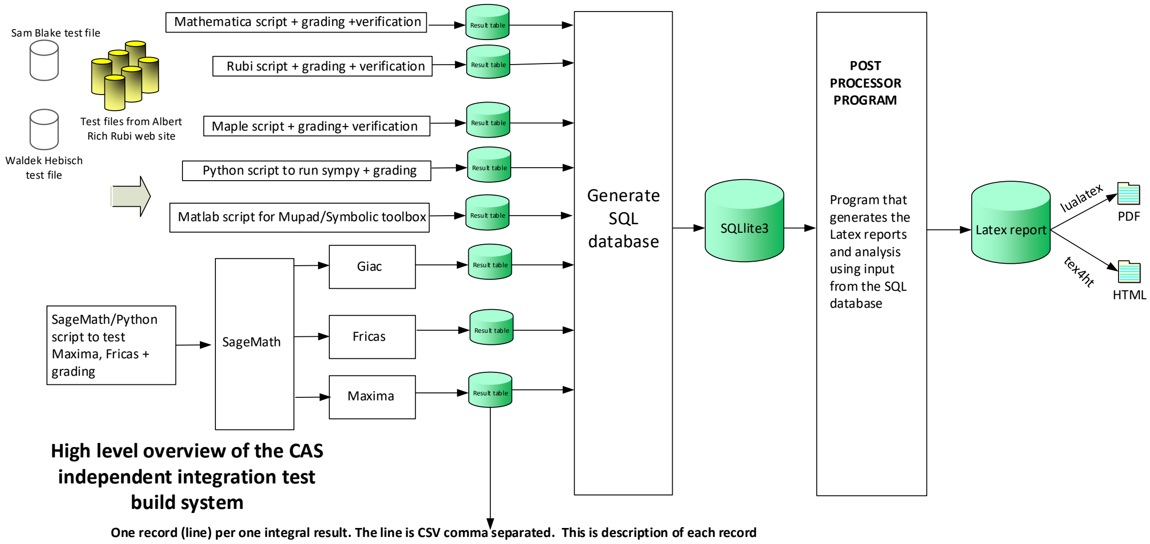
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

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

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

1.15 Design of the test system

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



One record (line) per one integral result. The line is CSV comma separated. This is description of each record

1. integer, the problem number.
2. integer. 0 for failed, 1 for passed, -1 for timeout, -2 for CAS specific exception. (this is not the grade field)
3. integer. Leaf size of result.
4. integer. Leaf size of the optimal antiderivative.
5. number. CPU time used to solve this integral. 0 if failed.
6. string. The integral in Latex format
7. string. The input used in CAS own syntax.
8. string. The result (antiderivative) produced by CAS in Latex format
9. string. The optimal antiderivative in Latex format.
10. integer. 0 or 1. Indicates if problem has known antiderivative or not
11. String. The result (antiderivative) in CAS own syntax.
12. String. The grade of the antiderivative. Can be “A”, “B”, “C”, or “F”
13. String. Small string description of why the grade was given.
14. integer. 1 if result was verified or 0 if not verified. (For mma, rubi and maple only)

*The following fields are present only in **Rubi** Table file*

15. integer. Number of steps used.
16. integer. Number of rules used.
17. integer. Integrand leaf size.
18. real number. Ratio. Field 16 over field 17
19. String of form “{n,n,..}” which is list of the rules used by Rubi
20. String. The optimal antiderivative in Mathematica syntx

Nasser M. Abbasi
June 27, 2023
Design.vsdx

CHAPTER 2

DETAILED SUMMARY TABLES OF RESULTS

2.1 List of integrals sorted by grade for each CAS

Rubi

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

B grade { }

C grade { }

F normal fail { }

F(-1) timedout fail { }

F(-2) exception fail { }

Mma

A grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 37, 40, 43, 45, 47, 49, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 120, 122, 123, 124, 125, 126, 127, 128, 129, 131, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 185, 187, 194, 195, 196, 201, 202, 203, 204, 205, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 289, 290, 291, 292, 293, 295, 296, 297, 298, 299, 300, 301, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 316, 317, 318, 319, 320, 325, 326, 327, 328, 333, 334, 335, 336, 341, 342, 343, 344, 345, 346, 349, 350, 351, 352, 353, 354, 374, 375, 376, 379, 381, 382, 383, 384, 390, 391, 392, 393, 399, 400, 401, 402, 408, 409, 410, 411, 412, 413, 430, 444, 449, 453, 457, 462, 468, 473, 474, 479, 482, 483, 484, 487, 488, 489, 492, 493, 494, 498, 499, 500, 501, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 522, 523, 524, 525, 526, 527, 528, 530, 531, 532, 533, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 552, 553, 554, 555, 556, 558, 559, 560, 562, 563, 565, 566, 567, 569, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 589, 590, 592, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 654, 655, 656, 659, 660, 661, 662, 663, 668, 669, 670, 677, 678, 679 }

B grade { 29, 31, 32, 33, 34, 35, 36, 38, 39, 41, 42, 44, 46, 48, 50, 51, 52, 53, 184, 186, 188, 189, 190, 191, 192, 193, 197, 198, 199, 200, 206, 207, 208, 209, 294, 521, 529, 534, 551, 557, 561, 564, 568, 570, 571, 588, 591, 593 }

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

F normal fail { 441 }

F(-1) timedout fail { 689, 690, 693, 694 }

F(-2) exception fail { }

Maple

A grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 50, 51, 52, 53, 54, 65, 66, 67, 81, 82, 83, 96, 97, 98, 99, 100, 101, 102, 103, 105, 106, 107, 108, 114, 115, 117, 125, 127, 136, 138, 156, 157, 158, 159, 160, 161, 162, 164, 165, 166, 167, 168, 169, 170, 171, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 184, 186, 187, 189, 191, 192, 193, 194, 196, 198, 200, 201, 203, 204, 205, 207, 209, 214, 216, 223, 224, 231, 232, 240, 242, 246, 248, 249, 250, 251, 252, 254, 256, 258, 260, 262, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 289, 290, 291, 293, 294, 298, 299, 300, 301, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 316, 317, 318, 319, 320, 325, 326, 327, 328, 333, 334, 335, 336, 341, 342, 343, 344, 345, 346, 349, 350, 351, 352, 353, 354, 374, 375, 376, 381, 382, 383, 384, 390, 391, 392, 393, 399, 400, 401, 402, 408, 409, 410, 411, 412, 413, 430, 431, 432, 433, 434, 436, 437, 438, 439, 444, 449, 453, 457, 462, 464, 468, 474, 479, 501, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 659, 660, 661, 662, 668, 669, 670, 677, 678, 679, 686, 687, 688, 695, 696, 697, 700, 701 }

B grade { 33, 47, 49, 104, 110, 112, 163, 172, 188, 190, 195, 197, 199, 206, 208, 215, 217, 222, 225, 230, 233, 235, 237, 239, 241, 243, 244, 245, 247, 253, 255, 257, 259, 261, 263, 634, 642, 643, 691, 692 }

C grade { 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 109, 111, 113, 116, 118, 119, 120, 121, 122, 123, 124, 126, 128, 129, 130, 131, 132, 133, 134, 135, 137, 139, 140, 202, 210, 211, 212, 213, 218, 219, 220, 221, 226, 227, 228, 229, 234, 236, 238, 295, 296, 297, 441, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 635, 636, 637, 638, 639, 640, 641, 644, 645, 646, 647, 648 }

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

F(-1) timedout fail { }

F(-2) exception fail { }

Fricas

A grade { 1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 21, 22, 23, 25, 27, 40, 47, 49, 60, 61, 62, 63, 64, 73, 74, 75, 76, 77, 78, 79, 80, 90, 91, 92, 93, 94, 95, 99, 101, 102, 103, 104, 105, 107, 109, 111, 113, 116, 118, 119, 121, 123, 130, 132, 134, 156, 157, 158, 159, 160, 165, 166, 167, 168, 169, 174, 175, 176, 177, 178, 195, 202, 204, 210, 212, 218, 220, 226, 228, 234, 236, 238, 264, 265, 266, 267, 268, 289, 290, 291, 303, 304, 305, 306, 307, 346, 354, 379, 413, 430, 457, 462, 474, 479, 501, 509, 526, 527, 531, 536, 537, 577, 582, 587, 596, 597, 598, 599, 600, 602, 604, 605, 606, 607, 608, 609, 611, 613, 614, 615, 616, 617, 618, 620, 622, 623, 659, 660, 661, 662 }

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

C grade { }

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

F(-1) timedout fail { }

F(-2) exception fail { 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 458, 459, 460, 461, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 475, 476, 477, 478, 480, 481, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703 }

Maxima

A grade { 1, 2, 3, 4, 5, 7, 9, 11, 12, 14, 16, 18, 23, 25, 27, 59, 60, 61, 62, 63, 64, 73, 74, 75, 76, 77, 78, 79, 80, 90, 91, 92, 93, 94, 95, 99, 101, 102, 103, 104, 105, 107, 109, 111, 113, 114, 116, 118, 121, 124, 126, 132, 133, 135, 139, 140, 156, 158, 210, 212, 218, 220, 226, 228, 234, 236, 238, 239, 265, 267, 268, 272, 289, 290, 291, 292, 293, 294, 298, 299, 300, 304, 306, 307, 346, 354, 413, 430, 501, 509, 525, 526, 527, 531, 532, 533, 536, 537, 538, 539, 596, 597, 598, 599, 600, 602, 604, 605, 606, 607, 608, 609, 611, 613, 614, 615, 616, 617, 618, 620, 622, 623, 659, 660, 661, 662 }

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

C grade { }

F normal fail { 6, 8, 15, 17, 24, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 65, 66, 67, 68, 69, 70, 71, 72, 81, 82, 83, 84, 85, 86, 87, 88, 89, 96, 97, 98, 100, 106, 108, 110, 112, 115, 117, 119, 120, 122, 123, 125, 127, 128, 129, 130, 131, 134, 136, 137, 138, 141, 142, 143, 144, 145, 149, 150, 151, 152, 153, 154, 155, 157, 159, 161, 162, 163, 164, 166, 168, 170, 171, 172, 173, 175, 177, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 211, 213, 214, 215, 216, 217, 219, 221, 222, 223, 224, 225, 227, 229, 230, 231, 232, 233, 235, 237, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 266, 269, 270, 271, 273, 274, 275, 276, 277, 278, 295, 296, 297, 301, 303, 305, 308, 309, 310, 311, 312, 313, 316, 317, 318, 319, 320, 325, 326, 327, 328, 333, 334, 335, 336, 341, 342, 343, 344, 345, 349, 350, 351, 352, 353, 374, 375, 376, 381, 382, 383, 384, 390, 391, 392, 393, 399, 400, 401, 402, 408, 409, 410, 411, 412, 431, 432, 433, 434, 436, 437, 438, 439, 482, 483, 484, 487, 488, 489, 492, 493, 494, 504, 505, 506, 507, 508, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 528, 529, 530, 534, 535, 568, 574, 575, 592, 593, 601, 603, 610, 612, 619, 621, 625, 627, 629, 631, 633, 635, 636, 641, 642, 643, 644, 645, 652, 653, 654, 655, 656, 668, 669, 670, 677, 678, 679, 686, 687, 688, 691, 692, 695, 696, 697, 700, 701 }

F(-1) timedout fail { }

F(-2) exception fail { 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 497, 498, 499, 500, 502, 503, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 569, 570, 571, 572, 573, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 594, 595, 624, 626, 628, 630, 632, 634, 637, 638, 639, 640, 646, 647, 648, 649, 650, 651, 663, 664, 665, 666, 689, 693, 698 }

Giac

A grade { 1, 2, 3, 4, 5, 10, 11, 12, 13, 14, 19, 20, 21, 22, 23, 40, 47, 99, 101, 103, 104, 105, 140, 156, 158, 160, 166, 169, 175, 264, 266, 267, 268, 289, 290, 291, 303, 305, 306, 307, 311, 312, 313, 319, 320, 328, 341, 343, 344, 345, 346, 350, 352, 353, 354, 374, 375, 376, 413, 430, 441, 457, 462, 501, 597, 599, 600, 609, 662, 668, 669, 670 }

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

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

F normal fail { 6, 8, 15, 17, 24, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 44, 45, 46, 48, 50, 51, 52, 53, 54, 55, 56, 68, 69, 84, 85, 106, 108, 110, 112, 113, 114, 125, 126, 127, 128, 136, 137, 138, 139, 141, 142, 143, 144, 145, 152, 155, 161, 162, 163, 170, 171, 172, 179, 181, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 196, 197, 198, 199, 201, 203, 205, 206, 207, 208, 211, 219, 227, 235, 237, 238, 239, 250, 251, 252, 253, 260, 261, 262, 263, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 292, 293, 294, 298, 299, 300, 301, 308, 309, 310, 431, 432, 433, 434, 436, 437, 438, 439, 444, 449, 453, 455, 456, 460, 461, 465, 466, 467, 468, 471, 472, 473, 474, 477, 478, 479, 482, 487, 492, 499, 500, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 601, 603, 610, 612, 619, 621, 625, 627, 628, 629, 630, 632, 633, 634, 637, 638, 639, 641, 642, 643, 646, 647, 648, 651, 652, 653, 654, 655, 656, 663, 700, 701 }

F(-1) timedout fail { 27, 43, 164, 173, 180, 182, 200, 209, 497, 631, 635, 636, 640, 644, 645 }

F(-2) exception fail { 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 100, 102, 109, 111, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 129, 130, 131, 132, 133, 134, 135, 149, 150, 151, 153, 154, 210, 212, 213, 214, 215, 216, 217, 218, 220, 221, 222, 223, 224, 225, 226, 228, 229, 230, 231, 232, 233, 234, 236, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 254, 255, 256, 257, 258, 259, 265, 282, 283, 284, 286, 287, 295, 296, 297, 304, 317, 321, 323, 329, 331, 337, 339, 342, 349, 351, 355, 358, 360, 363, 365, 367, 368, 369, 380, 381, 385, 387, 389, 394, 396, 398, 403, 405, 408, 410, 414, 417, 419, 421, 424, 426, 428, 435, 440, 442, 443, 447, 448, 451, 452, 483, 484, 485, 486, 488, 489, 490, 491, 493, 494, 495, 496, 498, 624, 626, 703 }

Mupad

A grade { }

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

C grade { }

F normal fail { }

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

F(-2) exception fail { }

Sympy

A grade { 1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 21, 22, 23, 25, 27, 99, 100, 101, 102, 103, 104, 105, 156, 157, 158, 160, 165, 166, 167, 169, 174, 175, 176, 178, 264, 265, 266, 267, 268, 289, 290, 291, 303, 304, 305, 306, 307, 346, 430, 596, 597, 598, 599, 600, 602, 604, 605, 606, 607, 608, 609, 611, 613, 614, 615, 616, 617, 618, 620, 622, 623, 659, 660, 661, 662 }

B grade { 159, 168, 177, 501 }

C grade { 354, 413 }

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

F(-1) timedout fail { 50, 51, 68, 75, 76, 77, 78, 84, 85, 86, 90, 91, 92, 93, 94, 96, 149, 150, 205, 226, 227, 229, 282, 283, 398, 447, 451, 452, 453, 454, 460, 465, 471, 476, 480, 481, 487, 488, 489, 491, 492, 493, 494, 495, 496, 504, 510, 516, 517, 518, 519, 520, 521, 522, 528, 533, 534, 538, 539, 540, 546, 547, 552, 553, 554, 555, 556, 557, 558, 564, 569, 570, 574, 575, 581, 582, 583, 584, 585, 586, 645, 653, 658, 681, 703 }

F(-2) exception fail { 113, 238 }

2.2 Detailed conclusion table per each integral for all CAS systems

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

In this table, the column `N.S.` means **normalized size** and is defined as $\frac{\text{antiderivative leaf size}}{\text{optimal antiderivative leaf size}}$. To make the table fit the page, the name `Mathematica` was abbreviated to `MMA`.

Problem 1	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	128	87	126	189	101	151	195	0
N.S.	1	1.00	0.68	0.98	1.48	0.79	1.18	1.52	0.00
time (sec)	N/A	0.075	0.107	0.055	0.293	0.247	0.616	0.283	0.000

Problem 2	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	123	123	89	114	169	96	138	144	0
N.S.	1	1.00	0.72	0.93	1.37	0.78	1.12	1.17	0.00
time (sec)	N/A	0.061	0.069	0.036	0.322	0.254	0.486	0.281	0.000

Problem 3	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	105	105	85	106	148	91	126	142	0
N.S.	1	1.00	0.81	1.01	1.41	0.87	1.20	1.35	0.00
time (sec)	N/A	0.063	0.070	0.044	0.289	0.255	0.350	0.282	0.000

Problem 4	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	90	90	77	92	128	86	117	100	0
N.S.	1	1.00	0.86	1.02	1.42	0.96	1.30	1.11	0.00
time (sec)	N/A	0.026	0.063	0.068	0.279	0.261	0.296	0.274	0.000

Problem 5	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	77	77	88	80	97	71	90	80	0
N.S.	1	1.00	1.14	1.04	1.26	0.92	1.17	1.04	0.00
time (sec)	N/A	0.039	0.050	0.014	0.308	0.253	0.139	0.272	0.000

Problem 6	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	115	157	0	0	0	0	0
N.S.	1	1.00	0.95	1.30	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.074	0.109	0.144	0.000	0.000	0.000	0.000	0.000

Problem 7	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	69	69	78	64	82	98	82	856	71
N.S.	1	1.00	1.13	0.93	1.19	1.42	1.19	12.41	1.03
time (sec)	N/A	0.051	0.025	0.016	0.290	0.276	1.798	1.097	0.252

Problem 8	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	139	139	112	172	0	0	0	0	0
N.S.	1	1.00	0.81	1.24	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.078	0.089	0.132	0.000	0.000	0.000	0.000	0.000

Problem 9	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	81	81	93	87	123	109	177	296	0
N.S.	1	1.00	1.15	1.07	1.52	1.35	2.19	3.65	0.00
time (sec)	N/A	0.051	0.034	0.020	0.292	0.273	3.019	4.563	0.000

Problem 10	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	186	186	119	168	328	153	230	284	0
N.S.	1	1.00	0.64	0.90	1.76	0.82	1.24	1.53	0.00
time (sec)	N/A	0.128	0.090	0.083	0.289	0.255	1.130	0.285	0.000

Problem 11	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	184	184	115	156	298	149	218	205	0
N.S.	1	1.00	0.62	0.85	1.62	0.81	1.18	1.11	0.00
time (sec)	N/A	0.106	0.073	0.066	0.279	0.257	0.850	0.290	0.000

Problem 12	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	161	111	148	267	141	202	227	0
N.S.	1	1.00	0.69	0.92	1.66	0.88	1.25	1.41	0.00
time (sec)	N/A	0.104	0.070	0.072	0.283	0.256	0.609	0.288	0.000

Problem 13	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	94	127	237	137	190	157	0
N.S.	1	1.00	0.76	1.02	1.91	1.10	1.53	1.27	0.00
time (sec)	N/A	0.039	0.051	0.109	0.286	0.254	0.488	0.289	0.000

Problem 14	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	131	131	95	119	196	121	165	158	0
N.S.	1	1.00	0.73	0.91	1.50	0.92	1.26	1.21	0.00
time (sec)	N/A	0.061	0.075	0.087	0.282	0.254	0.293	0.280	0.000

Problem 15	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	184	184	166	185	0	0	0	0	0
N.S.	1	1.00	0.90	1.01	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.123	0.435	0.126	0.000	0.000	0.000	0.000	0.000

Problem 16	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	123	123	126	115	160	152	184	2717	0
N.S.	1	1.00	1.02	0.93	1.30	1.24	1.50	22.09	0.00
time (sec)	N/A	0.093	0.075	0.056	0.280	0.290	2.256	6.340	0.000

Problem 17	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	201	201	185	258	0	0	0	0	0
N.S.	1	1.00	0.92	1.28	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.131	0.165	0.183	0.000	0.000	0.000	0.000	0.000

Problem 18	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	128	136	113	170	162	233	1409	0
N.S.	1	1.00	1.06	0.88	1.33	1.27	1.82	11.01	0.00
time (sec)	N/A	0.100	0.070	0.062	0.296	0.277	3.220	59.118	0.000

Problem 19	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	232	232	143	210	479	189	289	353	0
N.S.	1	1.00	0.62	0.91	2.06	0.81	1.25	1.52	0.00
time (sec)	N/A	0.176	0.136	0.092	0.306	0.252	2.155	0.304	0.000

Problem 20	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	206	139	198	439	185	280	250	0
N.S.	1	1.00	0.67	0.96	2.13	0.90	1.36	1.21	0.00
time (sec)	N/A	0.107	0.139	0.079	0.296	0.251	1.533	0.302	0.000

Problem 21	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	207	207	135	190	398	177	265	296	0
N.S.	1	1.00	0.65	0.92	1.92	0.86	1.28	1.43	0.00
time (sec)	N/A	0.151	0.119	0.107	0.278	0.267	1.120	0.297	0.000

Problem 22	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	110	160	358	173	253	202	0
N.S.	1	1.00	0.73	1.07	2.39	1.15	1.69	1.35	0.00
time (sec)	N/A	0.045	0.052	0.073	0.291	0.262	0.864	0.289	0.000

Problem 23	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	175	175	119	162	307	157	221	224	0
N.S.	1	1.00	0.68	0.93	1.75	0.90	1.26	1.28	0.00
time (sec)	N/A	0.104	0.141	0.082	0.287	0.251	0.556	0.284	0.000

Problem 24	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	235	235	207	221	0	0	0	0	0
N.S.	1	1.00	0.88	0.94	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.180	0.547	0.154	0.000	0.000	0.000	0.000	0.000

Problem 25	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	164	164	123	152	250	188	291	5513	0
N.S.	1	1.00	0.75	0.93	1.52	1.15	1.77	33.62	0.00
time (sec)	N/A	0.136	0.161	0.052	0.282	0.299	3.068	29.090	0.000

Problem 26	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	263	263	226	293	0	0	0	0	0
N.S.	1	1.00	0.86	1.11	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.186	0.366	0.213	0.000	0.000	0.000	0.000	0.000

Problem 27	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	178	178	162	159	242	196	326	0	0
N.S.	1	1.00	0.91	0.89	1.36	1.10	1.83	0.00	0.00
time (sec)	N/A	0.150	0.143	0.058	0.296	0.296	3.894	0.000	0.000

Problem 28	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	172	172	286	229	0	0	0	0	0
N.S.	1	1.00	1.66	1.33	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.154	0.912	0.206	0.000	0.000	0.000	0.000	0.000

Problem 29	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	312	160	0	0	0	0	0
N.S.	1	1.00	2.17	1.11	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.120	0.431	0.265	0.000	0.000	0.000	0.000	0.000

Problem 30	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	238	191	0	0	0	0	0
N.S.	1	1.00	1.92	1.54	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.089	0.488	0.126	0.000	0.000	0.000	0.000	0.000

Problem 31	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	244	95	0	0	0	0	0
N.S.	1	1.00	2.98	1.16	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.066	0.313	0.117	0.000	0.000	0.000	0.000	0.000

Problem 32	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	84	84	207	140	0	0	0	0	0
N.S.	1	1.00	2.46	1.67	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.039	0.272	0.270	0.000	0.000	0.000	0.000	0.000

Problem 33	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	71	71	274	193	0	0	0	0	0
N.S.	1	1.00	3.86	2.72	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.071	0.184	0.127	0.000	0.000	0.000	0.000	0.000

Problem 34	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	259	204	0	0	0	0	0
N.S.	1	1.00	2.23	1.76	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.096	0.706	0.230	0.000	0.000	0.000	0.000	0.000

Problem 35	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	392	244	0	0	0	0	0
N.S.	1	1.00	3.16	1.97	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.116	0.227	0.181	0.000	0.000	0.000	0.000	0.000

Problem 36	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	173	173	350	250	0	0	0	0	0
N.S.	1	1.00	2.02	1.45	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.160	0.479	0.257	0.000	0.000	0.000	0.000	0.000

Problem 37	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	187	187	332	259	0	0	0	0	0
N.S.	1	1.00	1.78	1.39	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.151	0.583	0.217	0.000	0.000	0.000	0.000	0.000

Problem 38	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	155	155	334	161	0	0	0	0	0
N.S.	1	1.00	2.15	1.04	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.115	0.566	0.141	0.000	0.000	0.000	0.000	0.000

Problem 39	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	463	201	0	0	0	0	0
N.S.	1	1.00	3.22	1.40	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.086	0.412	0.160	0.000	0.000	0.000	0.000	0.000

Problem 40	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	50	98	136	55	0	89	0
N.S.	1	1.00	0.88	1.72	2.39	0.96	0.00	1.56	0.00
time (sec)	N/A	0.029	0.031	0.099	0.282	0.254	0.000	0.306	0.000

Problem 41	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	141	141	334	201	0	0	0	0	0
N.S.	1	1.00	2.37	1.43	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.062	0.684	0.171	0.000	0.000	0.000	0.000	0.000

Problem 42	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	122	122	364	251	0	0	0	0	0
N.S.	1	1.00	2.98	2.06	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.116	0.566	0.175	0.000	0.000	0.000	0.000	0.000

Problem 43	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	186	186	348	268	0	0	0	0	0
N.S.	1	1.00	1.87	1.44	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.128	1.091	0.263	0.000	0.000	0.000	0.000	0.000

Problem 44	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	159	159	461	278	0	0	0	0	0
N.S.	1	1.00	2.90	1.75	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.167	0.801	0.237	0.000	0.000	0.000	0.000	0.000

Problem 45	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	259	259	426	312	0	0	0	0	0
N.S.	1	1.00	1.64	1.20	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.200	1.161	0.306	0.000	0.000	0.000	0.000	0.000

Problem 46	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	204	204	445	262	0	0	0	0	0
N.S.	1	1.00	2.18	1.28	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.155	0.843	0.236	0.000	0.000	0.000	0.000	0.000

Problem 47	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	100	100	79	212	0	91	0	124	0
N.S.	1	1.00	0.79	2.12	0.00	0.91	0.00	1.24	0.00
time (sec)	N/A	0.054	0.165	0.111	0.000	0.248	0.000	0.302	0.000

Problem 48	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	202	202	445	260	0	0	0	0	0
N.S.	1	1.00	2.20	1.29	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.116	0.900	0.220	0.000	0.000	0.000	0.000	0.000

Problem 49	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	83	62	151	0	88	0	172	0
N.S.	1	1.00	0.75	1.82	0.00	1.06	0.00	2.07	0.00
time (sec)	N/A	0.034	0.071	0.065	0.000	0.259	0.000	0.304	0.000

Problem 50	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	196	196	501	262	0	0	0	0	0
N.S.	1	1.00	2.56	1.34	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.089	1.137	0.240	0.000	0.000	0.000	0.000	0.000

Problem 51	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	173	173	524	325	0	0	0	0	0
N.S.	1	1.00	3.03	1.88	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.162	0.862	0.235	0.000	0.000	0.000	0.000	0.000

Problem 52	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	242	242	512	327	0	0	0	0	0
N.S.	1	1.00	2.12	1.35	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.167	1.671	0.301	0.000	0.000	0.000	0.000	0.000

Problem 53	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	248	248	568	385	0	0	0	0	0
N.S.	1	1.00	2.29	1.55	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.224	1.394	0.309	0.000	0.000	0.000	0.000	0.000

Problem 54	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	317	317	587	372	0	0	0	0	0
N.S.	1	1.00	1.85	1.17	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.249	1.796	0.382	0.000	0.000	0.000	0.000	0.000

Problem 55	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	262	262	169	673	0	0	0	0	0
N.S.	1	1.00	0.65	2.57	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.180	0.087	0.208	0.000	0.000	0.000	0.000	0.000

Problem 56	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	189	189	140	367	0	0	0	0	0
N.S.	1	1.00	0.74	1.94	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.126	0.067	0.125	0.000	0.000	0.000	0.000	0.000

Problem 57	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	111	280	0	0	0	0	0
N.S.	1	1.00	0.96	2.41	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.038	0.037	0.115	0.000	0.000	0.000	0.000	0.000

Problem 58	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	110	110	142	298	0	0	0	0	0
N.S.	1	1.00	1.29	2.71	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.073	0.301	0.152	0.000	0.000	0.000	0.000	0.000

Problem 59	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	B	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	111	111	122	158	137	414	0	0	0
N.S.	1	1.00	1.10	1.42	1.23	3.73	0.00	0.00	0.00
time (sec)	N/A	0.060	0.353	0.171	0.299	0.292	0.000	0.000	0.000

Problem 60	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	187	187	172	1903	140	501	0	0	0
N.S.	1	1.00	0.92	10.18	0.75	2.68	0.00	0.00	0.00
time (sec)	N/A	0.077	0.225	0.217	0.287	0.298	0.000	0.000	0.000

Problem 61	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	263	263	213	2751	199	567	0	0	0
N.S.	1	1.00	0.81	10.46	0.76	2.16	0.00	0.00	0.00
time (sec)	N/A	0.092	0.254	0.249	0.279	0.310	0.000	0.000	0.000

Problem 62	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	256	256	157	880	197	177	0	0	0
N.S.	1	1.00	0.61	3.44	0.77	0.69	0.00	0.00	0.00
time (sec)	N/A	0.106	0.111	0.244	0.272	0.260	0.000	0.000	0.000

Problem 63	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	183	134	544	138	150	0	0	0
N.S.	1	1.00	0.73	2.97	0.75	0.82	0.00	0.00	0.00
time (sec)	N/A	0.087	0.066	0.361	0.293	0.255	0.000	0.000	0.000

Problem 64	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	110	110	70	343	75	116	0	0	0
N.S.	1	1.00	0.64	3.12	0.68	1.05	0.00	0.00	0.00
time (sec)	N/A	0.041	0.058	0.125	0.283	0.263	0.000	0.000	0.000

Problem 65	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	203	203	187	314	0	0	0	0	0
N.S.	1	1.00	0.92	1.55	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.129	0.401	0.128	0.000	0.000	0.000	0.000	0.000

Problem 66	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	225	225	239	289	0	0	0	0	0
N.S.	1	1.00	1.06	1.28	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.125	1.684	0.166	0.000	0.000	0.000	0.000	0.000

Problem 67	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	301	301	321	349	0	0	0	0	0
N.S.	1	1.00	1.07	1.16	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.179	3.231	0.194	0.000	0.000	0.000	0.000	0.000

Problem 68	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	340	340	193	770	0	0	0	0	0
N.S.	1	1.00	0.57	2.26	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.258	0.129	0.165	0.000	0.000	0.000	0.000	0.000

Problem 69	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	265	265	170	682	0	0	0	0	0
N.S.	1	1.00	0.64	2.57	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.206	0.106	0.154	0.000	0.000	0.000	0.000	0.000

Problem 70	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	188	188	210	480	0	0	0	0	0
N.S.	1	1.00	1.12	2.55	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.072	0.500	0.126	0.000	0.000	0.000	0.000	0.000

Problem 71	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	185	185	222	248	0	0	0	0	0
N.S.	1	1.00	1.20	1.34	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.111	0.476	0.160	0.000	0.000	0.000	0.000	0.000

Problem 72	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	191	191	211	276	0	0	0	0	0
N.S.	1	1.00	1.10	1.45	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.142	0.637	0.191	0.000	0.000	0.000	0.000	0.000

Problem 73	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	154	154	156	2350	172	525	0	0	0
N.S.	1	1.00	1.01	15.26	1.12	3.41	0.00	0.00	0.00
time (sec)	N/A	0.072	0.232	0.216	0.294	0.321	0.000	0.000	0.000

Problem 74	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	231	231	198	3384	151	599	0	0	0
N.S.	1	1.00	0.86	14.65	0.65	2.59	0.00	0.00	0.00
time (sec)	N/A	0.100	0.281	0.250	0.331	0.322	0.000	0.000	0.000

Problem 75	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	308	308	238	4563	210	671	0	0	0
N.S.	1	1.00	0.77	14.81	0.68	2.18	0.00	0.00	0.00
time (sec)	N/A	0.117	0.377	0.296	0.293	0.328	0.000	0.000	0.000

Problem 76	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	385	385	278	5886	269	743	0	0	0
N.S.	1	1.00	0.72	15.29	0.70	1.93	0.00	0.00	0.00
time (sec)	N/A	0.165	0.350	0.394	0.281	0.346	0.000	0.000	0.000

Problem 77	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	375	375	174	1781	267	249	0	0	0
N.S.	1	1.00	0.46	4.75	0.71	0.66	0.00	0.00	0.00
time (sec)	N/A	0.150	0.125	0.340	0.291	0.261	0.000	0.000	0.000

Problem 78	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	301	301	150	1254	208	219	0	0	0
N.S.	1	1.00	0.50	4.17	0.69	0.73	0.00	0.00	0.00
time (sec)	N/A	0.129	0.112	0.283	0.286	0.271	0.000	0.000	0.000

Problem 79	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	227	227	126	727	149	189	0	0	0
N.S.	1	1.00	0.56	3.20	0.66	0.83	0.00	0.00	0.00
time (sec)	N/A	0.105	0.094	0.167	0.292	0.259	0.000	0.000	0.000

Problem 80	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	153	153	84	524	87	159	0	0	0
N.S.	1	1.00	0.55	3.42	0.57	1.04	0.00	0.00	0.00
time (sec)	N/A	0.048	0.045	0.240	0.290	0.254	0.000	0.000	0.000

Problem 81	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	278	278	278	525	0	0	0	0	0
N.S.	1	1.00	1.00	1.89	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.210	0.838	0.165	0.000	0.000	0.000	0.000	0.000

Problem 82	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	297	297	389	437	0	0	0	0	0
N.S.	1	1.00	1.31	1.47	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.204	1.584	0.174	0.000	0.000	0.000	0.000	0.000

Problem 83	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	307	307	494	371	0	0	0	0	0
N.S.	1	1.00	1.61	1.21	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.210	4.567	0.198	0.000	0.000	0.000	0.000	0.000

Problem 84	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	430	430	220	1106	0	0	0	0	0
N.S.	1	1.00	0.51	2.57	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.352	0.162	0.205	0.000	0.000	0.000	0.000	0.000

Problem 85	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	351	351	196	907	0	0	0	0	0
N.S.	1	1.00	0.56	2.58	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.287	0.145	0.178	0.000	0.000	0.000	0.000	0.000

Problem 86	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	265	265	266	691	0	0	0	0	0
N.S.	1	1.00	1.00	2.61	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.104	0.801	0.158	0.000	0.000	0.000	0.000	0.000

Problem 87	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	268	268	257	306	0	0	0	0	0
N.S.	1	1.00	0.96	1.14	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.155	0.753	0.207	0.000	0.000	0.000	0.000	0.000

Problem 88	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	277	277	243	343	0	0	0	0	0
N.S.	1	1.00	0.88	1.24	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.194	1.077	0.205	0.000	0.000	0.000	0.000	0.000

Problem 89	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	277	277	234	2615	0	0	0	0	0
N.S.	1	1.00	0.84	9.44	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.231	1.103	0.244	0.000	0.000	0.000	0.000	0.000

Problem 90	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	203	203	190	4031	205	655	0	0	0
N.S.	1	1.00	0.94	19.86	1.01	3.23	0.00	0.00	0.00
time (sec)	N/A	0.079	0.305	0.270	0.316	0.313	0.000	0.000	0.000

Problem 91	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	282	282	232	5324	162	747	0	0	0
N.S.	1	1.00	0.82	18.88	0.57	2.65	0.00	0.00	0.00
time (sec)	N/A	0.109	0.313	0.323	0.326	0.340	0.000	0.000	0.000

Problem 92	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	361	361	272	6761	221	831	0	0	0
N.S.	1	1.00	0.75	18.73	0.61	2.30	0.00	0.00	0.00
time (sec)	N/A	0.140	0.357	0.419	0.304	0.356	0.000	0.000	0.000

Problem 93	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	354	354	160	1644	219	291	0	0	0
N.S.	1	1.00	0.45	4.64	0.62	0.82	0.00	0.00	0.00
time (sec)	N/A	0.132	0.132	0.310	0.291	0.268	0.000	0.000	0.000

Problem 94	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	278	278	137	1063	160	255	0	0	0
N.S.	1	1.00	0.49	3.82	0.58	0.92	0.00	0.00	0.00
time (sec)	N/A	0.110	0.115	0.249	0.284	0.259	0.000	0.000	0.000

Problem 95	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	202	202	93	717	98	215	0	0	0
N.S.	1	1.00	0.46	3.55	0.49	1.06	0.00	0.00	0.00
time (sec)	N/A	0.053	0.052	0.217	0.307	0.256	0.000	0.000	0.000

Problem 96	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	361	361	394	652	0	0	0	0	0
N.S.	1	1.00	1.09	1.81	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.284	1.365	0.211	0.000	0.000	0.000	0.000	0.000

Problem 97	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	386	386	484	659	0	0	0	0	0
N.S.	1	1.00	1.25	1.71	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.285	3.279	0.203	0.000	0.000	0.000	0.000	0.000

Problem 98	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	389	389	640	529	0	0	0	0	0
N.S.	1	1.00	1.65	1.36	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.293	4.903	0.220	0.000	0.000	0.000	0.000	0.000

Problem 99	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	34	34	30	31	30	26	31	27	0
N.S.	1	1.00	0.88	0.91	0.88	0.76	0.91	0.79	0.00
time (sec)	N/A	0.019	0.011	0.124	0.266	0.246	0.536	0.292	0.000

Problem 100	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	A	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	68	68	87	97	0	0	92	0	0
N.S.	1	1.00	1.28	1.43	0.00	0.00	1.35	0.00	0.00
time (sec)	N/A	0.037	0.035	0.111	0.000	0.000	4.809	0.000	0.000

Problem 101	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	88	88	64	76	85	60	82	91	0
N.S.	1	1.00	0.73	0.86	0.97	0.68	0.93	1.03	0.00
time (sec)	N/A	0.091	0.027	0.142	0.280	0.258	0.404	0.317	0.000

Problem 102	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	72	72	49	95	61	44	65	0	0
N.S.	1	1.00	0.68	1.32	0.85	0.61	0.90	0.00	0.00
time (sec)	N/A	0.063	0.021	0.106	0.275	0.248	0.306	0.000	0.000

Problem 103	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	50	50	43	40	56	39	42	53	0
N.S.	1	1.00	0.86	0.80	1.12	0.78	0.84	1.06	0.00
time (sec)	N/A	0.051	0.011	0.108	0.273	0.251	0.264	0.304	0.000

Problem 104	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	29	29	29	62	27	26	24	27	0
N.S.	1	1.00	1.00	2.14	0.93	0.90	0.83	0.93	0.00
time (sec)	N/A	0.026	0.009	0.103	0.275	0.249	0.213	0.294	0.000

Problem 105	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	11	11	10	11	11
N.S.	1	1.00	1.00	0.92	0.85	0.85	0.77	0.85	0.85
time (sec)	N/A	0.013	0.006	0.074	0.273	0.243	0.189	0.291	0.149

Problem 106	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	52	52	71	103	0	0	0	0	0
N.S.	1	1.00	1.37	1.98	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.052	0.100	0.087	0.000	0.000	0.000	0.000	0.000

Problem 107	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	28	28	28	32	26	28	0	67	0
N.S.	1	1.00	1.00	1.14	0.93	1.00	0.00	2.39	0.00
time (sec)	N/A	0.036	0.017	0.111	0.294	0.254	0.000	0.304	0.000

Problem 108	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	98	98	137	171	0	0	0	0	0
N.S.	1	1.00	1.40	1.74	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.096	0.695	0.318	0.000	0.000	0.000	0.000	0.000

Problem 109	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	224	224	119	521	180	150	0	0	0
N.S.	1	1.00	0.53	2.33	0.80	0.67	0.00	0.00	0.00
time (sec)	N/A	0.172	0.048	0.219	0.288	0.267	0.000	0.000	0.000

Problem 110	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	200	200	161	377	0	0	0	0	0
N.S.	1	1.00	0.80	1.88	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.149	0.981	0.139	0.000	0.000	0.000	0.000	0.000

Problem 111	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	148	148	92	407	121	120	0	0	0
N.S.	1	1.00	0.62	2.75	0.82	0.81	0.00	0.00	0.00
time (sec)	N/A	0.104	0.035	0.211	0.302	0.268	0.000	0.000	0.000

Problem 112	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	134	268	0	0	0	0	0
N.S.	1	1.00	1.08	2.16	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.084	0.965	0.116	0.000	0.000	0.000	0.000	0.000

Problem 113	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	67	67	64	159	58	92	0	0	0
N.S.	1	1.00	0.96	2.37	0.87	1.37	0.00	0.00	0.00
time (sec)	N/A	0.039	0.023	0.108	0.285	0.253	0.000	0.000	0.000

Problem 114	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	49	49	50	86	28	0	0	0	0
N.S.	1	1.00	1.02	1.76	0.57	0.00	0.00	0.00	0.00
time (sec)	N/A	0.021	0.068	0.114	0.272	0.000	0.000	0.000	0.000

Problem 115	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	145	145	146	180	0	0	0	0	0
N.S.	1	1.00	1.01	1.24	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.084	0.270	0.109	0.000	0.000	0.000	0.000	0.000

Problem 116	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	66	66	81	204	104	218	0	0	0
N.S.	1	1.00	1.23	3.09	1.58	3.30	0.00	0.00	0.00
time (sec)	N/A	0.057	0.186	0.138	0.288	0.287	0.000	0.000	0.000

Problem 117	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	229	229	244	277	0	0	0	0	0
N.S.	1	1.00	1.07	1.21	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.150	1.745	0.161	0.000	0.000	0.000	0.000	0.000

Problem 118	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	147	147	135	850	124	433	0	0	0
N.S.	1	1.00	0.92	5.78	0.84	2.95	0.00	0.00	0.00
time (sec)	N/A	0.121	0.197	0.169	0.285	0.298	0.000	0.000	0.000

Problem 119	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	C	F	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	221	221	166	425	0	441	0	0	0
N.S.	1	1.00	0.75	1.92	0.00	2.00	0.00	0.00	0.00
time (sec)	N/A	0.126	0.231	0.340	0.000	0.307	0.000	0.000	0.000

Problem 120	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	214	214	173	432	0	0	0	0	0
N.S.	1	1.00	0.81	2.02	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.171	0.489	0.163	0.000	0.000	0.000	0.000	0.000

Problem 121	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	142	142	136	307	142	382	0	0	0
N.S.	1	1.00	0.96	2.16	1.00	2.69	0.00	0.00	0.00
time (sec)	N/A	0.097	0.173	0.247	0.308	0.300	0.000	0.000	0.000

Problem 122	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	160	274	0	0	0	0	0
N.S.	1	1.00	1.19	2.03	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.093	0.209	0.129	0.000	0.000	0.000	0.000	0.000

Problem 123	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	73	73	51	194	0	279	0	0	0
N.S.	1	1.00	0.70	2.66	0.00	3.82	0.00	0.00	0.00
time (sec)	N/A	0.043	0.023	0.121	0.000	0.283	0.000	0.000	0.000

Problem 124	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	80	77	177	62	0	0	0	0
N.S.	1	1.00	0.96	2.21	0.78	0.00	0.00	0.00	0.00
time (sec)	N/A	0.023	0.177	0.124	0.276	0.000	0.000	0.000	0.000

Problem 125	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	220	220	300	224	0	0	0	0	0
N.S.	1	1.00	1.36	1.02	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.160	0.745	0.159	0.000	0.000	0.000	0.000	0.000

Problem 126	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	171	229	129	0	0	0	0
N.S.	1	1.00	1.14	1.53	0.86	0.00	0.00	0.00	0.00
time (sec)	N/A	0.093	0.407	0.146	0.301	0.000	0.000	0.000	0.000

Problem 127	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	316	316	404	425	0	0	0	0	0
N.S.	1	1.00	1.28	1.34	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.242	1.633	0.214	0.000	0.000	0.000	0.000	0.000

Problem 128	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	238	238	224	1048	0	0	0	0	0
N.S.	1	1.00	0.94	4.40	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.122	0.595	0.207	0.000	0.000	0.000	0.000	0.000

Problem 129	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	293	293	253	426	0	0	0	0	0
N.S.	1	1.00	0.86	1.45	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.264	0.543	0.231	0.000	0.000	0.000	0.000	0.000

Problem 130	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	C	F	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	219	219	169	414	0	481	0	0	0
N.S.	1	1.00	0.77	1.89	0.00	2.20	0.00	0.00	0.00
time (sec)	N/A	0.125	0.245	0.336	0.000	0.319	0.000	0.000	0.000

Problem 131	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	212	212	213	359	0	0	0	0	0
N.S.	1	1.00	1.00	1.69	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.175	0.398	0.197	0.000	0.000	0.000	0.000	0.000

Problem 132	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	143	252	160	421	0	0	0
N.S.	1	1.00	0.95	1.68	1.07	2.81	0.00	0.00	0.00
time (sec)	N/A	0.104	0.183	0.129	0.312	0.287	0.000	0.000	0.000

Problem 133	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	125	125	103	1242	153	0	0	0	0
N.S.	1	1.00	0.82	9.94	1.22	0.00	0.00	0.00	0.00
time (sec)	N/A	0.082	0.138	0.176	0.303	0.000	0.000	0.000	0.000

Problem 134	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	119	119	85	223	0	374	0	0	0
N.S.	1	1.00	0.71	1.87	0.00	3.14	0.00	0.00	0.00
time (sec)	N/A	0.050	0.037	0.156	0.000	0.285	0.000	0.000	0.000

Problem 135	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	154	154	113	1072	141	0	0	0	0
N.S.	1	1.00	0.73	6.96	0.92	0.00	0.00	0.00	0.00
time (sec)	N/A	0.052	0.195	0.158	0.295	0.000	0.000	0.000	0.000

Problem 136	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	291	291	456	512	0	0	0	0	0
N.S.	1	1.00	1.57	1.76	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.235	1.355	0.223	0.000	0.000	0.000	0.000	0.000

Problem 137	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	224	224	238	1346	0	0	0	0	0
N.S.	1	1.00	1.06	6.01	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.122	0.507	0.206	0.000	0.000	0.000	0.000	0.000

Problem 138	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	433	433	537	605	0	0	0	0	0
N.S.	1	1.00	1.24	1.40	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.332	7.354	0.269	0.000	0.000	0.000	0.000	0.000

Problem 139	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	310	310	277	1877	255	0	0	0	0
N.S.	1	1.00	0.89	6.05	0.82	0.00	0.00	0.00	0.00
time (sec)	N/A	0.169	0.356	0.213	0.303	0.000	0.000	0.000	0.000

Problem 140	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	210	210	111	409	149	0	0	128	0
N.S.	1	1.00	0.53	1.95	0.71	0.00	0.00	0.61	0.00
time (sec)	N/A	0.078	0.157	0.289	0.296	0.000	0.000	0.351	0.000

Problem 141	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	79	79	68	0	0	0	0	0	0
N.S.	1	1.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.060	0.039	0.000	0.000	0.000	0.000	0.000	0.000

Problem 142	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	137	137	97	0	0	0	0	0	0
N.S.	1	1.00	0.71	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.073	0.036	0.000	0.000	0.000	0.000	0.000	0.000

Problem 143	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	315	315	256	0	0	0	0	0	0
N.S.	1	1.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.267	0.320	0.000	0.000	0.000	0.000	0.000	0.000

Problem 144	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	217	217	187	0	0	0	0	0	0
N.S.	1	1.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.190	0.014	0.000	0.000	0.000	0.000	0.000	0.000

Problem 145	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	129	129	118	0	0	0	0	0	0
N.S.	1	1.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.091	0.039	0.000	0.000	0.000	0.000	0.000	0.000

Problem 146	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	25	30	29	37	29	27
N.S.	1	1.00	1.08	1.00	1.20	1.16	1.48	1.16	1.08
time (sec)	N/A	0.040	3.889	0.409	0.569	0.258	2.740	0.585	0.331

Problem 147	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	25	28	41	54	28	27
N.S.	1	1.00	1.08	1.00	1.12	1.64	2.16	1.12	1.08
time (sec)	N/A	0.095	5.783	0.404	0.557	0.270	16.344	0.607	0.329

Problem 148	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	25	30	55	73	29	27
N.S.	1	1.00	1.08	1.00	1.20	2.20	2.92	1.16	1.08
time (sec)	N/A	0.154	6.477	0.307	0.583	0.258	116.999	0.630	0.342

Problem 149	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	635	635	338	0	0	0	0	0	0
N.S.	1	1.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.344	0.826	0.000	0.000	0.000	0.000	0.000	0.000

Problem 150	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	399	399	237	0	0	0	0	0	0
N.S.	1	1.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.200	0.369	0.000	0.000	0.000	0.000	0.000	0.000

Problem 151	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	245	245	181	0	0	0	0	0	0
N.S.	1	1.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.124	0.050	0.000	0.000	0.000	0.000	0.000	0.000

Problem 152	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	163	163	129	0	0	0	0	0	0
N.S.	1	1.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.070	0.049	0.000	0.000	0.000	0.000	0.000	0.000

Problem 153	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	272	272	207	0	0	0	0	0	0
N.S.	1	1.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.151	0.166	0.000	0.000	0.000	0.000	0.000	0.000

Problem 154	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	408	408	279	0	0	0	0	0	0
N.S.	1	1.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.247	0.246	0.000	0.000	0.000	0.000	0.000	0.000

Problem 155	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	100	100	95	0	0	0	0	0	0
N.S.	1	1.00	0.95	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.048	0.028	0.000	0.000	0.000	0.000	0.000	0.000

Problem 156	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	290	290	203	275	453	229	388	495	0
N.S.	1	1.00	0.70	0.95	1.56	0.79	1.34	1.71	0.00
time (sec)	N/A	0.286	0.180	0.242	0.287	0.278	0.880	0.342	0.000

Problem 157	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	202	202	192	330	0	211	332	377	0
N.S.	1	1.00	0.95	1.63	0.00	1.04	1.64	1.87	0.00
time (sec)	N/A	0.348	0.105	0.108	0.000	0.249	0.659	0.332	0.000

Problem 158	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	211	211	179	279	354	194	313	356	0
N.S.	1	1.00	0.85	1.32	1.68	0.92	1.48	1.69	0.00
time (sec)	N/A	0.209	0.150	0.325	0.281	0.257	0.490	0.320	0.000

Problem 159	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	138	138	165	192	0	176	269	248	0
N.S.	1	1.00	1.20	1.39	0.00	1.28	1.95	1.80	0.00
time (sec)	N/A	0.087	0.168	0.217	0.000	0.273	0.400	0.327	0.000

Problem 160	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	128	137	173	233	146	224	196	0
N.S.	1	1.00	1.07	1.35	1.82	1.14	1.75	1.53	0.00
time (sec)	N/A	0.088	0.129	0.063	0.276	0.247	0.204	0.330	0.000

Problem 161	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	178	178	256	368	0	0	0	0	0
N.S.	1	1.00	1.44	2.07	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.153	0.415	0.201	0.000	0.000	0.000	0.000	0.000

Problem 162	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	149	149	203	250	0	0	0	0	0
N.S.	1	1.00	1.36	1.68	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.195	0.354	0.167	0.000	0.000	0.000	0.000	0.000

Problem 163	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	193	193	236	458	0	0	0	0	0
N.S.	1	1.00	1.22	2.37	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.183	0.344	0.262	0.000	0.000	0.000	0.000	0.000

Problem 164	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	176	176	266	261	0	0	0	0	0
N.S.	1	1.00	1.51	1.48	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.244	0.629	0.185	0.000	0.000	0.000	0.000	0.000

Problem 165	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	395	395	253	530	781	337	563	702	0
N.S.	1	1.00	0.64	1.34	1.98	0.85	1.43	1.78	0.00
time (sec)	N/A	0.467	0.147	0.383	0.297	0.258	1.625	0.359	0.000

Problem 166	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	302	302	239	423	0	319	515	522	0
N.S.	1	1.00	0.79	1.40	0.00	1.06	1.71	1.73	0.00
time (sec)	N/A	0.647	0.157	0.293	0.000	0.260	1.244	0.340	0.000

Problem 167	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	310	310	229	399	634	296	483	553	0
N.S.	1	1.00	0.74	1.29	2.05	0.95	1.56	1.78	0.00
time (sec)	N/A	0.369	0.132	0.131	0.308	0.261	0.900	0.339	0.000

Problem 168	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	209	209	218	270	0	278	430	383	0
N.S.	1	1.00	1.04	1.29	0.00	1.33	2.06	1.83	0.00
time (sec)	N/A	0.125	0.269	0.162	0.000	0.263	0.692	0.317	0.000

Problem 169	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	219	219	193	275	465	247	389	374	0
N.S.	1	1.00	0.88	1.26	2.12	1.13	1.78	1.71	0.00
time (sec)	N/A	0.163	0.170	0.105	0.289	0.252	0.445	0.337	0.000

Problem 170	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	271	271	371	428	0	0	0	0	0
N.S.	1	1.00	1.37	1.58	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.280	0.446	0.175	0.000	0.000	0.000	0.000	0.000

Problem 171	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	249	249	322	372	0	0	0	0	0
N.S.	1	1.00	1.29	1.49	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.318	1.107	0.167	0.000	0.000	0.000	0.000	0.000

Problem 172	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	287	287	361	640	0	0	0	0	0
N.S.	1	1.00	1.26	2.23	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.314	0.739	0.306	0.000	0.000	0.000	0.000	0.000

Problem 173	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	268	268	374	378	0	0	0	0	0
N.S.	1	1.00	1.40	1.41	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.439	0.635	0.234	0.000	0.000	0.000	0.000	0.000

Problem 174	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	476	476	301	671	1141	413	702	865	0
N.S.	1	1.00	0.63	1.41	2.40	0.87	1.47	1.82	0.00
time (sec)	N/A	0.651	0.266	0.289	0.324	0.285	2.977	0.343	0.000

Problem 175	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	384	384	287	518	0	395	654	631	0
N.S.	1	1.00	0.75	1.35	0.00	1.03	1.70	1.64	0.00
time (sec)	N/A	1.021	0.274	0.237	0.000	0.285	2.350	0.342	0.000

Problem 176	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	391	391	277	524	946	372	626	716	0
N.S.	1	1.00	0.71	1.34	2.42	0.95	1.60	1.83	0.00
time (sec)	N/A	0.523	0.229	0.155	0.317	0.267	1.626	0.342	0.000

Problem 177	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	268	268	257	336	0	354	573	492	0
N.S.	1	1.00	0.96	1.25	0.00	1.32	2.14	1.84	0.00
time (sec)	N/A	0.159	0.330	0.132	0.000	0.263	1.251	0.335	0.000

Problem 178	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	B	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	298	298	241	384	729	323	524	528	0
N.S.	1	1.00	0.81	1.29	2.45	1.08	1.76	1.77	0.00
time (sec)	N/A	0.246	0.269	0.112	0.301	0.262	0.834	0.325	0.000

Problem 179	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	354	354	466	498	0	0	0	0	0
N.S.	1	1.00	1.32	1.41	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.428	0.929	0.204	0.000	0.000	0.000	0.000	0.000

Problem 180	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	329	329	483	416	0	0	0	0	0
N.S.	1	1.00	1.47	1.26	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.462	1.363	0.187	0.000	0.000	0.000	0.000	0.000

Problem 181	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	371	371	556	708	0	0	0	0	0
N.S.	1	1.00	1.50	1.91	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.472	0.560	0.333	0.000	0.000	0.000	0.000	0.000

Problem 182	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	348	348	480	488	0	0	0	0	0
N.S.	1	1.00	1.38	1.40	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.619	0.888	0.266	0.000	0.000	0.000	0.000	0.000

Problem 183	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	297	297	508	0	0	0	0	0	0
N.S.	1	1.00	1.71	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.341	1.012	0.000	0.000	0.000	0.000	0.000	0.000

Problem 184	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	210	210	459	371	0	0	0	0	0
N.S.	1	1.00	2.19	1.77	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.258	0.598	0.417	0.000	0.000	0.000	0.000	0.000

Problem 185	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	218	218	412	0	0	0	0	0	0
N.S.	1	1.00	1.89	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.192	1.075	0.000	0.000	0.000	0.000	0.000	0.000

Problem 186	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	117	117	342	206	0	0	0	0	0
N.S.	1	1.00	2.92	1.76	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.115	0.661	0.124	0.000	0.000	0.000	0.000	0.000

Problem 187	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	156	156	302	375	0	0	0	0	0
N.S.	1	1.00	1.94	2.40	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.082	0.702	0.236	0.000	0.000	0.000	0.000	0.000

Problem 188	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	131	131	453	452	0	0	0	0	0
N.S.	1	1.00	3.46	3.45	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.129	0.476	0.202	0.000	0.000	0.000	0.000	0.000

Problem 189	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	238	238	525	474	0	0	0	0	0
N.S.	1	1.00	2.21	1.99	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.224	1.172	0.356	0.000	0.000	0.000	0.000	0.000

Problem 190	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	210	210	647	610	0	0	0	0	0
N.S.	1	1.00	3.08	2.90	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.250	1.058	0.348	0.000	0.000	0.000	0.000	0.000

Problem 191	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	333	333	849	561	0	0	0	0	0
N.S.	1	1.00	2.55	1.68	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.427	7.442	0.486	0.000	0.000	0.000	0.000	0.000

Problem 192	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	300	300	614	618	0	0	0	0	0
N.S.	1	1.00	2.05	2.06	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.344	2.816	0.354	0.000	0.000	0.000	0.000	0.000

Problem 193	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	227	227	502	364	0	0	0	0	0
N.S.	1	1.00	2.21	1.60	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.263	1.205	0.263	0.000	0.000	0.000	0.000	0.000

Problem 194	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	233	233	457	446	0	0	0	0	0
N.S.	1	1.00	1.96	1.91	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.194	2.030	0.326	0.000	0.000	0.000	0.000	0.000

Problem 195	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	B	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	89	75	172	293	102	0	204	0
N.S.	1	1.00	0.84	1.93	3.29	1.15	0.00	2.29	0.00
time (sec)	N/A	0.066	0.126	0.108	0.304	0.269	0.000	0.320	0.000

Problem 196	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	230	230	458	446	0	0	0	0	0
N.S.	1	1.00	1.99	1.94	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.166	1.884	0.299	0.000	0.000	0.000	0.000	0.000

Problem 197	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	211	211	612	604	0	0	0	0	0
N.S.	1	1.00	2.90	2.86	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.215	1.977	0.298	0.000	0.000	0.000	0.000	0.000

Problem 198	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	324	324	1161	605	0	0	0	0	0
N.S.	1	1.00	3.58	1.87	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.358	10.438	0.445	0.000	0.000	0.000	0.000	0.000

Problem 199	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	270	270	759	661	0	0	0	0	0
N.S.	1	1.00	2.81	2.45	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.375	1.733	0.377	0.000	0.000	0.000	0.000	0.000

Problem 200	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	439	439	1390	707	0	0	0	0	0
N.S.	1	1.00	3.17	1.61	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.635	12.416	0.549	0.000	0.000	0.000	0.000	0.000

Problem 201	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	343	343	667	570	0	0	0	0	0
N.S.	1	1.00	1.94	1.66	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.368	5.770	0.442	0.000	0.000	0.000	0.000	0.000

Problem 202	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	172	172	192	386	0	198	0	318	0
N.S.	1	1.00	1.12	2.24	0.00	1.15	0.00	1.85	0.00
time (sec)	N/A	0.220	0.485	0.243	0.000	0.285	0.000	0.410	0.000

Problem 203	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	341	341	670	568	0	0	0	0	0
N.S.	1	1.00	1.96	1.67	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.285	5.334	0.404	0.000	0.000	0.000	0.000	0.000

Problem 204	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	162	270	0	165	0	395	0
N.S.	1	1.00	1.08	1.80	0.00	1.10	0.00	2.63	0.00
time (sec)	N/A	0.097	0.940	0.132	0.000	0.273	0.000	0.358	0.000

Problem 205	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	332	332	660	570	0	0	0	0	0
N.S.	1	1.00	1.99	1.72	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.238	4.055	0.421	0.000	0.000	0.000	0.000	0.000

Problem 206	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	296	296	756	759	0	0	0	0	0
N.S.	1	1.00	2.55	2.56	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.345	4.556	0.440	0.000	0.000	0.000	0.000	0.000

Problem 207	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	429	429	1400	730	0	0	0	0	0
N.S.	1	1.00	3.26	1.70	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.510	11.770	0.570	0.000	0.000	0.000	0.000	0.000

Problem 208	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	403	403	1003	921	0	0	0	0	0
N.S.	1	1.00	2.49	2.29	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.561	7.922	0.509	0.000	0.000	0.000	0.000	0.000

Problem 209	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	572	572	1657	821	0	0	0	0	0
N.S.	1	1.00	2.90	1.44	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.867	12.708	0.679	0.000	0.000	0.000	0.000	0.000

Problem 210	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	374	374	242	1165	311	277	0	0	0
N.S.	1	1.00	0.65	3.11	0.83	0.74	0.00	0.00	0.00
time (sec)	N/A	0.335	0.228	0.639	0.312	0.286	0.000	0.000	0.000

Problem 211	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	303	303	246	678	0	0	0	0	0
N.S.	1	1.00	0.81	2.24	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.252	0.266	0.197	0.000	0.000	0.000	0.000	0.000

Problem 212	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	188	188	120	700	188	208	0	0	0
N.S.	1	1.00	0.64	3.72	1.00	1.11	0.00	0.00	0.00
time (sec)	N/A	0.107	0.210	0.207	0.308	0.267	0.000	0.000	0.000

Problem 213	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	192	192	128	531	0	0	0	0	0
N.S.	1	1.00	0.67	2.77	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.079	0.168	0.175	0.000	0.000	0.000	0.000	0.000

Problem 214	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	378	378	391	659	0	0	0	0	0
N.S.	1	1.00	1.03	1.74	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.239	1.230	0.213	0.000	0.000	0.000	0.000	0.000

Problem 215	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	227	227	257	565	0	0	0	0	0
N.S.	1	1.00	1.13	2.49	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.172	1.041	0.233	0.000	0.000	0.000	0.000	0.000

Problem 216	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	398	398	480	589	0	0	0	0	0
N.S.	1	1.00	1.21	1.48	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.245	4.000	0.279	0.000	0.000	0.000	0.000	0.000

Problem 217	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	314	314	248	2041	0	0	0	0	0
N.S.	1	1.00	0.79	6.50	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.181	1.181	0.290	0.000	0.000	0.000	0.000	0.000

Problem 218	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	503	503	244	1678	356	360	0	0	0
N.S.	1	1.00	0.49	3.34	0.71	0.72	0.00	0.00	0.00
time (sec)	N/A	0.514	0.289	0.398	0.305	0.282	0.000	0.000	0.000

Problem 219	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	421	421	297	1320	0	0	0	0	0
N.S.	1	1.00	0.71	3.14	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.431	0.237	0.292	0.000	0.000	0.000	0.000	0.000

Problem 220	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	279	279	159	1151	236	295	0	0	0
N.S.	1	1.00	0.57	4.13	0.85	1.06	0.00	0.00	0.00
time (sec)	N/A	0.140	0.143	0.486	0.303	0.271	0.000	0.000	0.000

Problem 221	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	305	307	247	929	0	0	0	0	0
N.S.	1	1.01	0.81	3.05	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.159	0.667	0.234	0.000	0.000	0.000	0.000	0.000

Problem 222	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	545	545	576	1072	0	0	0	0	0
N.S.	1	1.00	1.06	1.97	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.398	2.138	0.276	0.000	0.000	0.000	0.000	0.000

Problem 223	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	424	424	396	709	0	0	0	0	0
N.S.	1	1.00	0.93	1.67	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.270	3.112	0.272	0.000	0.000	0.000	0.000	0.000

Problem 224	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	590	590	854	884	0	0	0	0	0
N.S.	1	1.00	1.45	1.50	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.404	7.187	0.290	0.000	0.000	0.000	0.000	0.000

Problem 225	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	400	400	493	2250	0	0	0	0	0
N.S.	1	1.00	1.23	5.62	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.380	1.707	0.329	0.000	0.000	0.000	0.000	0.000

Problem 226	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	651	651	270	2146	401	486	0	0	0
N.S.	1	1.00	0.41	3.30	0.62	0.75	0.00	0.00	0.00
time (sec)	N/A	0.787	0.272	0.422	0.300	0.295	0.000	0.000	0.000

Problem 227	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	556	556	348	1939	0	0	0	0	0
N.S.	1	1.00	0.63	3.49	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.667	0.283	0.348	0.000	0.000	0.000	0.000	0.000

Problem 228	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	382	382	176	1611	281	405	0	0	0
N.S.	1	1.00	0.46	4.22	0.74	1.06	0.00	0.00	0.00
time (sec)	N/A	0.185	0.210	0.427	0.296	0.277	0.000	0.000	0.000

Problem 229	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	438	438	299	1349	0	0	0	0	0
N.S.	1	1.00	0.68	3.08	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.261	0.795	0.272	0.000	0.000	0.000	0.000	0.000

Problem 230	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	687	687	775	1490	0	0	0	0	0
N.S.	1	1.00	1.13	2.17	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.591	3.628	0.342	0.000	0.000	0.000	0.000	0.000

Problem 231	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	561	561	586	972	0	0	0	0	0
N.S.	1	1.00	1.04	1.73	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.408	2.313	0.325	0.000	0.000	0.000	0.000	0.000

Problem 232	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	740	740	1073	1326	0	0	0	0	0
N.S.	1	1.00	1.45	1.79	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.642	7.482	0.342	0.000	0.000	0.000	0.000	0.000

Problem 233	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	591	591	690	2650	0	0	0	0	0
N.S.	1	1.00	1.17	4.48	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.534	3.113	0.352	0.000	0.000	0.000	0.000	0.000

Problem 234	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	400	400	230	1020	365	276	0	0	0
N.S.	1	1.00	0.58	2.55	0.91	0.69	0.00	0.00	0.00
time (sec)	N/A	0.366	0.124	0.332	0.306	0.285	0.000	0.000	0.000

Problem 235	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	337	337	283	722	0	0	0	0	0
N.S.	1	1.00	0.84	2.14	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.293	1.700	0.234	0.000	0.000	0.000	0.000	0.000

Problem 236	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	277	277	176	812	251	210	0	0	0
N.S.	1	1.00	0.64	2.93	0.91	0.76	0.00	0.00	0.00
time (sec)	N/A	0.216	0.091	0.355	0.295	0.269	0.000	0.000	0.000

Problem 237	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	213	210	517	0	0	0	0	0
N.S.	1	1.03	1.02	2.51	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.147	1.768	0.187	0.000	0.000	0.000	0.000	0.000

Problem 238	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	A	A	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	146	146	86	316	130	147	0	0	0
N.S.	1	1.00	0.59	2.16	0.89	1.01	0.00	0.00	0.00
time (sec)	N/A	0.077	0.072	0.142	0.296	0.273	0.000	0.000	0.000

Problem 239	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	49	49	64	143	47	0	0	0	0
N.S.	1	1.00	1.31	2.92	0.96	0.00	0.00	0.00	0.00
time (sec)	N/A	0.032	0.445	0.151	0.278	0.000	0.000	0.000	0.000

Problem 240	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	257	257	301	387	0	0	0	0	0
N.S.	1	1.00	1.17	1.51	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.149	0.635	0.161	0.000	0.000	0.000	0.000	0.000

Problem 241	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	183	159	427	0	0	0	0	0
N.S.	1	1.00	0.87	2.33	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.147	0.690	0.213	0.000	0.000	0.000	0.000	0.000

Problem 242	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	402	402	487	585	0	0	0	0	0
N.S.	1	1.00	1.21	1.46	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.285	4.395	0.246	0.000	0.000	0.000	0.000	0.000

Problem 243	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	319	319	269	2319	0	0	0	0	0
N.S.	1	1.00	0.84	7.27	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.280	0.760	0.259	0.000	0.000	0.000	0.000	0.000

Problem 244	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	549	549	453	1087	0	0	0	0	0
N.S.	1	1.00	0.83	1.98	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.493	0.853	0.536	0.000	0.000	0.000	0.000	0.000

Problem 245	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	424	424	312	807	0	0	0	0	0
N.S.	1	1.00	0.74	1.90	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.400	2.205	0.262	0.000	0.000	0.000	0.000	0.000

Problem 246	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	412	412	369	668	0	0	0	0	0
N.S.	1	1.00	0.90	1.62	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.301	0.694	0.398	0.000	0.000	0.000	0.000	0.000

Problem 247	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	250	250	295	504	0	0	0	0	0
N.S.	1	1.00	1.18	2.02	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.214	1.015	0.203	0.000	0.000	0.000	0.000	0.000

Problem 248	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	208	208	276	401	0	0	0	0	0
N.S.	1	1.00	1.33	1.93	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.125	1.580	0.138	0.000	0.000	0.000	0.000	0.000

Problem 249	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	195	195	165	354	0	0	0	0	0
N.S.	1	1.00	0.85	1.82	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.115	0.828	0.175	0.000	0.000	0.000	0.000	0.000

Problem 250	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	467	467	667	591	0	0	0	0	0
N.S.	1	1.00	1.43	1.27	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.314	1.891	0.260	0.000	0.000	0.000	0.000	0.000

Problem 251	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	333	333	322	513	0	0	0	0	0
N.S.	1	1.00	0.97	1.54	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.303	1.177	0.244	0.000	0.000	0.000	0.000	0.000

Problem 252	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	634	634	844	869	0	0	0	0	0
N.S.	1	1.00	1.33	1.37	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.559	7.957	0.343	0.000	0.000	0.000	0.000	0.000

Problem 253	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	483	483	462	2844	0	0	0	0	0
N.S.	1	1.00	0.96	5.89	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.548	1.080	0.316	0.000	0.000	0.000	0.000	0.000

Problem 254	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	546	546	594	815	0	0	0	0	0
N.S.	1	1.00	1.09	1.49	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.595	1.517	0.583	0.000	0.000	0.000	0.000	0.000

Problem 255	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	421	421	374	801	0	0	0	0	0
N.S.	1	1.00	0.89	1.90	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.466	1.380	0.338	0.000	0.000	0.000	0.000	0.000

Problem 256	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	332	332	511	505	0	0	0	0	0
N.S.	1	1.00	1.54	1.52	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.336	0.833	0.209	0.000	0.000	0.000	0.000	0.000

Problem 257	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	332	332	303	3298	0	0	0	0	0
N.S.	1	1.00	0.91	9.93	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.233	1.165	0.273	0.000	0.000	0.000	0.000	0.000

Problem 258	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	294	294	461	468	0	0	0	0	0
N.S.	1	1.00	1.57	1.59	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.145	1.795	0.319	0.000	0.000	0.000	0.000	0.000

Problem 259	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	311	311	320	2895	0	0	0	0	0
N.S.	1	1.00	1.03	9.31	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.185	1.172	0.243	0.000	0.000	0.000	0.000	0.000

Problem 260	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD
size	577	577	935	924	0	0	0	0	0
N.S.	1	1.00	1.62	1.60	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.516	8.740	0.384	0.000	0.000	0.000	0.000	0.000

Problem 261	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	452	452	352	3773	0	0	0	0	0
N.S.	1	1.00	0.78	8.35	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.432	2.980	0.311	0.000	0.000	0.000	0.000	0.000

Problem 262	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	752	752	1090	1121	0	0	0	0	0
N.S.	1	1.00	1.45	1.49	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.794	9.806	0.421	0.000	0.000	0.000	0.000	0.000

Problem 263	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	538	538	441	5225	0	0	0	0	0
N.S.	1	1.00	0.82	9.71	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.751	3.374	0.335	0.000	0.000	0.000	0.000	0.000

Problem 264	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	100	129	0	84	146	143	0
N.S.	1	1.00	0.64	0.82	0.00	0.54	0.93	0.91	0.00
time (sec)	N/A	0.179	0.051	0.115	0.000	0.252	0.515	0.315	0.000

Problem 265	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	126	81	127	105	64	121	0	0
N.S.	1	1.00	0.64	1.01	0.83	0.51	0.96	0.00	0.00
time (sec)	N/A	0.134	0.043	0.152	0.295	0.266	0.404	0.000	0.000

Problem 266	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	89	73	71	0	59	78	81	0
N.S.	1	1.00	0.82	0.80	0.00	0.66	0.88	0.91	0.00
time (sec)	N/A	0.091	0.027	0.171	0.000	0.253	0.322	0.330	0.000

Problem 267	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	55	55	51	80	49	35	49	49	0
N.S.	1	1.00	0.93	1.45	0.89	0.64	0.89	0.89	0.00
time (sec)	N/A	0.048	0.017	0.143	0.280	0.257	0.244	0.301	0.000

Problem 268	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	11	11	10	11	11
N.S.	1	1.00	1.00	0.92	0.85	0.85	0.77	0.85	0.85
time (sec)	N/A	0.020	0.007	0.157	0.281	0.250	0.204	0.315	0.158

Problem 269	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	92	92	116	161	0	0	0	0	0
N.S.	1	1.00	1.26	1.75	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.092	0.156	0.141	0.000	0.000	0.000	0.000	0.000

Problem 270	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	76	76	72	141	0	0	0	0	0
N.S.	1	1.00	0.95	1.86	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.098	0.273	0.143	0.000	0.000	0.000	0.000	0.000

Problem 271	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	163	163	194	254	0	0	0	0	0
N.S.	1	1.00	1.19	1.56	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.170	1.161	0.194	0.000	0.000	0.000	0.000	0.000

Problem 272	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	42	52	14	0	0	0	0
N.S.	1	1.00	1.00	1.24	0.33	0.00	0.00	0.00	0.00
time (sec)	N/A	0.027	0.077	0.108	0.269	0.000	0.000	0.000	0.000

Problem 273	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	179	179	108	169	0	0	0	0	0
N.S.	1	1.00	0.60	0.94	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.092	0.197	0.154	0.000	0.000	0.000	0.000	0.000

Problem 274	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	283	283	149	365	0	0	0	0	0
N.S.	1	1.00	0.53	1.29	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.161	0.496	0.187	0.000	0.000	0.000	0.000	0.000

Problem 275	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	390	390	234	556	0	0	0	0	0
N.S.	1	1.00	0.60	1.43	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.225	0.705	0.226	0.000	0.000	0.000	0.000	0.000

Problem 276	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	1312	1312	539	0	0	0	0	0	0
N.S.	1	1.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.098	0.804	0.000	0.000	0.000	0.000	0.000	0.000

Problem 277	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	756	756	403	0	0	0	0	0	0
N.S.	1	1.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.548	0.535	0.000	0.000	0.000	0.000	0.000	0.000

Problem 278	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	371	371	267	0	0	0	0	0	0
N.S.	1	1.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.252	0.299	0.000	0.000	0.000	0.000	0.000	0.000

Problem 279	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	27	27	29	27	32	43	66	31	29
N.S.	1	1.00	1.07	1.00	1.19	1.59	2.44	1.15	1.07
time (sec)	N/A	0.066	6.602	0.263	0.812	0.252	3.709	0.931	0.276

Problem 280	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	27	27	29	27	30	55	92	30	29
N.S.	1	1.00	1.07	1.00	1.11	2.04	3.41	1.11	1.07
time (sec)	N/A	0.280	8.428	0.283	0.772	0.264	15.094	0.904	0.173

Problem 281	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	27	27	29	27	32	69	119	31	29
N.S.	1	1.00	1.07	1.00	1.19	2.56	4.41	1.15	1.07
time (sec)	N/A	0.618	9.814	0.323	0.897	0.251	117.237	0.883	0.167

Problem 282	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	29	31	27	29	134	0	0	29
N.S.	1	1.00	1.07	0.93	1.00	4.62	0.00	0.00	1.00
time (sec)	N/A	0.811	9.758	5.469	0.911	0.251	0.000	0.000	0.245

Problem 283	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	29	31	27	29	85	0	0	29
N.S.	1	1.00	1.07	0.93	1.00	2.93	0.00	0.00	1.00
time (sec)	N/A	0.414	0.604	1.994	0.760	0.254	0.000	0.000	0.234

Problem 284	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	29	31	27	29	41	31	0	29
N.S.	1	1.00	1.07	0.93	1.00	1.41	1.07	0.00	1.00
time (sec)	N/A	0.222	0.400	0.748	0.584	0.266	20.065	0.000	0.349

Problem 285	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	29	31	27	29	56	31	29	29
N.S.	1	1.00	1.07	0.93	1.00	1.93	1.07	1.00	1.00
time (sec)	N/A	0.095	3.903	0.391	0.586	0.253	7.686	1.073	0.324

Problem 286	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	29	31	27	29	68	31	0	29
N.S.	1	1.00	1.07	0.93	1.00	2.34	1.07	0.00	1.00
time (sec)	N/A	0.102	4.394	0.338	0.635	0.257	11.902	0.000	0.247

Problem 287	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	29	31	27	29	82	31	0	29
N.S.	1	1.00	1.07	0.93	1.00	2.83	1.07	0.00	1.00
time (sec)	N/A	0.103	4.562	0.366	0.657	0.265	152.970	0.000	0.239

Problem 288	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	22	24	36	26	24	24
N.S.	1	1.00	1.08	0.92	1.00	1.50	1.08	1.00	1.00
time (sec)	N/A	0.059	0.901	0.289	0.439	0.249	1.142	0.624	0.133

Problem 289	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	370	370	171	278	284	202	355	379	0
N.S.	1	1.00	0.46	0.75	0.77	0.55	0.96	1.02	0.00
time (sec)	N/A	0.481	0.209	0.197	0.308	0.263	1.137	0.304	0.000

Problem 290	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	273	273	139	206	216	158	262	267	0
N.S.	1	1.00	0.51	0.75	0.79	0.58	0.96	0.98	0.00
time (sec)	N/A	0.272	0.128	0.109	0.285	0.256	0.584	0.314	0.000

Problem 291	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	158	158	101	132	128	95	150	139	0
N.S.	1	1.00	0.64	0.84	0.81	0.60	0.95	0.88	0.00
time (sec)	N/A	0.146	0.063	0.066	0.291	0.254	0.292	0.310	0.000

Problem 292	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	200	200	162	0	36	0	0	0	0
N.S.	1	1.00	0.81	0.00	0.18	0.00	0.00	0.00	0.00
time (sec)	N/A	0.094	0.237	0.000	0.435	0.000	0.000	0.000	0.000

Problem 293	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	337	337	234	438	57	0	0	0	0
N.S.	1	1.00	0.69	1.30	0.17	0.00	0.00	0.00	0.00
time (sec)	N/A	0.233	0.398	0.234	0.546	0.000	0.000	0.000	0.000

Problem 294	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	A	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	455	455	1544	543	78	0	0	0	0
N.S.	1	1.00	3.39	1.19	0.17	0.00	0.00	0.00	0.00
time (sec)	N/A	0.362	12.760	0.247	0.663	0.000	0.000	0.000	0.000

Problem 295	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	533	533	179	699	0	0	0	0	0
N.S.	1	1.00	0.34	1.31	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.397	0.694	0.207	0.000	0.000	0.000	0.000	0.000

Problem 296	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	365	365	138	474	0	0	0	0	0
N.S.	1	1.00	0.38	1.30	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.228	0.323	0.159	0.000	0.000	0.000	0.000	0.000

Problem 297	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	215	215	114	260	0	0	0	0	0
N.S.	1	1.00	0.53	1.21	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.123	0.044	0.138	0.000	0.000	0.000	0.000	0.000

Problem 298	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	42	52	14	0	0	0	0
N.S.	1	1.00	1.00	1.24	0.33	0.00	0.00	0.00	0.00
time (sec)	N/A	0.028	0.070	0.145	0.324	0.000	0.000	0.000	0.000

Problem 299	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	238	238	157	203	49	0	0	0	0
N.S.	1	1.00	0.66	0.85	0.21	0.00	0.00	0.00	0.00
time (sec)	N/A	0.132	0.235	0.185	0.771	0.000	0.000	0.000	0.000

Problem 300	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	388	388	211	535	106	0	0	0	0
N.S.	1	1.00	0.54	1.38	0.27	0.00	0.00	0.00	0.00
time (sec)	N/A	0.231	0.491	0.234	0.516	0.000	0.000	0.000	0.000

Problem 301	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	547	547	319	891	0	0	0	0	0
N.S.	1	1.00	0.58	1.63	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.354	0.693	0.286	0.000	0.000	0.000	0.000	0.000

Problem 302	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	22	24	36	26	24	24
N.S.	1	1.00	1.08	0.92	1.00	1.50	1.08	1.00	1.00
time (sec)	N/A	0.058	0.955	0.200	0.436	0.255	2.424	0.668	0.123

Problem 303	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	191	191	125	160	0	111	185	192	0
N.S.	1	1.00	0.65	0.84	0.00	0.58	0.97	1.01	0.00
time (sec)	N/A	0.314	0.047	0.103	0.000	0.267	0.738	0.318	0.000

Problem 304	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	100	180	131	85	148	0	0
N.S.	1	1.00	0.64	1.15	0.83	0.54	0.94	0.00	0.00
time (sec)	N/A	0.213	0.037	0.204	0.283	0.254	0.548	0.000	0.000

Problem 305	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	85	85	0	73	100	108	0
N.S.	1	1.00	0.79	0.79	0.00	0.68	0.93	1.01	0.00
time (sec)	N/A	0.143	0.024	0.122	0.000	0.246	0.405	0.326	0.000

Problem 306	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	67	67	61	107	64	46	61	62	0
N.S.	1	1.00	0.91	1.60	0.96	0.69	0.91	0.93	0.00
time (sec)	N/A	0.072	0.014	0.161	0.273	0.262	0.325	0.326	0.000

Problem 307	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	11	11	10	11	11
N.S.	1	1.00	1.00	0.92	0.85	0.85	0.77	0.85	0.85
time (sec)	N/A	0.022	0.006	0.103	0.276	0.247	0.252	0.320	0.146

Problem 308	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	138	138	180	225	0	0	0	0	0
N.S.	1	1.00	1.30	1.63	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.117	0.163	0.180	0.000	0.000	0.000	0.000	0.000

Problem 309	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	99	99	108	205	0	0	0	0	0
N.S.	1	1.00	1.09	2.07	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.129	0.216	0.128	0.000	0.000	0.000	0.000	0.000

Problem 310	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	264	264	317	399	0	0	0	0	0
N.S.	1	1.00	1.20	1.51	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.245	3.442	0.152	0.000	0.000	0.000	0.000	0.000

Problem 311	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	67	67	43	42	0	0	0	59	0
N.S.	1	1.00	0.64	0.63	0.00	0.00	0.00	0.88	0.00
time (sec)	N/A	0.078	0.294	0.109	0.000	0.000	0.000	0.313	0.000

Problem 312	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	50	50	34	33	0	0	0	44	0
N.S.	1	1.00	0.68	0.66	0.00	0.00	0.00	0.88	0.00
time (sec)	N/A	0.065	0.090	0.181	0.000	0.000	0.000	0.298	0.000

Problem 313	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	29	29	23	22	0	0	0	25	0
N.S.	1	1.00	0.79	0.76	0.00	0.00	0.00	0.86	0.00
time (sec)	N/A	0.048	0.034	0.038	0.000	0.000	0.000	0.289	0.000

Problem 314	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	20	20	22	20	25	24	22	24	22
N.S.	1	1.00	1.10	1.00	1.25	1.20	1.10	1.20	1.10
time (sec)	N/A	0.019	2.596	0.217	0.378	0.241	0.755	0.455	0.140

Problem 315	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	20	20	22	20	23	36	36	23	22
N.S.	1	1.00	1.10	1.00	1.15	1.80	1.80	1.15	1.10
time (sec)	N/A	0.017	7.012	0.447	0.388	0.239	1.036	1.132	0.147

Problem 316	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	206	152	157	0	0	0	472	0
N.S.	1	1.00	0.74	0.76	0.00	0.00	0.00	2.29	0.00
time (sec)	N/A	0.258	0.336	0.135	0.000	0.000	0.000	0.321	0.000

Problem 317	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	183	135	138	0	0	0	0	0
N.S.	1	1.00	0.74	0.75	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.237	0.270	0.108	0.000	0.000	0.000	0.000	0.000

Problem 318	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	66	65	0	0	0	169	0
N.S.	1	1.00	0.80	0.79	0.00	0.00	0.00	2.06	0.00
time (sec)	N/A	0.148	0.249	0.121	0.000	0.000	0.000	0.320	0.000

Problem 319	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	91	92	0	0	0	172	0
N.S.	1	1.00	0.75	0.76	0.00	0.00	0.00	1.42	0.00
time (sec)	N/A	0.157	0.267	0.103	0.000	0.000	0.000	0.349	0.000

Problem 320	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	62	63	0	0	0	102	0
N.S.	1	1.00	0.76	0.77	0.00	0.00	0.00	1.24	0.00
time (sec)	N/A	0.093	0.278	0.115	0.000	0.000	0.000	0.322	0.000

Problem 321	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	28	26	0	28
N.S.	1	1.00	1.07	0.93	1.00	1.00	0.93	0.00	1.00
time (sec)	N/A	0.265	3.489	0.181	0.376	0.236	0.762	0.000	0.157

Problem 322	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	32	27	28	28
N.S.	1	1.00	1.07	0.93	1.00	1.14	0.96	1.00	1.00
time (sec)	N/A	0.197	1.853	0.201	0.416	0.237	0.646	0.471	0.151

Problem 323	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	32	27	0	28
N.S.	1	1.00	1.07	0.93	1.00	1.14	0.96	0.00	1.00
time (sec)	N/A	0.077	4.791	0.780	0.378	0.241	0.711	0.000	0.155

Problem 324	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	32	27	28	28
N.S.	1	1.00	1.07	0.93	1.00	1.14	0.96	1.00	1.00
time (sec)	N/A	0.077	1.213	0.926	0.371	0.240	0.821	1.239	0.152

Problem 325	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	245	245	179	184	0	0	0	614	0
N.S.	1	1.00	0.73	0.75	0.00	0.00	0.00	2.51	0.00
time (sec)	N/A	0.295	0.755	0.131	0.000	0.000	0.000	0.341	0.000

Problem 326	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	206	165	157	0	0	0	473	0
N.S.	1	1.00	0.80	0.76	0.00	0.00	0.00	2.30	0.00
time (sec)	N/A	0.241	0.536	0.108	0.000	0.000	0.000	0.323	0.000

Problem 327	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	183	136	139	0	0	0	360	0
N.S.	1	1.00	0.74	0.76	0.00	0.00	0.00	1.97	0.00
time (sec)	N/A	0.197	0.443	0.186	0.000	0.000	0.000	0.334	0.000

Problem 328	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	121	111	0	0	0	252	0
N.S.	1	1.00	0.84	0.77	0.00	0.00	0.00	1.75	0.00
time (sec)	N/A	0.140	0.417	0.152	0.000	0.000	0.000	0.324	0.000

Problem 329	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	28	26	0	28
N.S.	1	1.00	1.07	0.93	1.00	1.00	0.93	0.00	1.00
time (sec)	N/A	0.443	3.353	0.089	0.408	0.241	2.149	0.000	0.153

Problem 330	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	32	27	28	28
N.S.	1	1.00	1.07	0.93	1.00	1.14	0.96	1.00	1.00
time (sec)	N/A	0.351	2.278	0.095	0.407	0.237	1.769	0.520	0.151

Problem 331	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	32	27	0	28
N.S.	1	1.00	1.07	0.93	1.00	1.14	0.96	0.00	1.00
time (sec)	N/A	0.086	4.962	0.372	0.420	0.239	1.981	0.000	0.153

Problem 332	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	32	27	28	28
N.S.	1	1.00	1.07	0.93	1.00	1.14	0.96	1.00	1.00
time (sec)	N/A	0.086	1.265	0.838	0.420	0.247	2.632	1.583	0.152

Problem 333	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	245	245	180	185	0	0	0	746	0
N.S.	1	1.00	0.73	0.76	0.00	0.00	0.00	3.04	0.00
time (sec)	N/A	0.284	0.967	0.127	0.000	0.000	0.000	0.349	0.000

Problem 334	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	268	268	209	203	0	0	0	757	0
N.S.	1	1.00	0.78	0.76	0.00	0.00	0.00	2.82	0.00
time (sec)	N/A	0.293	0.871	0.113	0.000	0.000	0.000	0.337	0.000

Problem 335	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	245	245	180	185	0	0	0	614	0
N.S.	1	1.00	0.73	0.76	0.00	0.00	0.00	2.51	0.00
time (sec)	N/A	0.232	0.788	0.109	0.000	0.000	0.000	0.332	0.000

Problem 336	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	206	165	157	0	0	0	472	0
N.S.	1	1.00	0.80	0.76	0.00	0.00	0.00	2.29	0.00
time (sec)	N/A	0.180	0.660	0.108	0.000	0.000	0.000	0.340	0.000

Problem 337	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	45	26	0	28
N.S.	1	1.00	1.07	0.93	1.00	1.61	0.93	0.00	1.00
time (sec)	N/A	0.691	3.218	0.089	0.499	0.249	5.214	0.000	0.148

Problem 338	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	49	27	28	28
N.S.	1	1.00	1.07	0.93	1.00	1.75	0.96	1.00	1.00
time (sec)	N/A	0.544	2.152	0.099	0.498	0.259	3.869	0.563	0.144

Problem 339	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	49	27	0	28
N.S.	1	1.00	1.07	0.93	1.00	1.75	0.96	0.00	1.00
time (sec)	N/A	0.086	4.690	0.503	0.518	0.252	4.002	0.000	0.148

Problem 340	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	49	27	28	28
N.S.	1	1.00	1.07	0.93	1.00	1.75	0.96	1.00	1.00
time (sec)	N/A	0.093	1.347	0.929	0.496	0.242	4.481	1.577	0.151

Problem 341	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	41	41	33	30	0	0	0	35	0
N.S.	1	1.00	0.80	0.73	0.00	0.00	0.00	0.85	0.00
time (sec)	N/A	0.109	0.130	0.123	0.000	0.000	0.000	0.294	0.000

Problem 342	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	27	27	22	21	0	0	0	0	0
N.S.	1	1.00	0.81	0.78	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.103	0.111	0.105	0.000	0.000	0.000	0.000	0.000

Problem 343	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	27	27	22	21	0	0	0	23	0
N.S.	1	1.00	0.81	0.78	0.00	0.00	0.00	0.85	0.00
time (sec)	N/A	0.087	0.092	0.119	0.000	0.000	0.000	0.304	0.000

Problem 344	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	27	27	22	21	0	0	0	23	0
N.S.	1	1.00	0.81	0.78	0.00	0.00	0.00	0.85	0.00
time (sec)	N/A	0.088	0.010	0.000	0.000	0.000	0.000	0.285	0.000

Problem 345	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	9	9	9	10	0	0	0	9	0
N.S.	1	1.00	1.00	1.11	0.00	0.00	0.00	1.00	0.00
time (sec)	N/A	0.048	0.076	0.111	0.000	0.000	0.000	0.275	0.000

Problem 346	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	9	9	9	10	9	11	7	10	9
N.S.	1	1.00	1.00	1.11	1.00	1.22	0.78	1.11	1.00
time (sec)	N/A	0.022	0.017	0.130	0.275	0.238	0.222	0.287	0.154

Problem 347	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	22	24	35	24	24	24
N.S.	1	1.00	1.08	0.92	1.00	1.46	1.00	1.00	1.00
time (sec)	N/A	0.055	1.871	0.245	0.405	0.242	0.440	0.305	0.125

Problem 348	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	22	24	37	26	24	24
N.S.	1	1.00	1.08	0.92	1.00	1.54	1.08	1.00	1.00
time (sec)	N/A	0.060	0.114	0.071	0.390	0.238	0.454	0.301	0.121

Problem 349	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	183	136	139	0	0	0	0	0
N.S.	1	1.00	0.74	0.76	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.215	0.338	0.125	0.000	0.000	0.000	0.000	0.000

Problem 350	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	108	111	0	0	0	254	0
N.S.	1	1.00	0.75	0.77	0.00	0.00	0.00	1.76	0.00
time (sec)	N/A	0.204	0.278	0.220	0.000	0.000	0.000	0.328	0.000

Problem 351	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	92	93	0	0	0	0	0
N.S.	1	1.00	0.76	0.77	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.184	0.239	0.110	0.000	0.000	0.000	0.000	0.000

Problem 352	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	64	65	0	0	0	104	0
N.S.	1	1.00	0.78	0.79	0.00	0.00	0.00	1.27	0.00
time (sec)	N/A	0.148	0.227	0.128	0.000	0.000	0.000	0.312	0.000

Problem 353	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	54	54	45	46	0	0	0	50	0
N.S.	1	1.00	0.83	0.85	0.00	0.00	0.00	0.93	0.00
time (sec)	N/A	0.095	0.172	0.117	0.000	0.000	0.000	0.316	0.000

Problem 354	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	C	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	16	16	16	17	16	19	42	17	16
N.S.	1	1.00	1.00	1.06	1.00	1.19	2.62	1.06	1.00
time (sec)	N/A	0.033	0.062	0.120	0.299	0.248	0.848	0.313	0.189

Problem 355	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	49	27	0	28
N.S.	1	1.00	1.07	0.93	1.00	1.75	0.96	0.00	1.00
time (sec)	N/A	0.083	5.019	0.119	0.385	0.247	1.259	0.000	0.161

Problem 356	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	53	29	28	28
N.S.	1	1.00	1.07	0.93	1.00	1.89	1.04	1.00	1.00
time (sec)	N/A	0.090	0.109	0.063	0.402	0.234	1.037	0.495	0.148

Problem 357	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	63	27	28	28
N.S.	1	1.00	1.07	0.93	1.00	2.25	0.96	1.00	1.00
time (sec)	N/A	0.092	8.542	0.159	0.411	0.251	1.765	0.872	0.121

Problem 358	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	26	28	24	26	61	26	0	26
N.S.	1	1.00	1.08	0.92	1.00	2.35	1.00	0.00	1.00
time (sec)	N/A	0.067	10.230	0.165	0.399	0.252	2.002	0.000	0.121

Problem 359	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	25	60	26	25	25
N.S.	1	1.00	1.08	0.92	1.00	2.40	1.04	1.00	1.00
time (sec)	N/A	0.040	0.140	0.060	0.402	0.249	2.173	0.512	0.123

Problem 360	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	64	27	0	28
N.S.	1	1.00	1.07	0.93	1.00	2.29	0.96	0.00	1.00
time (sec)	N/A	0.102	8.722	0.767	0.420	0.245	3.911	0.000	0.152

Problem 361	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	68	29	28	28
N.S.	1	1.00	1.07	0.93	1.00	2.43	1.04	1.00	1.00
time (sec)	N/A	0.096	7.581	0.309	0.427	0.248	2.806	3.527	0.149

Problem 362	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	86	27	28	28
N.S.	1	1.00	1.07	0.93	1.00	3.07	0.96	1.00	1.00
time (sec)	N/A	0.091	6.066	0.613	0.455	0.248	2.102	2.260	0.123

Problem 363	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	26	28	24	26	84	26	0	26
N.S.	1	1.00	1.08	0.92	1.00	3.23	1.00	0.00	1.00
time (sec)	N/A	0.062	21.494	0.615	0.435	0.249	2.049	0.000	0.124

Problem 364	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	25	83	26	25	25
N.S.	1	1.00	1.08	0.92	1.00	3.32	1.04	1.00	1.00
time (sec)	N/A	0.032	0.153	0.477	0.442	0.243	2.408	1.103	0.124

Problem 365	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	85	27	0	28
N.S.	1	1.00	1.07	0.93	1.00	3.04	0.96	0.00	1.00
time (sec)	N/A	0.087	6.832	1.661	0.429	0.251	4.764	0.000	0.151

Problem 366	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	89	29	28	28
N.S.	1	1.00	1.07	0.93	1.00	3.18	1.04	1.00	1.00
time (sec)	N/A	0.089	10.601	1.323	0.427	0.248	3.159	9.191	0.162

Problem 367	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	45	27	0	28
N.S.	1	1.00	1.07	0.93	1.00	1.61	0.96	0.00	1.00
time (sec)	N/A	0.083	1.105	0.793	0.542	0.242	177.454	0.000	0.126

Problem 368	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	38	27	0	28
N.S.	1	1.00	1.07	0.93	1.00	1.36	0.96	0.00	1.00
time (sec)	N/A	0.087	0.610	0.584	0.496	0.244	15.021	0.000	0.122

Problem 369	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	28	27	0	28
N.S.	1	1.00	1.07	0.93	1.00	1.00	0.96	0.00	1.00
time (sec)	N/A	0.075	0.119	0.571	0.421	0.270	0.752	0.000	0.125

Problem 370	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	50	27	28	28
N.S.	1	1.00	1.07	0.93	1.00	1.79	0.96	1.00	1.00
time (sec)	N/A	0.081	0.976	0.218	0.408	0.243	0.913	0.487	0.131

Problem 371	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	63	27	28	28
N.S.	1	1.00	1.07	0.93	1.00	2.25	0.96	1.00	1.00
time (sec)	N/A	0.094	1.381	0.332	0.436	0.247	9.423	0.665	0.132

Problem 372	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	28	86	27	28	28
N.S.	1	1.00	1.07	0.93	1.00	3.07	0.96	1.00	1.00
time (sec)	N/A	0.088	2.069	0.359	0.448	0.244	18.373	1.248	0.129

Problem 373	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	22	24	36	24	24	24
N.S.	1	1.00	1.08	0.92	1.00	1.50	1.00	1.00	1.00
time (sec)	N/A	0.060	0.429	0.174	0.399	0.243	0.699	0.445	0.125

Problem 374	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	95	83	105	0	0	0	95	0
N.S.	1	1.00	0.87	1.11	0.00	0.00	0.00	1.00	0.00
time (sec)	N/A	0.118	0.511	0.141	0.000	0.000	0.000	0.327	0.000

Problem 375	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	78	78	70	83	0	0	0	81	0
N.S.	1	1.00	0.90	1.06	0.00	0.00	0.00	1.04	0.00
time (sec)	N/A	0.105	0.334	0.135	0.000	0.000	0.000	0.311	0.000

Problem 376	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	55	55	55	59	0	0	0	49	0
N.S.	1	1.00	1.00	1.07	0.00	0.00	0.00	0.89	0.00
time (sec)	N/A	0.086	0.355	0.041	0.000	0.000	0.000	0.325	0.000

Problem 377	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	20	20	22	20	153	24	26	24	22
N.S.	1	1.00	1.10	1.00	7.65	1.20	1.30	1.20	1.10
time (sec)	N/A	0.073	4.268	0.273	0.611	0.239	0.934	0.510	0.146

Problem 378	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	20	20	22	20	202	36	41	23	22
N.S.	1	1.00	1.10	1.00	10.10	1.80	2.05	1.15	1.10
time (sec)	N/A	0.068	13.431	0.487	0.675	0.239	1.604	1.376	0.150

Problem 379	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	B	A	F	B	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	17	17	17	0	37	21	0	70	0
N.S.	1	1.00	1.00	0.00	2.18	1.24	0.00	4.12	0.00
time (sec)	N/A	0.089	0.237	0.000	0.639	0.241	0.000	0.360	0.000

Problem 380	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	138	42	29	0	28
N.S.	1	1.00	1.07	0.93	4.93	1.50	1.04	0.00	1.00
time (sec)	N/A	0.077	0.630	0.852	1.326	0.254	1.635	0.000	0.151

Problem 381	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	214	214	175	340	0	0	0	0	0
N.S.	1	1.00	0.82	1.59	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.378	0.424	0.127	0.000	0.000	0.000	0.000	0.000

Problem 382	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	94	94	82	136	0	0	0	563	0
N.S.	1	1.00	0.87	1.45	0.00	0.00	0.00	5.99	0.00
time (sec)	N/A	0.275	0.291	0.122	0.000	0.000	0.000	0.408	0.000

Problem 383	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	125	223	0	0	0	608	0
N.S.	1	1.00	0.83	1.49	0.00	0.00	0.00	4.05	0.00
time (sec)	N/A	0.223	0.272	0.192	0.000	0.000	0.000	0.400	0.000

Problem 384	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	86	72	134	0	0	0	290	0
N.S.	1	1.00	0.84	1.56	0.00	0.00	0.00	3.37	0.00
time (sec)	N/A	0.098	0.179	0.115	0.000	0.000	0.000	0.375	0.000

Problem 385	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	128	43	27	0	28
N.S.	1	1.00	1.07	0.93	4.57	1.54	0.96	0.00	1.00
time (sec)	N/A	0.142	10.618	0.394	0.767	0.247	1.088	0.000	0.156

Problem 386	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	126	49	29	28	28
N.S.	1	1.00	1.07	0.93	4.50	1.75	1.04	1.00	1.00
time (sec)	N/A	0.094	2.035	0.251	0.679	0.242	0.983	0.824	0.154

Problem 387	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	135	49	29	0	28
N.S.	1	1.00	1.07	0.93	4.82	1.75	1.04	0.00	1.00
time (sec)	N/A	0.079	13.067	0.998	0.835	0.236	1.220	0.000	0.156

Problem 388	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	136	49	29	28	28
N.S.	1	1.00	1.07	0.93	4.86	1.75	1.04	1.00	1.00
time (sec)	N/A	0.079	3.918	1.269	0.820	0.244	1.406	2.036	0.158

Problem 389	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	161	52	29	0	28
N.S.	1	1.00	1.07	0.93	5.75	1.86	1.04	0.00	1.00
time (sec)	N/A	0.087	0.663	0.803	1.658	0.239	36.921	0.000	0.164

Problem 390	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	278	278	399	455	0	0	0	2065	0
N.S.	1	1.00	1.44	1.64	0.00	0.00	0.00	7.43	0.00
time (sec)	N/A	0.527	0.843	0.132	0.000	0.000	0.000	0.422	0.000

Problem 391	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	220	220	306	364	0	0	0	1553	0
N.S.	1	1.00	1.39	1.65	0.00	0.00	0.00	7.06	0.00
time (sec)	N/A	0.367	0.648	0.244	0.000	0.000	0.000	0.421	0.000

Problem 392	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	214	214	295	341	0	0	0	1215	0
N.S.	1	1.00	1.38	1.59	0.00	0.00	0.00	5.68	0.00
time (sec)	N/A	0.399	0.462	0.136	0.000	0.000	0.000	0.406	0.000

Problem 393	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	122	250	0	0	0	747	0
N.S.	1	1.00	0.81	1.67	0.00	0.00	0.00	4.98	0.00
time (sec)	N/A	0.162	0.480	0.125	0.000	0.000	0.000	0.397	0.000

Problem 394	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	146	43	27	0	28
N.S.	1	1.00	1.07	0.93	5.21	1.54	0.96	0.00	1.00
time (sec)	N/A	0.244	8.855	0.154	0.924	0.252	3.016	0.000	0.154

Problem 395	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	146	49	29	28	28
N.S.	1	1.00	1.07	0.93	5.21	1.75	1.04	1.00	1.00
time (sec)	N/A	0.158	3.697	0.141	0.934	0.229	2.945	0.795	0.150

Problem 396	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	153	49	29	0	28
N.S.	1	1.00	1.07	0.93	5.46	1.75	1.04	0.00	1.00
time (sec)	N/A	0.086	13.520	0.528	0.939	0.240	3.816	0.000	0.156

Problem 397	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	146	49	29	28	28
N.S.	1	1.00	1.07	0.93	5.21	1.75	1.04	1.00	1.00
time (sec)	N/A	0.127	3.160	1.277	0.827	0.248	5.085	2.465	0.157

Problem 398	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	186	59	0	0	28
N.S.	1	1.00	1.07	0.93	6.64	2.11	0.00	0.00	1.00
time (sec)	N/A	0.088	0.699	0.830	2.019	0.251	0.000	0.000	0.159

Problem 399	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	278	278	408	454	0	0	0	2479	0
N.S.	1	1.00	1.47	1.63	0.00	0.00	0.00	8.92	0.00
time (sec)	N/A	0.654	1.185	0.158	0.000	0.000	0.000	0.427	0.000

Problem 400	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	282	282	414	478	0	0	0	2461	0
N.S.	1	1.00	1.47	1.70	0.00	0.00	0.00	8.73	0.00
time (sec)	N/A	0.544	0.946	0.129	0.000	0.000	0.000	0.436	0.000

Problem 401	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	276	276	404	455	0	0	0	2026	0
N.S.	1	1.00	1.46	1.65	0.00	0.00	0.00	7.34	0.00
time (sec)	N/A	0.489	0.811	0.132	0.000	0.000	0.000	0.416	0.000

Problem 402	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	217	217	311	364	0	0	0	1394	0
N.S.	1	1.00	1.43	1.68	0.00	0.00	0.00	6.42	0.00
time (sec)	N/A	0.216	0.701	0.135	0.000	0.000	0.000	0.400	0.000

Problem 403	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	161	60	27	0	28
N.S.	1	1.00	1.07	0.93	5.75	2.14	0.96	0.00	1.00
time (sec)	N/A	0.305	11.463	0.168	1.040	0.250	7.620	0.000	0.152

Problem 404	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	162	66	29	28	28
N.S.	1	1.00	1.07	0.93	5.79	2.36	1.04	1.00	1.00
time (sec)	N/A	0.193	3.222	0.171	1.153	0.243	7.953	0.831	0.148

Problem 405	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	169	66	29	0	28
N.S.	1	1.00	1.07	0.93	6.04	2.36	1.04	0.00	1.00
time (sec)	N/A	0.080	14.749	0.734	1.205	0.241	7.843	0.000	0.153

Problem 406	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	161	66	29	28	28
N.S.	1	1.00	1.07	0.93	5.75	2.36	1.04	1.00	1.00
time (sec)	N/A	0.080	3.861	1.310	1.200	0.237	11.224	2.390	0.155

Problem 407	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	112	80	29	28	28
N.S.	1	1.00	1.07	0.93	4.00	2.86	1.04	1.00	1.00
time (sec)	N/A	0.095	1.058	0.325	0.843	0.250	2.752	0.558	0.160

Problem 408	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	204	204	157	341	0	0	0	0	0
N.S.	1	1.00	0.77	1.67	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.249	0.313	0.128	0.000	0.000	0.000	0.000	0.000

Problem 409	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	141	141	117	250	0	0	0	876	0
N.S.	1	1.00	0.83	1.77	0.00	0.00	0.00	6.21	0.00
time (sec)	N/A	0.207	0.282	0.181	0.000	0.000	0.000	0.411	0.000

Problem 410	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	142	142	113	227	0	0	0	0	0
N.S.	1	1.00	0.80	1.60	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.195	0.244	0.128	0.000	0.000	0.000	0.000	0.000

Problem 411	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	79	79	70	136	0	0	0	346	0
N.S.	1	1.00	0.89	1.72	0.00	0.00	0.00	4.38	0.00
time (sec)	N/A	0.150	0.168	0.178	0.000	0.000	0.000	0.384	0.000

Problem 412	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	72	72	59	108	0	0	0	200	0
N.S.	1	1.00	0.82	1.50	0.00	0.00	0.00	2.78	0.00
time (sec)	N/A	0.101	0.156	0.131	0.000	0.000	0.000	0.393	0.000

Problem 413	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	C	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	18	18	18	19	18	18	53	18	18
N.S.	1	1.00	1.00	1.06	1.00	1.00	2.94	1.00	1.00
time (sec)	N/A	0.030	0.011	0.126	0.308	0.238	1.187	0.393	0.180

Problem 414	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	111	80	29	0	28
N.S.	1	1.00	1.07	0.93	3.96	2.86	1.04	0.00	1.00
time (sec)	N/A	0.100	6.680	0.133	0.879	0.241	1.818	0.000	0.154

Problem 415	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	120	86	31	28	28
N.S.	1	1.00	1.07	0.93	4.29	3.07	1.11	1.00	1.00
time (sec)	N/A	0.103	1.281	0.063	0.867	0.253	1.629	0.788	0.152

Problem 416	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	218	106	29	28	28
N.S.	1	1.00	1.07	0.93	7.79	3.79	1.04	1.00	1.00
time (sec)	N/A	0.091	1.409	0.352	1.369	0.246	64.360	1.128	0.159

Problem 417	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	205	106	29	0	28
N.S.	1	1.00	1.07	0.93	7.32	3.79	1.04	0.00	1.00
time (sec)	N/A	0.093	52.054	0.225	1.088	0.246	3.521	0.000	0.148

Problem 418	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	193	106	29	28	28
N.S.	1	1.00	1.07	0.93	6.89	3.79	1.04	1.00	1.00
time (sec)	N/A	0.134	7.280	0.194	0.853	0.252	3.418	1.766	0.149

Problem 419	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	26	28	24	198	104	27	0	26
N.S.	1	1.00	1.08	0.92	7.62	4.00	1.04	0.00	1.00
time (sec)	N/A	0.061	47.965	0.091	0.916	0.252	3.594	0.000	0.149

Problem 420	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	192	103	27	25	25
N.S.	1	1.00	1.08	0.92	7.68	4.12	1.08	1.00	1.00
time (sec)	N/A	0.074	2.283	0.065	0.849	0.249	4.413	1.006	0.150

Problem 421	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	209	108	29	0	28
N.S.	1	1.00	1.07	0.93	7.46	3.86	1.04	0.00	1.00
time (sec)	N/A	0.086	40.717	1.078	1.013	0.242	6.621	0.000	0.153

Problem 422	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	218	114	31	28	28
N.S.	1	1.00	1.07	0.93	7.79	4.07	1.11	1.00	1.00
time (sec)	N/A	0.091	27.958	0.590	0.929	0.244	5.647	17.555	0.151

Problem 423	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	278	144	29	28	28
N.S.	1	1.00	1.07	0.93	9.93	5.14	1.04	1.00	1.00
time (sec)	N/A	0.091	2.063	0.395	1.420	0.247	78.580	2.311	0.160

Problem 424	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	266	144	29	0	28
N.S.	1	1.00	1.07	0.93	9.50	5.14	1.04	0.00	1.00
time (sec)	N/A	0.090	78.702	0.708	1.216	0.243	3.990	0.000	0.153

Problem 425	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	263	144	29	28	28
N.S.	1	1.00	1.07	0.93	9.39	5.14	1.04	1.00	1.00
time (sec)	N/A	0.090	12.500	0.628	1.035	0.242	3.829	5.036	0.150

Problem 426	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	26	28	24	261	142	27	0	26
N.S.	1	1.00	1.08	0.92	10.04	5.46	1.04	0.00	1.00
time (sec)	N/A	0.061	78.688	0.664	1.168	0.248	3.659	0.000	0.145

Problem 427	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	25	27	23	255	141	27	25	25
N.S.	1	1.00	1.08	0.92	10.20	5.64	1.08	1.00	1.00
time (sec)	N/A	0.077	4.775	0.337	0.910	0.243	3.920	2.186	0.152

Problem 428	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	271	144	29	0	28
N.S.	1	1.00	1.07	0.93	9.68	5.14	1.04	0.00	1.00
time (sec)	N/A	0.089	60.510	2.609	1.177	0.242	8.168	0.000	0.151

Problem 429	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	28	28	30	26	280	150	31	28	28
N.S.	1	1.00	1.07	0.93	10.00	5.36	1.11	1.00	1.00
time (sec)	N/A	0.086	23.641	1.872	1.091	0.250	6.128	48.377	0.151

Problem 430	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	11	11	12	11	11
N.S.	1	1.00	1.00	0.92	0.85	0.85	0.92	0.85	0.85
time (sec)	N/A	0.021	0.026	0.134	0.278	0.237	0.330	0.320	0.135

Problem 431	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	251	251	287	304	0	0	0	0	0
N.S.	1	1.00	1.14	1.21	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.761	0.520	0.288	0.000	0.000	0.000	0.000	0.000

Problem 432	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	591	591	514	447	0	0	0	0	0
N.S.	1	1.00	0.87	0.76	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.829	1.227	0.152	0.000	0.000	0.000	0.000	0.000

Problem 433	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	241	241	276	303	0	0	0	0	0
N.S.	1	1.00	1.15	1.26	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.412	0.255	0.118	0.000	0.000	0.000	0.000	0.000

Problem 434	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	253	253	348	304	0	0	0	0	0
N.S.	1	1.00	1.38	1.20	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.292	0.688	0.085	0.000	0.000	0.000	0.000	0.000

Problem 435	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	27	27	29	25	30	0	87	0	27
N.S.	1	1.00	1.07	0.93	1.11	0.00	3.22	0.00	1.00
time (sec)	N/A	0.457	0.838	0.185	0.899	0.000	4.237	0.000	0.185

Problem 436	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	485	485	540	591	0	0	0	0	0
N.S.	1	1.00	1.11	1.22	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.874	2.411	0.161	0.000	0.000	0.000	0.000	0.000

Problem 437	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	511	511	686	594	0	0	0	0	0
N.S.	1	1.00	1.34	1.16	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.096	1.352	0.166	0.000	0.000	0.000	0.000	0.000

Problem 438	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	373	373	410	449	0	0	0	0	0
N.S.	1	1.00	1.10	1.20	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.712	0.629	0.135	0.000	0.000	0.000	0.000	0.000

Problem 439	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	390	390	522	451	0	0	0	0	0
N.S.	1	1.00	1.34	1.16	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.422	1.736	0.140	0.000	0.000	0.000	0.000	0.000

Problem 440	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	29	31	27	30	0	133	0	29
N.S.	1	1.00	1.07	0.93	1.03	0.00	4.59	0.00	1.00
time (sec)	N/A	0.825	1.258	0.266	1.256	0.000	5.704	0.000	0.160

Problem 441	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	F	C	F(-2)	F(-2)	F	A	F(-1)
verified	N/A	Yes	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	0	47	0	0	0	46	0
N.S.	1	1.00	0.00	1.12	0.00	0.00	0.00	1.10	0.00
time (sec)	N/A	0.093	0.000	0.384	0.000	0.000	0.000	0.436	0.000

Problem 442	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	227	227	166	0	0	0	0	0	0
N.S.	1	1.00	0.73	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.185	0.202	0.000	0.000	0.000	0.000	0.000	0.000

Problem 443	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	130	130	138	0	0	0	0	0	0
N.S.	1	1.00	1.06	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.082	0.049	0.000	0.000	0.000	0.000	0.000	0.000

Problem 444	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	44	44	38	0	0	0	0	0
N.S.	1	1.00	1.00	0.86	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.027	0.068	0.145	0.000	0.000	0.000	0.000	0.000

Problem 445	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	20	0	0	26	22	22
N.S.	1	1.00	1.08	0.83	0.00	0.00	1.08	0.92	0.92
time (sec)	N/A	0.060	1.839	0.246	0.000	0.000	2.599	0.656	0.132

Problem 446	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	20	0	0	26	22	22
N.S.	1	1.00	1.08	0.83	0.00	0.00	1.08	0.92	0.92
time (sec)	N/A	0.128	2.580	0.279	0.000	0.000	22.746	0.715	0.134

Problem 447	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	363	363	186	0	0	0	0	0	0
N.S.	1	1.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.296	0.428	0.000	0.000	0.000	0.000	0.000	0.000

Problem 448	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	219	219	144	0	0	0	0	0	0
N.S.	1	1.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.153	0.065	0.000	0.000	0.000	0.000	0.000	0.000

Problem 449	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	44	44	38	0	0	0	0	0
N.S.	1	1.00	1.00	0.86	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.029	0.085	0.156	0.000	0.000	0.000	0.000	0.000

Problem 450	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	20	0	0	26	22	22
N.S.	1	1.00	1.08	0.83	0.00	0.00	1.08	0.92	0.92
time (sec)	N/A	0.062	2.195	0.207	0.000	0.000	16.066	0.804	0.130

Problem 451	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	431	431	180	0	0	0	0	0	0
N.S.	1	1.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.411	0.338	0.000	0.000	0.000	0.000	0.000	0.000

Problem 452	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	247	247	140	0	0	0	0	0	0
N.S.	1	1.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.173	0.058	0.000	0.000	0.000	0.000	0.000	0.000

Problem 453	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	44	44	38	0	0	0	0	0
N.S.	1	1.00	1.00	0.86	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.028	0.067	0.133	0.000	0.000	0.000	0.000	0.000

Problem 454	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	F(-2)	F(-1)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	20	0	0	0	22	22
N.S.	1	1.00	1.08	0.83	0.00	0.00	0.00	0.92	0.92
time (sec)	N/A	0.060	3.472	0.227	0.000	0.000	0.000	0.846	0.129

Problem 455	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	226	226	183	0	0	0	0	0	0
N.S.	1	1.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.173	0.199	0.000	0.000	0.000	0.000	0.000	0.000

Problem 456	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	126	126	148	0	0	0	0	0	0
N.S.	1	1.00	1.17	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.078	0.062	0.000	0.000	0.000	0.000	0.000	0.000

Problem 457	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	42	38	0	36	0	15	0
N.S.	1	1.00	1.00	0.90	0.00	0.86	0.00	0.36	0.00
time (sec)	N/A	0.022	0.026	0.171	0.000	0.247	0.000	0.302	0.000

Problem 458	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	20	0	0	20	22	22
N.S.	1	1.00	1.08	0.83	0.00	0.00	0.83	0.92	0.92
time (sec)	N/A	0.053	2.875	0.256	0.000	0.000	2.417	0.765	0.124

Problem 459	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	20	0	0	20	22	22
N.S.	1	1.00	1.08	0.83	0.00	0.00	0.83	0.92	0.92
time (sec)	N/A	0.113	3.066	0.270	0.000	0.000	25.898	0.790	0.127

Problem 460	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	359	359	209	0	0	0	0	0	0
N.S.	1	1.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.302	0.425	0.000	0.000	0.000	0.000	0.000	0.000

Problem 461	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	215	215	154	0	0	0	0	0	0
N.S.	1	1.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.168	0.063	0.000	0.000	0.000	0.000	0.000	0.000

Problem 462	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	42	38	0	38	0	15	0
N.S.	1	1.00	1.00	0.90	0.00	0.90	0.00	0.36	0.00
time (sec)	N/A	0.022	0.032	0.156	0.000	0.232	0.000	0.283	0.000

Problem 463	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	20	0	0	20	22	22
N.S.	1	1.00	1.08	0.83	0.00	0.00	0.83	0.92	0.92
time (sec)	N/A	0.053	3.122	0.207	0.000	0.000	15.883	0.897	0.126

Problem 464	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F(-2)	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	25	25	53	20	0	0	0	37	0
N.S.	1	1.00	2.12	0.80	0.00	0.00	0.00	1.48	0.00
time (sec)	N/A	0.042	0.064	0.329	0.000	0.000	0.000	0.312	0.000

Problem 465	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	244	244	336	0	0	0	0	0	0
N.S.	1	1.00	1.38	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.109	0.557	0.000	0.000	0.000	0.000	0.000	0.000

Problem 466	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	170	170	182	0	0	0	0	0	0
N.S.	1	1.00	1.07	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.089	0.283	0.000	0.000	0.000	0.000	0.000	0.000

Problem 467	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	99	99	118	0	0	0	0	0	0
N.S.	1	1.00	1.19	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.063	0.177	0.000	0.000	0.000	0.000	0.000	0.000

Problem 468	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	42	38	0	0	0	0	0
N.S.	1	1.00	1.00	0.90	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.031	0.070	0.160	0.000	0.000	0.000	0.000	0.000

Problem 469	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	20	0	0	27	22	22
N.S.	1	1.00	1.08	0.83	0.00	0.00	1.12	0.92	0.92
time (sec)	N/A	0.031	2.196	0.214	0.000	0.000	6.185	0.504	0.134

Problem 470	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	20	0	0	27	22	22
N.S.	1	1.00	1.08	0.83	0.00	0.00	1.12	0.92	0.92
time (sec)	N/A	0.032	2.603	0.268	0.000	0.000	60.970	0.521	0.133

Problem 471	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	237	237	404	0	0	0	0	0	0
N.S.	1	1.00	1.70	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.148	0.850	0.000	0.000	0.000	0.000	0.000	0.000

Problem 472	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	163	163	211	0	0	0	0	0	0
N.S.	1	1.00	1.29	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.108	0.382	0.000	0.000	0.000	0.000	0.000	0.000

Problem 473	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	98	98	83	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.062	0.222	0.000	0.000	0.000	0.000	0.000	0.000

Problem 474	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	42	38	0	48	0	0	0
N.S.	1	1.00	1.00	0.90	0.00	1.14	0.00	0.00	0.00
time (sec)	N/A	0.033	0.067	0.145	0.000	0.245	0.000	0.000	0.000

Problem 475	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	20	0	0	27	22	22
N.S.	1	1.00	1.08	0.83	0.00	0.00	1.12	0.92	0.92
time (sec)	N/A	0.066	2.459	0.223	0.000	0.000	39.649	0.548	0.138

Problem 476	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	F(-2)	F(-1)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	20	0	0	0	22	22
N.S.	1	1.00	1.08	0.83	0.00	0.00	0.00	0.92	0.92
time (sec)	N/A	0.070	2.484	0.284	0.000	0.000	0.000	0.574	0.140

Problem 477	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	206	206	251	0	0	0	0	0	0
N.S.	1	1.00	1.22	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.224	1.050	0.000	0.000	0.000	0.000	0.000	0.000

Problem 478	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	130	130	142	0	0	0	0	0	0
N.S.	1	1.00	1.09	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.084	0.429	0.000	0.000	0.000	0.000	0.000	0.000

Problem 479	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	44	44	38	0	48	0	0	0
N.S.	1	1.00	1.00	0.86	0.00	1.09	0.00	0.00	0.00
time (sec)	N/A	0.032	0.063	0.164	0.000	0.247	0.000	0.000	0.000

Problem 480	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	F(-2)	F(-1)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	20	0	0	0	22	22
N.S.	1	1.00	1.08	0.83	0.00	0.00	0.00	0.92	0.92
time (sec)	N/A	0.060	2.174	0.243	0.000	0.000	0.000	0.576	0.142

Problem 481	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	F(-2)	F(-1)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	20	0	0	0	22	22
N.S.	1	1.00	1.08	0.83	0.00	0.00	0.00	0.92	0.92
time (sec)	N/A	0.068	2.387	0.298	0.000	0.000	0.000	0.582	0.134

Problem 482	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	259	259	191	0	0	0	0	0	0
N.S.	1	1.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.240	0.645	0.000	0.000	0.000	0.000	0.000	0.000

Problem 483	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	391	391	272	0	0	0	0	0	0
N.S.	1	1.00	0.70	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.264	0.669	0.000	0.000	0.000	0.000	0.000	0.000

Problem 484	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	259	259	182	0	0	0	0	0	0
N.S.	1	1.00	0.70	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.160	0.643	0.000	0.000	0.000	0.000	0.000	0.000

Problem 485	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	29	31	27	29	29	29	0	29
N.S.	1	1.00	1.07	0.93	1.00	1.00	1.00	0.00	1.00
time (sec)	N/A	0.341	0.299	0.343	0.689	0.263	2.378	0.000	0.145

Problem 486	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	29	31	27	29	29	31	0	29
N.S.	1	1.00	1.07	0.93	1.00	1.00	1.07	0.00	1.00
time (sec)	N/A	0.242	0.338	0.184	0.694	0.272	4.498	0.000	0.152

Problem 487	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	684	684	509	0	0	0	0	0	0
N.S.	1	1.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.433	2.791	0.000	0.000	0.000	0.000	0.000	0.000

Problem 488	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	595	595	464	0	0	0	0	0	0
N.S.	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.345	1.554	0.000	0.000	0.000	0.000	0.000	0.000

Problem 489	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	466	466	327	0	0	0	0	0	0
N.S.	1	1.00	0.70	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.235	1.459	0.000	0.000	0.000	0.000	0.000	0.000

Problem 490	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	29	31	27	29	29	29	0	29
N.S.	1	1.00	1.07	0.93	1.00	1.00	1.00	0.00	1.00
time (sec)	N/A	0.665	0.329	0.181	0.791	0.265	126.658	0.000	0.149

Problem 491	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	29	31	27	29	29	0	0	29
N.S.	1	1.00	1.07	0.93	1.00	1.00	0.00	0.00	1.00
time (sec)	N/A	0.501	1.045	0.185	0.791	0.269	0.000	0.000	0.143

Problem 492	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	906	906	989	0	0	0	0	0	0
N.S.	1	1.00	1.09	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.521	3.377	0.000	0.000	0.000	0.000	0.000	0.000

Problem 493	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	815	815	603	0	0	0	0	0	0
N.S.	1	1.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.424	2.819	0.000	0.000	0.000	0.000	0.000	0.000

Problem 494	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	698	698	477	0	0	0	0	0	0
N.S.	1	1.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.322	3.819	0.000	0.000	0.000	0.000	0.000	0.000

Problem 495	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	29	31	27	29	54	0	0	29
N.S.	1	1.00	1.07	0.93	1.00	1.86	0.00	0.00	1.00
time (sec)	N/A	1.058	0.315	0.184	0.907	0.265	0.000	0.000	0.141

Problem 496	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	29	31	27	29	54	0	0	29
N.S.	1	1.00	1.07	0.93	1.00	1.86	0.00	0.00	1.00
time (sec)	N/A	0.811	0.683	0.201	0.904	0.260	0.000	0.000	0.143

Problem 497	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	F(-1)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	22	0	36	26	0	24
N.S.	1	1.00	1.08	0.92	0.00	1.50	1.08	0.00	1.00
time (sec)	N/A	0.069	0.546	0.242	0.000	0.262	4.016	0.000	0.129

Problem 498	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	163	163	153	0	0	0	0	0	0
N.S.	1	1.00	0.94	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.164	0.236	0.000	0.000	0.000	0.000	0.000	0.000

Problem 499	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	109	109	109	0	0	0	0	0	0
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.131	0.198	0.000	0.000	0.000	0.000	0.000	0.000

Problem 500	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	75	75	70	0	0	0	0	0	0
N.S.	1	1.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.074	0.059	0.000	0.000	0.000	0.000	0.000	0.000

Problem 501	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	17	17	17	18	17	18	34	17	33
N.S.	1	1.00	1.00	1.06	1.00	1.06	2.00	1.00	1.94
time (sec)	N/A	0.024	0.008	0.177	0.281	0.275	0.341	0.313	0.340

Problem 502	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	22	0	35	24	24	24
N.S.	1	1.00	1.08	0.92	0.00	1.46	1.00	1.00	1.00
time (sec)	N/A	0.063	2.812	0.112	0.000	0.260	0.719	0.348	0.128

Problem 503	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	24	26	22	0	37	26	24	24
N.S.	1	1.00	1.08	0.92	0.00	1.54	1.08	1.00	1.00
time (sec)	N/A	0.063	0.860	0.121	0.000	0.258	1.084	0.338	0.125

Problem 504	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	376	376	293	0	0	0	0	0	0
N.S.	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.348	2.689	0.000	0.000	0.000	0.000	0.000	0.000

Problem 505	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	273	273	260	0	0	0	0	0	0
N.S.	1	1.00	0.95	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.222	1.883	0.000	0.000	0.000	0.000	0.000	0.000

Problem 506	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	134	134	207	0	0	0	0	0	0
N.S.	1	1.00	1.54	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.116	1.033	0.000	0.000	0.000	0.000	0.000	0.000

Problem 507	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	141	141	200	0	0	0	0	0	0
N.S.	1	1.00	1.42	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.182	1.621	0.000	0.000	0.000	0.000	0.000	0.000

Problem 508	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	162	162	248	0	0	0	0	0	0
N.S.	1	1.00	1.53	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.252	2.448	0.000	0.000	0.000	0.000	0.000	0.000

Problem 509	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	A	A	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	163	163	114	0	215	520	0	0	0
N.S.	1	1.00	0.70	0.00	1.32	3.19	0.00	0.00	0.00
time (sec)	N/A	0.188	1.854	0.000	0.296	0.318	0.000	0.000	0.000

Problem 510	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	414	414	305	0	0	0	0	0	0
N.S.	1	1.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.270	2.736	0.000	0.000	0.000	0.000	0.000	0.000

Problem 511	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	226	226	247	0	0	0	0	0	0
N.S.	1	1.00	1.09	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.159	2.280	0.000	0.000	0.000	0.000	0.000	0.000

Problem 512	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	273	273	260	0	0	0	0	0	0
N.S.	1	1.00	0.95	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.217	2.173	0.000	0.000	0.000	0.000	0.000	0.000

Problem 513	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	242	242	238	0	0	0	0	0	0
N.S.	1	1.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.294	5.212	0.000	0.000	0.000	0.000	0.000	0.000

Problem 514	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	252	252	291	0	0	0	0	0	0
N.S.	1	1.00	1.15	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.292	6.939	0.000	0.000	0.000	0.000	0.000	0.000

Problem 515	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	324	324	599	0	0	0	0	0	0
N.S.	1	1.00	1.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.256	8.143	0.000	0.000	0.000	0.000	0.000	0.000

Problem 516	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	315	315	303	0	0	0	0	0	0
N.S.	1	1.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.192	3.063	0.000	0.000	0.000	0.000	0.000	0.000

Problem 517	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	414	414	305	0	0	0	0	0	0
N.S.	1	1.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.262	2.637	0.000	0.000	0.000	0.000	0.000	0.000

Problem 518	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	376	376	293	0	0	0	0	0	0
N.S.	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.377	2.316	0.000	0.000	0.000	0.000	0.000	0.000

Problem 519	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	345	345	274	0	0	0	0	0	0
N.S.	1	1.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.395	6.202	0.000	0.000	0.000	0.000	0.000	0.000

Problem 520	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	465	465	685	0	0	0	0	0	0
N.S.	1	1.00	1.47	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.259	7.793	0.000	0.000	0.000	0.000	0.000	0.000

Problem 521	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	420	420	847	0	0	0	0	0	0
N.S.	1	1.00	2.02	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.275	9.973	0.000	0.000	0.000	0.000	0.000	0.000

Problem 522	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	345	345	270	0	0	0	0	0	0
N.S.	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.392	4.222	0.000	0.000	0.000	0.000	0.000	0.000

Problem 523	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	242	242	238	0	0	0	0	0	0
N.S.	1	1.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.290	3.640	0.000	0.000	0.000	0.000	0.000	0.000

Problem 524	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	141	141	200	0	0	0	0	0	0
N.S.	1	1.00	1.42	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.180	1.558	0.000	0.000	0.000	0.000	0.000	0.000

Problem 525	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	55	55	110	0	32	0	0	0	0
N.S.	1	1.00	2.00	0.00	0.58	0.00	0.00	0.00	0.00
time (sec)	N/A	0.099	1.202	0.000	0.286	0.000	0.000	0.000	0.000

Problem 526	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	A	A	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	99	99	79	0	96	348	0	0	0
N.S.	1	1.00	0.80	0.00	0.97	3.52	0.00	0.00	0.00
time (sec)	N/A	0.147	0.822	0.000	0.288	0.314	0.000	0.000	0.000

Problem 527	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	A	A	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	265	265	118	0	223	525	0	0	0
N.S.	1	1.00	0.45	0.00	0.84	1.98	0.00	0.00	0.00
time (sec)	N/A	0.205	0.965	0.000	0.289	0.347	0.000	0.000	0.000

Problem 528	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	463	463	768	0	0	0	0	0	0
N.S.	1	1.00	1.66	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.262	6.113	0.000	0.000	0.000	0.000	0.000	0.000

Problem 529	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	252	252	514	0	0	0	0	0	0
N.S.	1	1.00	2.04	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.302	5.333	0.000	0.000	0.000	0.000	0.000	0.000

Problem 530	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	162	162	281	0	0	0	0	0	0
N.S.	1	1.00	1.73	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.236	2.357	0.000	0.000	0.000	0.000	0.000	0.000

Problem 531	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	A	A	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	98	98	106	0	98	354	0	0	0
N.S.	1	1.00	1.08	0.00	1.00	3.61	0.00	0.00	0.00
time (sec)	N/A	0.147	0.918	0.000	0.304	0.307	0.000	0.000	0.000

Problem 532	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	96	96	105	0	86	0	0	0	0
N.S.	1	1.00	1.09	0.00	0.90	0.00	0.00	0.00	0.00
time (sec)	N/A	0.116	1.127	0.000	0.292	0.000	0.000	0.000	0.000

Problem 533	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	A	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	255	255	180	0	234	0	0	0	0
N.S.	1	1.00	0.71	0.00	0.92	0.00	0.00	0.00	0.00
time (sec)	N/A	0.174	1.329	0.000	0.310	0.000	0.000	0.000	0.000

Problem 534	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	419	419	850	0	0	0	0	0	0
N.S.	1	1.00	2.03	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.259	7.250	0.000	0.000	0.000	0.000	0.000	0.000

Problem 535	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	324	324	601	0	0	0	0	0	0
N.S.	1	1.00	1.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.238	6.745	0.000	0.000	0.000	0.000	0.000	0.000

Problem 536	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	A	A	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	164	164	126	0	217	520	0	0	0
N.S.	1	1.00	0.77	0.00	1.32	3.17	0.00	0.00	0.00
time (sec)	N/A	0.173	1.476	0.000	0.292	0.346	0.000	0.000	0.000

Problem 537	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	A	A	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	265	265	130	0	227	527	0	0	0
N.S.	1	1.00	0.49	0.00	0.86	1.99	0.00	0.00	0.00
time (sec)	N/A	0.206	1.037	0.000	0.302	0.338	0.000	0.000	0.000

Problem 538	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	A	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	255	255	184	0	237	0	0	0	0
N.S.	1	1.00	0.72	0.00	0.93	0.00	0.00	0.00	0.00
time (sec)	N/A	0.183	1.708	0.000	0.313	0.000	0.000	0.000	0.000

Problem 539	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	A	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	188	188	178	0	177	0	0	0	0
N.S.	1	1.00	0.95	0.00	0.94	0.00	0.00	0.00	0.00
time (sec)	N/A	0.148	1.239	0.000	0.288	0.000	0.000	0.000	0.000

Problem 540	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	613	613	555	0	0	0	0	0	0
N.S.	1	1.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.681	3.768	0.000	0.000	0.000	0.000	0.000	0.000

Problem 541	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	455	455	437	0	0	0	0	0	0
N.S.	1	1.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.392	3.092	0.000	0.000	0.000	0.000	0.000	0.000

Problem 542	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	222	222	288	0	0	0	0	0	0
N.S.	1	1.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.201	1.831	0.000	0.000	0.000	0.000	0.000	0.000

Problem 543	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	230	230	296	0	0	0	0	0	0
N.S.	1	1.00	1.29	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.309	2.969	0.000	0.000	0.000	0.000	0.000	0.000

Problem 544	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	530	530	547	0	0	0	0	0	0
N.S.	1	1.00	1.03	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.650	5.331	0.000	0.000	0.000	0.000	0.000	0.000

Problem 545	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	486	486	527	0	0	0	0	0	0
N.S.	1	1.00	1.08	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.739	9.324	0.000	0.000	0.000	0.000	0.000	0.000

Problem 546	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	697	697	574	0	0	0	0	0	0
N.S.	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.567	4.380	0.000	0.000	0.000	0.000	0.000	0.000

Problem 547	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	362	362	373	0	0	0	0	0	0
N.S.	1	1.00	1.03	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.289	3.134	0.000	0.000	0.000	0.000	0.000	0.000

Problem 548	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	455	455	440	0	0	0	0	0	0
N.S.	1	1.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.394	2.901	0.000	0.000	0.000	0.000	0.000	0.000

Problem 549	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	398	398	358	0	0	0	0	0	0
N.S.	1	1.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.383	9.067	0.000	0.000	0.000	0.000	0.000	0.000

Problem 550	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	714	714	1086	0	0	0	0	0	0
N.S.	1	1.00	1.52	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.722	12.923	0.000	0.000	0.000	0.000	0.000	0.000

Problem 551	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	544	544	1438	0	0	0	0	0	0
N.S.	1	1.00	2.64	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.792	18.457	0.000	0.000	0.000	0.000	0.000	0.000

Problem 552	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	502	502	450	0	0	0	0	0	0
N.S.	1	1.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.366	4.173	0.000	0.000	0.000	0.000	0.000	0.000

Problem 553	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	697	697	574	0	0	0	0	0	0
N.S.	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.524	4.542	0.000	0.000	0.000	0.000	0.000	0.000

Problem 554	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	613	613	555	0	0	0	0	0	0
N.S.	1	1.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.691	3.430	0.000	0.000	0.000	0.000	0.000	0.000

Problem 555	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	559	559	473	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.476	13.341	0.000	0.000	0.000	0.000	0.000	0.000

Problem 556	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	918	918	1642	0	0	0	0	0	0
N.S.	1	1.00	1.79	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.890	21.901	0.000	0.000	0.000	0.000	0.000	0.000

Problem 557	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	729	729	2338	0	0	0	0	0	0
N.S.	1	1.00	3.21	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.888	24.668	0.000	0.000	0.000	0.000	0.000	0.000

Problem 558	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	559	559	434	0	0	0	0	0	0
N.S.	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.458	9.929	0.000	0.000	0.000	0.000	0.000	0.000

Problem 559	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	398	398	344	0	0	0	0	0	0
N.S.	1	1.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.373	5.762	0.000	0.000	0.000	0.000	0.000	0.000

Problem 560	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	231	231	298	0	0	0	0	0	0
N.S.	1	1.00	1.29	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.290	2.317	0.000	0.000	0.000	0.000	0.000	0.000

Problem 561	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	55	55	159	0	0	0	0	0	0
N.S.	1	1.00	2.89	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.161	2.668	0.000	0.000	0.000	0.000	0.000	0.000

Problem 562	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	455	455	225	0	0	0	0	0	0
N.S.	1	1.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.435	2.720	0.000	0.000	0.000	0.000	0.000	0.000

Problem 563	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	896	896	369	0	0	0	0	0	0
N.S.	1	1.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.830	8.369	0.000	0.000	0.000	0.000	0.000	0.000

Problem 564	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	918	918	2041	0	0	0	0	0	0
N.S.	1	1.00	2.22	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.839	20.326	0.000	0.000	0.000	0.000	0.000	0.000

Problem 565	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	713	713	1255	0	0	0	0	0	0
N.S.	1	1.00	1.76	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.698	15.842	0.000	0.000	0.000	0.000	0.000	0.000

Problem 566	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	530	530	513	0	0	0	0	0	0
N.S.	1	1.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.624	6.726	0.000	0.000	0.000	0.000	0.000	0.000

Problem 567	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	454	454	221	0	0	0	0	0	0
N.S.	1	1.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.450	3.248	0.000	0.000	0.000	0.000	0.000	0.000

Problem 568	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	217	217	550	0	0	0	0	0	0
N.S.	1	1.00	2.53	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.269	4.467	0.000	0.000	0.000	0.000	0.000	0.000

Problem 569	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	709	709	739	0	0	0	0	0	0
N.S.	1	1.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.606	10.313	0.000	0.000	0.000	0.000	0.000	0.000

Problem 570	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	730	730	2312	0	0	0	0	0	0
N.S.	1	1.00	3.17	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.864	21.097	0.000	0.000	0.000	0.000	0.000	0.000

Problem 571	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	544	544	1419	0	0	0	0	0	0
N.S.	1	1.00	2.61	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.777	15.571	0.000	0.000	0.000	0.000	0.000	0.000

Problem 572	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	486	486	687	0	0	0	0	0	0
N.S.	1	1.00	1.41	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.726	10.900	0.000	0.000	0.000	0.000	0.000	0.000

Problem 573	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	896	896	388	0	0	0	0	0	0
N.S.	1	1.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.819	6.544	0.000	0.000	0.000	0.000	0.000	0.000

Problem 574	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	709	709	764	0	0	0	0	0	0
N.S.	1	1.00	1.08	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.567	9.899	0.000	0.000	0.000	0.000	0.000	0.000

Problem 575	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD
size	366	366	722	0	0	0	0	0	0
N.S.	1	1.00	1.97	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.324	10.855	0.000	0.000	0.000	0.000	0.000	0.000

Problem 576	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	351	351	297	0	0	0	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.484	1.304	0.000	0.000	0.000	0.000	0.000	0.000

Problem 577	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	A	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	225	225	178	0	0	197	0	0	0
N.S.	1	1.00	0.79	0.00	0.00	0.88	0.00	0.00	0.00
time (sec)	N/A	0.262	1.311	0.000	0.000	0.272	0.000	0.000	0.000

Problem 578	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	222	222	288	0	0	0	0	0	0
N.S.	1	1.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.203	0.445	0.000	0.000	0.000	0.000	0.000	0.000

Problem 579	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	432	432	434	0	0	0	0	0	0
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.480	2.247	0.000	0.000	0.000	0.000	0.000	0.000

Problem 580	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	257	257	374	0	0	0	0	0	0
N.S.	1	1.00	1.46	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.414	1.347	0.000	0.000	0.000	0.000	0.000	0.000

Problem 581	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	509	509	452	0	0	0	0	0	0
N.S.	1	1.00	0.89	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.699	2.255	0.000	0.000	0.000	0.000	0.000	0.000

Problem 582	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	A	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	338	338	207	0	0	302	0	0	0
N.S.	1	1.00	0.61	0.00	0.00	0.89	0.00	0.00	0.00
time (sec)	N/A	0.350	2.305	0.000	0.000	0.297	0.000	0.000	0.000

Problem 583	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	362	362	373	0	0	0	0	0	0
N.S.	1	1.00	1.03	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.299	0.917	0.000	0.000	0.000	0.000	0.000	0.000

Problem 584	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	647	647	632	0	0	0	0	0	0
N.S.	1	1.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.648	5.081	0.000	0.000	0.000	0.000	0.000	0.000

Problem 585	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	505	505	538	0	0	0	0	0	0
N.S.	1	1.00	1.07	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.543	3.068	0.000	0.000	0.000	0.000	0.000	0.000

Problem 586	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	250	250	326	0	0	0	0	0	0
N.S.	1	1.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.383	1.470	0.000	0.000	0.000	0.000	0.000	0.000

Problem 587	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	A	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	177	177	150	0	0	138	0	0	0
N.S.	1	1.00	0.85	0.00	0.00	0.78	0.00	0.00	0.00
time (sec)	N/A	0.249	1.952	0.000	0.000	0.266	0.000	0.000	0.000

Problem 588	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	55	55	159	0	0	0	0	0	0
N.S.	1	1.00	2.89	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.162	0.224	0.000	0.000	0.000	0.000	0.000	0.000

Problem 589	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	287	287	336	0	0	0	0	0	0
N.S.	1	1.00	1.17	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.397	2.615	0.000	0.000	0.000	0.000	0.000	0.000

Problem 590	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	214	214	189	0	0	0	0	0	0
N.S.	1	1.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.399	2.670	0.000	0.000	0.000	0.000	0.000	0.000

Problem 591	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	295	295	636	0	0	0	0	0	0
N.S.	1	1.00	2.16	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.510	3.431	0.000	0.000	0.000	0.000	0.000	0.000

Problem 592	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	244	244	453	0	0	0	0	0	0
N.S.	1	1.00	1.86	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.349	3.780	0.000	0.000	0.000	0.000	0.000	0.000

Problem 593	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	B	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	217	217	550	0	0	0	0	0	0
N.S.	1	1.00	2.53	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.262	0.691	0.000	0.000	0.000	0.000	0.000	0.000

Problem 594	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	548	548	877	0	0	0	0	0	0
N.S.	1	1.00	1.60	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.601	6.474	0.000	0.000	0.000	0.000	0.000	0.000

Problem 595	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	396	396	564	0	0	0	0	0	0
N.S.	1	1.00	1.42	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.597	4.395	0.000	0.000	0.000	0.000	0.000	0.000

Problem 596	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	152	152	115	194	183	128	223	316	0
N.S.	1	1.00	0.76	1.28	1.20	0.84	1.47	2.08	0.00
time (sec)	N/A	0.106	0.077	0.264	0.280	0.256	0.713	0.301	0.000

Problem 597	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	149	149	116	170	163	124	206	254	0
N.S.	1	1.00	0.78	1.14	1.09	0.83	1.38	1.70	0.00
time (sec)	N/A	0.084	0.064	0.130	0.276	0.250	0.498	0.292	0.000

Problem 598	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	120	120	96	154	142	107	172	210	0
N.S.	1	1.00	0.80	1.28	1.18	0.89	1.43	1.75	0.00
time (sec)	N/A	0.087	0.071	0.141	0.274	0.262	0.396	0.306	0.000

Problem 599	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	122	122	95	161	122	102	153	168	0
N.S.	1	1.00	0.78	1.32	1.00	0.84	1.25	1.38	0.00
time (sec)	N/A	0.061	0.047	0.199	0.272	0.250	0.334	0.291	0.000

Problem 600	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	81	81	71	100	91	82	109	109	0
N.S.	1	1.00	0.88	1.23	1.12	1.01	1.35	1.35	0.00
time (sec)	N/A	0.048	0.049	0.015	0.280	0.256	0.221	0.292	0.000

Problem 601	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	132	132	114	161	0	0	0	0	0
N.S.	1	1.00	0.86	1.22	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.162	0.153	0.668	0.000	0.000	0.000	0.000	0.000

Problem 602	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	66	66	71	79	79	103	75	1032	70
N.S.	1	1.00	1.08	1.20	1.20	1.56	1.14	15.64	1.06
time (sec)	N/A	0.050	0.046	0.022	0.263	0.281	1.996	0.516	0.375

Problem 603	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	119	119	101	181	0	0	0	0	0
N.S.	1	1.00	0.85	1.52	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.159	0.119	0.520	0.000	0.000	0.000	0.000	0.000

Problem 604	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	109	113	119	115	168	424	0
N.S.	1	1.00	1.28	1.33	1.40	1.35	1.98	4.99	0.00
time (sec)	N/A	0.059	0.034	0.026	0.283	0.296	3.430	124.077	0.000

Problem 605	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	241	241	187	329	314	219	415	598	0
N.S.	1	1.00	0.78	1.37	1.30	0.91	1.72	2.48	0.00
time (sec)	N/A	0.222	0.133	0.473	0.278	0.256	1.300	0.310	0.000

Problem 606	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	241	241	190	293	284	215	382	498	0
N.S.	1	1.00	0.79	1.22	1.18	0.89	1.59	2.07	0.00
time (sec)	N/A	0.174	0.120	0.269	0.274	0.262	1.008	0.295	0.000

Problem 607	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	198	198	158	269	253	186	333	429	0
N.S.	1	1.00	0.80	1.36	1.28	0.94	1.68	2.17	0.00
time (sec)	N/A	0.151	0.127	0.354	0.278	0.262	0.673	0.282	0.000

Problem 608	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	183	159	253	223	183	299	350	0
N.S.	1	1.00	0.87	1.38	1.22	1.00	1.63	1.91	0.00
time (sec)	N/A	0.121	0.112	0.257	0.275	0.259	0.586	0.283	0.000

Problem 609	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	125	194	182	151	240	265	0
N.S.	1	1.00	0.83	1.29	1.21	1.01	1.60	1.77	0.00
time (sec)	N/A	0.096	0.124	0.189	0.283	0.258	0.415	0.292	0.000

Problem 610	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	229	229	218	240	0	0	0	0	0
N.S.	1	1.00	0.95	1.05	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.222	0.236	0.425	0.000	0.000	0.000	0.000	0.000

Problem 611	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	126	129	157	151	172	168	4243	0
N.S.	1	1.00	1.02	1.25	1.20	1.37	1.33	33.67	0.00
time (sec)	N/A	0.122	0.113	0.195	0.280	0.304	2.468	2.099	0.000

Problem 612	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	185	185	184	246	0	0	0	0	0
N.S.	1	1.00	0.99	1.33	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.228	0.286	0.615	0.000	0.000	0.000	0.000	0.000

Problem 613	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	126	140	156	159	174	218	2534	0
N.S.	1	1.00	1.11	1.24	1.26	1.38	1.73	20.11	0.00
time (sec)	N/A	0.138	0.116	0.218	0.275	0.311	3.416	1.633	0.000

Problem 614	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	341	341	271	484	465	322	631	943	0
N.S.	1	1.00	0.79	1.42	1.36	0.94	1.85	2.77	0.00
time (sec)	N/A	0.290	0.210	0.254	0.280	0.276	2.346	0.316	0.000

Problem 615	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	380	380	276	436	425	318	597	807	0
N.S.	1	1.00	0.73	1.15	1.12	0.84	1.57	2.12	0.00
time (sec)	N/A	0.345	0.175	0.249	0.273	0.268	1.858	0.308	0.000

Problem 616	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	287	287	231	404	384	277	525	711	0
N.S.	1	1.00	0.80	1.41	1.34	0.97	1.83	2.48	0.00
time (sec)	N/A	0.254	0.160	0.267	0.285	0.264	1.234	0.300	0.000

Problem 617	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	258	258	232	365	344	274	483	597	0
N.S.	1	1.00	0.90	1.41	1.33	1.06	1.87	2.31	0.00
time (sec)	N/A	0.183	0.144	0.463	0.278	0.257	0.949	0.295	0.000

Problem 618	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	225	225	187	305	292	229	389	480	0
N.S.	1	1.00	0.83	1.36	1.30	1.02	1.73	2.13	0.00
time (sec)	N/A	0.168	0.174	0.198	0.279	0.256	0.671	0.316	0.000

Problem 619	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	357	357	322	341	0	0	0	0	0
N.S.	1	1.00	0.90	0.96	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.315	0.378	0.395	0.000	0.000	0.000	0.000	0.000

Problem 620	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	190	190	183	250	241	239	275	10769	0
N.S.	1	1.00	0.96	1.32	1.27	1.26	1.45	56.68	0.00
time (sec)	N/A	0.193	0.140	0.200	0.269	0.317	3.102	11.899	0.000

Problem 621	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	262	262	262	357	0	0	0	0	0
N.S.	1	1.00	1.00	1.36	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.523	0.317	0.622	0.000	0.000	0.000	0.000	0.000

Problem 622	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	186	186	194	235	231	246	311	7971	0
N.S.	1	1.00	1.04	1.26	1.24	1.32	1.67	42.85	0.00
time (sec)	N/A	0.217	0.179	0.215	0.269	0.350	3.943	8.382	0.000

Problem 623	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	317	317	260	440	424	321	593	766	0
N.S.	1	1.00	0.82	1.39	1.34	1.01	1.87	2.42	0.00
time (sec)	N/A	0.230	0.232	0.213	0.273	0.253	1.251	0.300	0.000

Problem 624	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	653	653	515	376	0	0	0	0	0
N.S.	1	1.00	0.79	0.58	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.758	0.670	13.195	0.000	0.000	0.000	0.000	0.000

Problem 625	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	559	559	475	2088	0	0	0	0	0
N.S.	1	1.00	0.85	3.74	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.599	0.300	2.302	0.000	0.000	0.000	0.000	0.000

Problem 626	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F(-2)	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	579	579	456	285	0	0	0	0	0
N.S.	1	1.00	0.79	0.49	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.610	0.291	8.654	0.000	0.000	0.000	0.000	0.000

Problem 627	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	491	491	399	1965	0	0	0	0	0
N.S.	1	1.00	0.81	4.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.500	0.131	0.589	0.000	0.000	0.000	0.000	0.000

Problem 628	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	541	541	490	236	0	0	0	0	0
N.S.	1	1.00	0.91	0.44	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.502	0.338	0.987	0.000	0.000	0.000	0.000	0.000

Problem 629	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	518	518	430	344	0	0	0	0	0
N.S.	1	1.00	0.83	0.66	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.633	0.147	1.657	0.000	0.000	0.000	0.000	0.000

Problem 630	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	579	579	455	363	0	0	0	0	0
N.S.	1	1.00	0.79	0.63	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.631	0.271	5.685	0.000	0.000	0.000	0.000	0.000

Problem 631	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	573	573	509	421	0	0	0	0	0
N.S.	1	1.00	0.89	0.73	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.689	0.203	1.842	0.000	0.000	0.000	0.000	0.000

Problem 632	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	649	649	531	491	0	0	0	0	0
N.S.	1	1.00	0.82	0.76	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.682	0.298	6.283	0.000	0.000	0.000	0.000	0.000

Problem 633	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	574	574	593	2101	0	0	0	0	0
N.S.	1	1.00	1.03	3.66	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.687	0.867	1.849	0.000	0.000	0.000	0.000	0.000

Problem 634	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F(-2)	B	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	83	87	404	0	395	0	0	0
N.S.	1	0.97	1.01	4.70	0.00	4.59	0.00	0.00	0.00
time (sec)	N/A	0.042	0.103	3.105	0.000	0.286	0.000	0.000	0.000

Problem 635	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	597	597	640	468	0	0	0	0	0
N.S.	1	1.00	1.07	0.78	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.695	0.854	1.554	0.000	0.000	0.000	0.000	0.000

Problem 636	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	632	632	687	589	0	0	0	0	0
N.S.	1	1.00	1.09	0.93	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.733	1.729	1.961	0.000	0.000	0.000	0.000	0.000

Problem 637	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	787	787	649	898	0	0	0	0	0
N.S.	1	1.00	0.82	1.14	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.420	1.117	4.870	0.000	0.000	0.000	0.000	0.000

Problem 638	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	745	745	603	811	0	0	0	0	0
N.S.	1	1.00	0.81	1.09	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.341	0.877	3.861	0.000	0.000	0.000	0.000	0.000

Problem 639	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	757	757	591	828	0	0	0	0	0
N.S.	1	1.00	0.78	1.09	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.694	1.168	4.144	0.000	0.000	0.000	0.000	0.000

Problem 640	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	795	795	672	928	0	0	0	0	0
N.S.	1	1.00	0.85	1.17	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.404	1.100	6.112	0.000	0.000	0.000	0.000	0.000

Problem 641	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	705	705	973	3508	0	0	0	0	0
N.S.	1	1.00	1.38	4.98	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.765	5.023	2.994	0.000	0.000	0.000	0.000	0.000

Problem 642	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	B	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	153	153	152	1020	0	921	0	0	0
N.S.	1	1.00	0.99	6.67	0.00	6.02	0.00	0.00	0.00
time (sec)	N/A	0.138	0.348	0.184	0.000	0.392	0.000	0.000	0.000

Problem 643	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	B	F	B	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	133	133	141	998	0	783	0	0	0
N.S.	1	1.00	1.06	7.50	0.00	5.89	0.00	0.00	0.00
time (sec)	N/A	0.060	0.353	0.213	0.000	0.366	0.000	0.000	0.000

Problem 644	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	727	727	1022	1130	0	0	0	0	0
N.S.	1	1.00	1.41	1.55	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.788	3.888	2.096	0.000	0.000	0.000	0.000	0.000

Problem 645	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	783	783	1065	1344	0	0	0	0	0
N.S.	1	1.00	1.36	1.72	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.809	5.651	2.524	0.000	0.000	0.000	0.000	0.000

Problem 646	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD
size	1082	1082	1014	1748	0	0	0	0	0
N.S.	1	1.00	0.94	1.62	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	2.410	4.469	9.729	0.000	0.000	0.000	0.000	0.000

Problem 647	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	No	No	TBD	TBD	TBD	TBD	TBD
size	1092	1092	1014	1224	0	0	0	0	0
N.S.	1	1.00	0.93	1.12	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.731	4.638	5.108	0.000	0.000	0.000	0.000	0.000

Problem 648	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	No	No	TBD	TBD	TBD	TBD	TBD
size	1092	1092	1055	1772	0	0	0	0	0
N.S.	1	1.00	0.97	1.62	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.853	6.058	5.073	0.000	0.000	0.000	0.000	0.000

Problem 649	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	20	20	22	18	0	20	19	20	20
N.S.	1	1.00	1.10	0.90	0.00	1.00	0.95	1.00	1.00
time (sec)	N/A	0.014	6.599	1.021	0.000	0.267	9.709	0.502	0.440

Problem 650	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	20	20	22	18	0	20	19	20	20
N.S.	1	1.00	1.10	0.90	0.00	1.00	0.95	1.00	1.00
time (sec)	N/A	0.015	3.230	1.266	0.000	0.262	2.885	0.372	0.400

Problem 651	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F(-2)	B	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	70	70	74	0	0	294	0	0	0
N.S.	1	1.00	1.06	0.00	0.00	4.20	0.00	0.00	0.00
time (sec)	N/A	0.062	0.094	0.000	0.000	0.277	0.000	0.000	0.000

Problem 652	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F	B	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	146	146	190	0	0	683	0	0	0
N.S.	1	1.00	1.30	0.00	0.00	4.68	0.00	0.00	0.00
time (sec)	N/A	0.104	0.187	0.000	0.000	0.315	0.000	0.000	0.000

Problem 653	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	F	F	B	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	226	226	188	0	0	1321	0	0	0
N.S.	1	1.00	0.83	0.00	0.00	5.85	0.00	0.00	0.00
time (sec)	N/A	0.548	0.308	0.000	0.000	0.368	0.000	0.000	0.000

Problem 654	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	484	455	310	0	0	0	0	0	0
N.S.	1	0.94	0.64	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.593	0.392	0.000	0.000	0.000	0.000	0.000	0.000

Problem 655	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	293	272	224	0	0	0	0	0	0
N.S.	1	0.93	0.76	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.289	0.191	0.000	0.000	0.000	0.000	0.000	0.000

Problem 656	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	161	148	122	0	0	0	0	0	0
N.S.	1	0.92	0.76	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.115	0.133	0.000	0.000	0.000	0.000	0.000	0.000

Problem 657	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	23	23	25	23	25	25	20	25	25
N.S.	1	1.00	1.09	1.00	1.09	1.09	0.87	1.09	1.09
time (sec)	N/A	0.040	2.127	2.852	0.500	0.260	10.258	0.621	0.276

Problem 658	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	23	23	25	23	25	36	0	25	25
N.S.	1	1.00	1.09	1.00	1.09	1.57	0.00	1.09	1.09
time (sec)	N/A	0.042	3.619	1.342	0.545	0.268	0.000	0.623	0.309

Problem 659	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	569	569	435	702	699	555	989	1242	0
N.S.	1	1.00	0.76	1.23	1.23	0.98	1.74	2.18	0.00
time (sec)	N/A	0.638	0.347	1.483	0.287	0.273	0.966	0.324	0.000

Problem 660	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	335	335	291	442	437	349	595	683	0
N.S.	1	1.00	0.87	1.32	1.30	1.04	1.78	2.04	0.00
time (sec)	N/A	0.369	0.221	0.299	0.290	0.259	0.537	0.320	0.000

Problem 661	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	156	156	148	221	221	177	279	285	0
N.S.	1	1.00	0.95	1.42	1.42	1.13	1.79	1.83	0.00
time (sec)	N/A	0.185	0.165	0.241	0.275	0.259	0.306	0.323	0.000

Problem 662	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	47	72	72	65	82	75	142
N.S.	1	1.00	1.00	1.53	1.53	1.38	1.74	1.60	3.02
time (sec)	N/A	0.044	0.028	0.140	0.274	0.258	0.104	0.290	0.549

Problem 663	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	821	821	1101	0	0	0	0	0	0
N.S.	1	1.00	1.34	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.910	0.607	0.000	0.000	0.000	0.000	0.000	0.000

Problem 664	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	0	34	20	22	22
N.S.	1	1.00	1.09	0.91	0.00	1.55	0.91	1.00	1.00
time (sec)	N/A	0.026	20.954	0.952	0.000	0.252	8.651	0.596	0.360

Problem 665	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	0	34	20	22	22
N.S.	1	1.00	1.09	0.91	0.00	1.55	0.91	1.00	1.00
time (sec)	N/A	0.027	9.326	1.188	0.000	0.250	3.343	0.400	0.339

Problem 666	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	0	54	20	22	22
N.S.	1	1.00	1.09	0.91	0.00	2.45	0.91	1.00	1.00
time (sec)	N/A	0.027	3.616	2.198	0.000	0.260	5.482	0.486	0.279

Problem 667	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	130	65	20	22	22
N.S.	1	1.00	1.09	0.91	5.91	2.95	0.91	1.00	1.00
time (sec)	N/A	0.027	8.989	2.138	0.497	0.279	63.417	0.569	0.304

Problem 668	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	387	387	253	310	0	0	0	633	0
N.S.	1	1.00	0.65	0.80	0.00	0.00	0.00	1.64	0.00
time (sec)	N/A	0.431	0.520	0.252	0.000	0.000	0.000	0.315	0.000

Problem 669	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	179	179	125	148	0	0	0	229	0
N.S.	1	1.00	0.70	0.83	0.00	0.00	0.00	1.28	0.00
time (sec)	N/A	0.202	0.224	0.110	0.000	0.000	0.000	0.306	0.000

Problem 670	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	A	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	53	53	44	48	0	0	0	49	0
N.S.	1	1.00	0.83	0.91	0.00	0.00	0.00	0.92	0.00
time (sec)	N/A	0.041	0.054	0.062	0.000	0.000	0.000	0.288	0.000

Problem 671	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	20	20	22	20	22	29	17	22	22
N.S.	1	1.00	1.10	1.00	1.10	1.45	0.85	1.10	1.10
time (sec)	N/A	0.025	0.750	1.283	0.348	0.229	3.295	0.448	0.233

Problem 672	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	20	20	22	20	22	53	19	22	22
N.S.	1	1.00	1.10	1.00	1.10	2.65	0.95	1.10	1.10
time (sec)	N/A	0.023	3.155	3.693	0.375	0.241	101.616	4.604	0.242

Problem 673	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	22	22	19	22	22
N.S.	1	1.00	1.09	0.91	1.00	1.00	0.86	1.00	1.00
time (sec)	N/A	0.030	1.123	1.001	0.359	0.240	0.402	0.419	0.216

Problem 674	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	22	39	20	22	22
N.S.	1	1.00	1.09	0.91	1.00	1.77	0.91	1.00	1.00
time (sec)	N/A	0.031	0.912	1.027	0.349	0.251	0.637	0.371	0.223

Problem 675	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	22	63	20	22	22
N.S.	1	1.00	1.09	0.91	1.00	2.86	0.91	1.00	1.00
time (sec)	N/A	0.032	1.587	1.131	0.357	0.249	1.756	0.360	0.219

Problem 676	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	22	87	20	22	22
N.S.	1	1.00	1.09	0.91	1.00	3.95	0.91	1.00	1.00
time (sec)	N/A	0.032	3.168	1.068	0.378	0.243	8.014	0.397	0.216

Problem 677	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	498	498	359	795	0	0	0	2337	0
N.S.	1	1.00	0.72	1.60	0.00	0.00	0.00	4.69	0.00
time (sec)	N/A	0.458	1.988	0.419	0.000	0.000	0.000	0.382	0.000

Problem 678	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	249	249	191	376	0	0	0	891	0
N.S.	1	1.00	0.77	1.51	0.00	0.00	0.00	3.58	0.00
time (sec)	N/A	0.254	0.904	0.168	0.000	0.000	0.000	0.359	0.000

Problem 679	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F	F	F	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	86	72	76	0	0	0	192	0
N.S.	1	1.00	0.84	0.88	0.00	0.00	0.00	2.23	0.00
time (sec)	N/A	0.102	0.179	0.058	0.000	0.000	0.000	0.280	0.000

Problem 680	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	20	20	22	20	320	57	19	22	22
N.S.	1	1.00	1.10	1.00	16.00	2.85	0.95	1.10	1.10
time (sec)	N/A	0.024	30.218	1.409	2.096	0.252	41.359	0.702	0.238

Problem 681	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	20	20	22	20	439	98	0	22	22
N.S.	1	1.00	1.10	1.00	21.95	4.90	0.00	1.10	1.10
time (sec)	N/A	0.024	53.026	4.264	2.633	0.253	0.000	7.937	0.235

Problem 682	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	236	36	20	22	22
N.S.	1	1.00	1.09	0.91	10.73	1.64	0.91	1.00	1.00
time (sec)	N/A	0.027	7.389	0.996	1.223	0.258	0.710	0.508	0.257

Problem 683	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	364	67	22	22	22
N.S.	1	1.00	1.09	0.91	16.55	3.05	1.00	1.00	1.00
time (sec)	N/A	0.028	15.445	1.079	1.580	0.263	1.283	0.387	0.256

Problem 684	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	457	108	22	22	22
N.S.	1	1.00	1.09	0.91	20.77	4.91	1.00	1.00	1.00
time (sec)	N/A	0.030	25.688	1.131	2.769	0.255	4.935	0.461	0.253

Problem 685	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	579	149	22	22	22
N.S.	1	1.00	1.09	0.91	26.32	6.77	1.00	1.00	1.00
time (sec)	N/A	0.030	47.125	1.177	3.961	0.260	29.060	0.508	0.256

Problem 686	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	754	754	400	1155	0	0	0	3216	0
N.S.	1	1.00	0.53	1.53	0.00	0.00	0.00	4.27	0.00
time (sec)	N/A	1.141	1.066	0.885	0.000	0.000	0.000	1.859	0.000

Problem 687	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	369	369	244	557	0	0	0	1661	0
N.S.	1	1.00	0.66	1.51	0.00	0.00	0.00	4.50	0.00
time (sec)	N/A	0.558	0.412	0.401	0.000	0.000	0.000	1.306	0.000

Problem 688	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	120	120	119	187	0	0	0	531	0
N.S.	1	1.00	0.99	1.56	0.00	0.00	0.00	4.42	0.00
time (sec)	N/A	0.148	0.058	0.156	0.000	0.000	0.000	0.563	0.000

Problem 689	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	F(-1)	N/A	F(-2)	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	0	20	0	0	19	22	22
N.S.	1	1.00	0.00	0.91	0.00	0.00	0.86	1.00	1.00
time (sec)	N/A	0.036	0.000	1.115	0.000	0.000	0.878	1.047	0.220

Problem 690	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	F(-1)	N/A	N/A	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	0	20	22	0	20	22	22
N.S.	1	1.00	0.00	0.91	1.00	0.00	0.91	1.00	1.00
time (sec)	N/A	0.034	0.000	1.233	0.626	0.000	15.452	1.276	0.241

Problem 691	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	482	482	844	850	0	0	0	2814	0
N.S.	1	1.00	1.75	1.76	0.00	0.00	0.00	5.84	0.00
time (sec)	N/A	0.825	8.612	0.415	0.000	0.000	0.000	2.041	0.000

Problem 692	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	B	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	159	159	289	278	0	0	0	993	0
N.S.	1	1.00	1.82	1.75	0.00	0.00	0.00	6.25	0.00
time (sec)	N/A	0.171	1.490	0.158	0.000	0.000	0.000	1.145	0.000

Problem 693	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	F(-1)	N/A	F(-2)	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	0	20	0	0	19	22	22
N.S.	1	1.00	0.00	0.91	0.00	0.00	0.86	1.00	1.00
time (sec)	N/A	0.044	0.000	1.014	0.000	0.000	10.828	1.068	0.224

Problem 694	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	F(-1)	N/A	N/A	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	0	20	22	0	20	22	22
N.S.	1	1.00	0.00	0.91	1.00	0.00	0.91	1.00	1.00
time (sec)	N/A	0.040	0.000	1.264	0.738	0.000	106.553	1.349	0.245

Problem 695	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	679	679	401	664	0	0	0	975	0
N.S.	1	1.00	0.59	0.98	0.00	0.00	0.00	1.44	0.00
time (sec)	N/A	0.831	1.144	0.503	0.000	0.000	0.000	0.798	0.000

Problem 696	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	329	329	246	310	0	0	0	481	0
N.S.	1	1.00	0.75	0.94	0.00	0.00	0.00	1.46	0.00
time (sec)	N/A	0.405	0.413	0.268	0.000	0.000	0.000	0.655	0.000

Problem 697	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	C	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	101	101	121	90	0	0	0	159	0
N.S.	1	1.00	1.20	0.89	0.00	0.00	0.00	1.57	0.00
time (sec)	N/A	0.064	0.057	0.024	0.000	0.000	0.000	0.370	0.000

Problem 698	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	0	0	20	22	22
N.S.	1	1.00	1.09	0.91	0.00	0.00	0.91	1.00	1.00
time (sec)	N/A	0.045	0.181	0.971	0.000	0.000	2.286	0.673	0.216

Problem 699	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	22	0	22	22	22
N.S.	1	1.00	1.09	0.91	1.00	0.00	1.00	1.00	1.00
time (sec)	N/A	0.036	0.249	1.209	0.657	0.000	45.897	0.924	0.240

Problem 700	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	394	394	417	460	0	0	0	0	0
N.S.	1	1.00	1.06	1.17	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.462	0.790	0.349	0.000	0.000	0.000	0.000	0.000

Problem 701	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	C	A	F	F(-2)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	137	167	158	0	0	0	0	0
N.S.	1	1.00	1.22	1.15	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.146	0.224	0.140	0.000	0.000	0.000	0.000	0.000

Problem 702	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	22	0	20	22	22
N.S.	1	1.00	1.09	0.91	1.00	0.00	0.91	1.00	1.00
time (sec)	N/A	0.043	0.202	1.128	0.620	0.000	12.775	0.813	0.227

Problem 703	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	N/A	N/A	N/A	N/A	F(-2)	F(-1)	F(-2)	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	22	24	20	22	0	0	0	22
N.S.	1	1.00	1.09	0.91	1.00	0.00	0.00	0.00	1.00
time (sec)	N/A	0.041	0.255	1.167	0.639	0.000	0.000	0.000	0.240

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi only. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is also given. The larger this ratio is, the harder the integral is to solve. In this test file, problem number [621] had the largest ratio of [.7619000000000000022]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	5	5	1.00	23	0.217
2	A	6	6	1.00	23	0.261
3	A	5	5	1.00	23	0.217
4	A	4	3	1.00	21	0.143
5	A	5	4	1.00	20	0.200
6	A	8	8	1.00	23	0.348
7	A	6	7	1.00	23	0.304
8	A	8	8	1.00	23	0.348
9	A	6	7	1.00	23	0.304
10	A	6	6	1.00	25	0.240
11	A	7	8	1.00	25	0.320
12	A	5	5	1.00	25	0.200
13	A	5	3	1.00	23	0.130
14	A	5	5	1.00	22	0.227
15	A	12	8	1.00	25	0.320
16	A	7	7	1.00	25	0.280
17	A	12	10	1.00	25	0.400
18	A	7	8	1.00	25	0.320
19	A	5	5	1.00	25	0.200
20	A	8	7	1.00	25	0.280
21	A	5	5	1.00	25	0.200
22	A	6	3	1.00	23	0.130
23	A	5	5	1.00	22	0.227
24	A	17	8	1.00	25	0.320

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
25	A	7	7	1.00	25	0.280
26	A	17	10	1.00	25	0.400
27	A	8	8	1.00	25	0.320
28	A	12	8	1.00	25	0.320
29	A	8	8	1.00	25	0.320
30	A	8	6	1.00	25	0.240
31	A	5	5	1.00	23	0.217
32	A	6	4	1.00	22	0.182
33	A	7	5	1.00	25	0.200
34	A	10	8	1.00	25	0.320
35	A	9	7	1.00	25	0.280
36	A	15	9	1.00	25	0.360
37	A	12	9	1.00	25	0.360
38	A	8	8	1.00	25	0.320
39	A	8	6	1.00	25	0.240
40	A	2	2	1.00	23	0.087
41	A	8	6	1.00	22	0.273
42	A	9	7	1.00	25	0.280
43	A	13	11	1.00	25	0.440
44	A	12	9	1.00	25	0.360
45	A	19	12	1.00	25	0.480
46	A	12	8	1.00	25	0.320
47	A	4	3	1.00	25	0.120
48	A	10	7	1.00	25	0.280
49	A	3	3	1.00	23	0.130
50	A	10	6	1.00	22	0.273
51	A	12	8	1.00	25	0.320
52	A	16	11	1.00	25	0.440
53	A	16	10	1.00	25	0.400
54	A	23	12	1.00	25	0.480
55	A	7	4	1.00	27	0.148
56	A	5	4	1.00	27	0.148
57	A	3	3	1.00	24	0.125
58	A	3	3	1.00	27	0.111
59	A	3	2	1.00	27	0.074

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
60	A	4	5	1.00	27	0.185
61	A	4	5	1.00	27	0.185
62	A	3	4	1.00	27	0.148
63	A	3	4	1.00	27	0.148
64	A	2	1	1.00	25	0.040
65	A	8	6	1.00	27	0.222
66	A	8	6	1.00	27	0.222
67	A	10	7	1.00	27	0.259
68	A	10	6	1.00	27	0.222
69	A	8	6	1.00	27	0.222
70	A	6	5	1.00	24	0.208
71	A	6	5	1.00	27	0.185
72	A	6	5	1.00	27	0.185
73	A	4	3	1.00	27	0.111
74	A	5	6	1.00	27	0.222
75	A	5	6	1.00	27	0.222
76	A	5	6	1.00	27	0.222
77	A	4	5	1.00	27	0.185
78	A	4	5	1.00	27	0.185
79	A	4	5	1.00	27	0.185
80	A	3	2	1.00	25	0.080
81	A	10	7	1.00	27	0.259
82	A	11	8	1.00	27	0.296
83	A	11	8	1.00	27	0.296
84	A	14	8	1.00	27	0.296
85	A	12	8	1.00	27	0.296
86	A	8	6	1.00	24	0.250
87	A	10	8	1.00	27	0.296
88	A	10	7	1.00	27	0.259
89	A	10	7	1.00	27	0.259
90	A	4	3	1.00	27	0.111
91	A	6	7	1.00	27	0.259
92	A	5	6	1.00	27	0.222
93	A	4	5	1.00	27	0.185
94	A	4	5	1.00	27	0.185

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
95	A	3	2	1.00	25	0.080
96	A	13	8	1.00	27	0.296
97	A	13	9	1.00	27	0.333
98	A	14	9	1.00	27	0.333
99	A	3	3	1.00	14	0.214
100	A	3	3	1.00	24	0.125
101	A	5	3	1.00	22	0.136
102	A	4	4	1.00	22	0.182
103	A	3	3	1.00	22	0.136
104	A	2	2	1.00	20	0.100
105	A	1	1	1.00	19	0.053
106	A	6	4	1.00	22	0.182
107	A	2	2	1.00	22	0.091
108	A	8	6	1.00	22	0.273
109	A	6	4	1.00	27	0.148
110	A	5	3	1.00	27	0.111
111	A	4	4	1.00	27	0.148
112	A	3	3	1.00	27	0.111
113	A	2	2	1.00	25	0.080
114	A	1	1	1.00	24	0.042
115	A	6	4	1.00	27	0.148
116	A	2	2	1.00	27	0.074
117	A	8	6	1.00	27	0.222
118	A	4	4	1.00	27	0.148
119	A	5	6	1.00	27	0.222
120	A	7	6	1.00	27	0.222
121	A	4	6	1.00	27	0.222
122	A	3	3	1.00	27	0.111
123	A	2	2	1.00	25	0.080
124	A	2	2	1.00	24	0.083
125	A	8	6	1.00	27	0.222
126	A	5	6	1.00	27	0.222
127	A	11	8	1.00	27	0.296
128	A	5	6	1.00	27	0.222
129	A	11	6	1.00	27	0.222

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
130	A	5	7	1.00	27	0.259
131	A	7	5	1.00	27	0.185
132	A	4	6	1.00	27	0.222
133	A	4	3	1.00	27	0.111
134	A	3	3	1.00	25	0.120
135	A	4	4	1.00	24	0.167
136	A	11	7	1.00	27	0.259
137	A	5	7	1.00	27	0.259
138	A	15	10	1.00	27	0.370
139	A	5	7	1.00	27	0.259
140	A	6	4	1.00	20	0.200
141	A	1	1	1.00	30	0.033
142	A	1	1	1.00	31	0.032
143	A	6	7	1.00	25	0.280
144	A	5	6	1.00	25	0.240
145	A	4	5	1.00	23	0.217
146	N/A	0	0	1.00	25	0.000
147	N/A	0	0	1.00	25	0.000
148	N/A	0	0	1.00	25	0.000
149	A	9	6	1.00	27	0.222
150	A	6	5	1.00	27	0.185
151	A	3	3	1.00	27	0.111
152	A	1	1	1.00	27	0.037
153	A	3	3	1.00	27	0.111
154	A	5	3	1.00	27	0.111
155	A	1	1	1.00	22	0.045
156	A	11	10	1.00	25	0.400
157	A	14	6	1.00	25	0.240
158	A	9	10	1.00	25	0.400
159	A	7	6	1.00	23	0.261
160	A	6	4	1.00	22	0.182
161	A	10	10	1.00	25	0.400
162	A	12	9	1.00	25	0.360
163	A	10	10	1.00	25	0.400
164	A	16	8	1.00	25	0.320

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
165	A	16	11	1.00	27	0.407
166	A	25	7	1.00	27	0.259
167	A	14	11	1.00	27	0.407
168	A	9	7	1.00	25	0.280
169	A	10	5	1.00	24	0.208
170	A	17	12	1.00	27	0.444
171	A	17	11	1.00	27	0.407
172	A	17	12	1.00	27	0.444
173	A	24	10	1.00	27	0.370
174	A	21	11	1.00	27	0.407
175	A	40	9	1.00	27	0.333
176	A	19	11	1.00	27	0.407
177	A	11	7	1.00	25	0.280
178	A	14	5	1.00	24	0.208
179	A	26	13	1.00	27	0.482
180	A	24	12	1.00	27	0.444
181	A	28	15	1.00	27	0.556
182	A	31	12	1.00	27	0.444
183	A	16	9	1.00	27	0.333
184	A	10	9	1.00	27	0.333
185	A	11	8	1.00	27	0.296
186	A	6	6	1.00	25	0.240
187	A	8	5	1.00	24	0.208
188	A	9	6	1.00	27	0.222
189	A	15	10	1.00	27	0.370
190	A	12	9	1.00	27	0.333
191	A	24	11	1.00	27	0.407
192	A	15	14	1.00	27	0.518
193	A	10	9	1.00	27	0.333
194	A	11	8	1.00	27	0.296
195	A	3	3	1.00	25	0.120
196	A	11	8	1.00	24	0.333
197	A	12	9	1.00	27	0.333
198	A	20	14	1.00	27	0.518
199	A	17	15	1.00	27	0.556

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
200	A	32	15	1.00	27	0.556
201	A	16	13	1.00	27	0.482
202	A	8	6	1.00	27	0.222
203	A	15	10	1.00	27	0.370
204	A	5	5	1.00	25	0.200
205	A	15	9	1.00	24	0.375
206	A	17	11	1.00	27	0.407
207	A	27	15	1.00	27	0.556
208	A	23	19	1.00	27	0.704
209	A	43	17	1.00	27	0.630
210	A	14	8	1.00	29	0.276
211	A	10	6	1.00	29	0.207
212	A	5	4	1.00	27	0.148
213	A	5	5	1.00	26	0.192
214	A	12	8	1.00	29	0.276
215	A	7	7	1.00	29	0.241
216	A	13	10	1.00	29	0.345
217	A	9	9	1.00	29	0.310
218	A	20	14	1.00	29	0.483
219	A	17	11	1.00	29	0.379
220	A	6	6	1.00	27	0.222
221	A	10	8	1.01	26	0.308
222	A	17	12	1.00	29	0.414
223	A	14	13	1.00	29	0.448
224	A	18	15	1.00	29	0.517
225	A	16	11	1.00	29	0.379
226	A	27	18	1.00	29	0.621
227	A	25	14	1.00	29	0.483
228	A	6	6	1.00	27	0.222
229	A	16	8	1.00	26	0.308
230	A	23	16	1.00	29	0.552
231	A	23	15	1.00	29	0.517
232	A	25	20	1.00	29	0.690
233	A	27	15	1.00	29	0.517
234	A	14	7	1.00	29	0.241

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
235	A	10	5	1.00	29	0.172
236	A	9	7	1.00	29	0.241
237	A	5	5	1.03	29	0.172
238	A	4	3	1.00	27	0.111
239	A	1	1	1.00	26	0.038
240	A	8	5	1.00	29	0.172
241	A	6	6	1.00	29	0.207
242	A	13	10	1.00	29	0.345
243	A	9	9	1.00	29	0.310
244	A	22	12	1.00	29	0.414
245	A	14	11	1.00	29	0.379
246	A	13	9	1.00	29	0.310
247	A	7	7	1.00	29	0.241
248	A	7	5	1.00	27	0.185
249	A	6	6	1.00	26	0.231
250	A	15	10	1.00	29	0.345
251	A	14	10	1.00	29	0.345
252	A	26	14	1.00	29	0.483
253	A	24	11	1.00	29	0.379
254	A	26	11	1.00	29	0.379
255	A	16	9	1.00	29	0.310
256	A	16	7	1.00	29	0.241
257	A	9	9	1.00	29	0.310
258	A	9	7	1.00	27	0.259
259	A	9	9	1.00	26	0.346
260	A	24	12	1.00	29	0.414
261	A	19	14	1.00	29	0.483
262	A	38	17	1.00	29	0.586
263	A	32	15	1.00	29	0.517
264	A	10	5	1.00	24	0.208
265	A	8	7	1.00	24	0.292
266	A	5	5	1.00	24	0.208
267	A	3	3	1.00	22	0.136
268	A	1	1	1.00	21	0.048
269	A	8	5	1.00	24	0.208

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
270	A	6	6	1.00	24	0.250
271	A	13	10	1.00	24	0.417
272	A	1	1	1.00	22	0.045
273	A	6	6	1.00	22	0.273
274	A	9	9	1.00	22	0.409
275	A	13	10	1.00	22	0.454
276	A	23	7	1.00	27	0.259
277	A	13	6	1.00	27	0.222
278	A	6	5	1.00	25	0.200
279	N/A	0	0	1.00	27	0.000
280	N/A	0	0	1.00	27	0.000
281	N/A	0	0	1.00	27	0.000
282	N/A	0	0	1.00	29	0.000
283	N/A	0	0	1.00	29	0.000
284	N/A	0	0	1.00	29	0.000
285	N/A	0	0	1.00	29	0.000
286	N/A	0	0	1.00	29	0.000
287	N/A	0	0	1.00	29	0.000
288	N/A	0	0	1.00	24	0.000
289	A	24	13	1.00	20	0.650
290	A	17	11	1.00	20	0.550
291	A	10	7	1.00	18	0.389
292	A	10	6	1.00	20	0.300
293	A	18	10	1.00	20	0.500
294	A	28	11	1.00	20	0.550
295	A	24	9	1.00	22	0.409
296	A	14	8	1.00	22	0.364
297	A	6	5	1.00	22	0.227
298	A	1	1	1.00	22	0.045
299	A	7	7	1.00	22	0.318
300	A	11	10	1.00	22	0.454
301	A	17	11	1.00	22	0.500
302	N/A	0	0	1.00	24	0.000

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
303	A	13	4	1.00	24	0.167
304	A	10	6	1.00	24	0.250
305	A	6	4	1.00	24	0.167
306	A	4	3	1.00	22	0.136
307	A	1	1	1.00	21	0.048
308	A	10	6	1.00	24	0.250
309	A	7	7	1.00	24	0.292
310	A	18	10	1.00	24	0.417
311	A	7	3	1.00	20	0.150
312	A	6	3	1.00	20	0.150
313	A	5	3	1.00	18	0.167
314	N/A	0	0	1.00	20	0.000
315	N/A	0	0	1.00	20	0.000
316	A	12	5	1.00	28	0.179
317	A	12	5	1.00	28	0.179
318	A	6	5	1.00	28	0.179
319	A	9	5	1.00	26	0.192
320	A	6	5	1.00	25	0.200
321	N/A	0	0	1.00	28	0.000
322	N/A	0	0	1.00	28	0.000
323	N/A	0	0	1.00	28	0.000
324	N/A	0	0	1.00	28	0.000
325	A	15	5	1.00	28	0.179
326	A	12	5	1.00	28	0.179
327	A	12	5	1.00	26	0.192
328	A	9	5	1.00	25	0.200
329	N/A	0	0	1.00	28	0.000
330	N/A	0	0	1.00	28	0.000
331	N/A	0	0	1.00	28	0.000
332	N/A	0	0	1.00	28	0.000
333	A	15	5	1.00	28	0.179
334	A	15	5	1.00	28	0.179
335	A	15	5	1.00	26	0.192
336	A	12	5	1.00	25	0.200

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
337	N/A	0	0	1.00	28	0.000
338	N/A	0	0	1.00	28	0.000
339	N/A	0	0	1.00	28	0.000
340	N/A	0	0	1.00	28	0.000
341	A	5	3	1.00	24	0.125
342	A	5	3	1.00	24	0.125
343	A	4	3	1.00	24	0.125
344	A	4	3	1.00	24	0.125
345	A	2	2	1.00	22	0.091
346	A	1	1	1.00	21	0.048
347	N/A	0	0	1.00	24	0.000
348	N/A	0	0	1.00	24	0.000
349	A	12	5	1.00	28	0.179
350	A	9	5	1.00	28	0.179
351	A	9	5	1.00	28	0.179
352	A	6	5	1.00	28	0.179
353	A	4	4	1.00	26	0.154
354	A	1	1	1.00	25	0.040
355	N/A	0	0	1.00	28	0.000
356	N/A	0	0	1.00	28	0.000
357	N/A	0	0	1.00	28	0.000
358	N/A	0	0	1.00	26	0.000
359	N/A	0	0	1.00	25	0.000
360	N/A	0	0	1.00	28	0.000
361	N/A	0	0	1.00	28	0.000
362	N/A	0	0	1.00	28	0.000
363	N/A	0	0	1.00	26	0.000
364	N/A	0	0	1.00	25	0.000
365	N/A	0	0	1.00	28	0.000
366	N/A	0	0	1.00	28	0.000
367	N/A	0	0	1.00	28	0.000
368	N/A	0	0	1.00	28	0.000

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
369	N/A	0	0	1.00	28	0.000
370	N/A	0	0	1.00	28	0.000
371	N/A	0	0	1.00	28	0.000
372	N/A	0	0	1.00	28	0.000
373	N/A	0	0	1.00	24	0.000
374	A	8	4	1.00	20	0.200
375	A	7	4	1.00	20	0.200
376	A	6	4	1.00	18	0.222
377	N/A	0	0	1.00	20	0.000
378	N/A	0	0	1.00	20	0.000
379	A	2	1	1.00	33	0.030
380	N/A	0	0	1.00	28	0.000
381	A	22	6	1.00	28	0.214
382	A	16	7	1.00	28	0.250
383	A	14	7	1.00	26	0.269
384	A	7	7	1.00	25	0.280
385	N/A	0	0	1.00	28	0.000
386	N/A	0	0	1.00	28	0.000
387	N/A	0	0	1.00	28	0.000
388	N/A	0	0	1.00	28	0.000
389	N/A	0	0	1.00	28	0.000
390	A	28	6	1.00	28	0.214
391	A	19	6	1.00	28	0.214
392	A	22	8	1.00	26	0.308
393	A	10	6	1.00	25	0.240
394	N/A	0	0	1.00	28	0.000
395	N/A	0	0	1.00	28	0.000
396	N/A	0	0	1.00	28	0.000
397	N/A	0	0	1.00	28	0.000
398	N/A	0	0	1.00	28	0.000
399	A	34	6	1.00	28	0.214
400	A	28	6	1.00	28	0.214

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
401	A	28	8	1.00	26	0.308
402	A	13	6	1.00	25	0.240
403	N/A	0	0	1.00	28	0.000
404	N/A	0	0	1.00	28	0.000
405	N/A	0	0	1.00	28	0.000
406	N/A	0	0	1.00	28	0.000
407	N/A	0	0	1.00	28	0.000
408	A	13	6	1.00	28	0.214
409	A	10	6	1.00	28	0.214
410	A	10	6	1.00	28	0.214
411	A	7	7	1.00	28	0.250
412	A	5	5	1.00	26	0.192
413	A	1	1	1.00	25	0.040
414	N/A	0	0	1.00	28	0.000
415	N/A	0	0	1.00	28	0.000
416	N/A	0	0	1.00	28	0.000
417	N/A	0	0	1.00	28	0.000
418	N/A	0	0	1.00	28	0.000
419	N/A	0	0	1.00	26	0.000
420	N/A	0	0	1.00	25	0.000
421	N/A	0	0	1.00	28	0.000
422	N/A	0	0	1.00	28	0.000
423	N/A	0	0	1.00	28	0.000
424	N/A	0	0	1.00	28	0.000
425	N/A	0	0	1.00	28	0.000
426	N/A	0	0	1.00	26	0.000
427	N/A	0	0	1.00	25	0.000
428	N/A	0	0	1.00	28	0.000
429	N/A	0	0	1.00	28	0.000
430	A	1	1	1.00	21	0.048
431	A	27	8	1.00	27	0.296
432	A	32	8	1.00	27	0.296

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
433	A	17	10	1.00	25	0.400
434	A	14	8	1.00	24	0.333
435	N/A	0	0	1.00	27	0.000
436	A	32	8	1.00	29	0.276
437	A	42	8	1.00	29	0.276
438	A	32	10	1.00	27	0.370
439	A	19	8	1.00	26	0.308
440	N/A	0	0	1.00	29	0.000
441	A	3	2	1.00	38	0.053
442	A	15	9	1.00	24	0.375
443	A	7	7	1.00	24	0.292
444	A	1	1	1.00	24	0.042
445	N/A	0	0	1.00	24	0.000
446	N/A	0	0	1.00	24	0.000
447	A	17	10	1.00	24	0.417
448	A	8	7	1.00	24	0.292
449	A	1	1	1.00	24	0.042
450	N/A	0	0	1.00	24	0.000
451	A	27	12	1.00	24	0.500
452	A	10	9	1.00	24	0.375
453	A	1	1	1.00	24	0.042
454	N/A	0	0	1.00	24	0.000
455	A	15	9	1.00	24	0.375
456	A	7	7	1.00	24	0.292
457	A	1	1	1.00	24	0.042
458	N/A	0	0	1.00	24	0.000
459	N/A	0	0	1.00	24	0.000
460	A	17	10	1.00	24	0.417
461	A	8	7	1.00	24	0.292
462	A	1	1	1.00	24	0.042
463	N/A	0	0	1.00	24	0.000
464	A	3	3	1.00	19	0.158
465	A	9	4	1.00	24	0.167
466	A	7	4	1.00	24	0.167

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
467	A	5	4	1.00	24	0.167
468	A	1	1	1.00	24	0.042
469	N/A	0	0	1.00	24	0.000
470	N/A	0	0	1.00	24	0.000
471	A	10	5	1.00	24	0.208
472	A	8	5	1.00	24	0.208
473	A	6	6	1.00	24	0.250
474	A	1	1	1.00	24	0.042
475	N/A	0	0	1.00	24	0.000
476	N/A	0	0	1.00	24	0.000
477	A	12	8	1.00	24	0.333
478	A	4	4	1.00	24	0.167
479	A	1	1	1.00	24	0.042
480	N/A	0	0	1.00	24	0.000
481	N/A	0	0	1.00	24	0.000
482	A	6	4	1.00	29	0.138
483	A	9	4	1.00	27	0.148
484	A	6	4	1.00	26	0.154
485	N/A	0	0	1.00	29	0.000
486	N/A	0	0	1.00	29	0.000
487	A	12	4	1.00	29	0.138
488	A	12	4	1.00	27	0.148
489	A	9	4	1.00	26	0.154
490	N/A	0	0	1.00	29	0.000
491	N/A	0	0	1.00	29	0.000
492	A	15	4	1.00	29	0.138
493	A	15	4	1.00	27	0.148
494	A	12	4	1.00	26	0.154
495	N/A	0	0	1.00	29	0.000
496	N/A	0	0	1.00	29	0.000
497	N/A	0	0	1.00	24	0.000
498	A	9	4	1.00	24	0.167
499	A	6	4	1.00	24	0.167

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
500	A	4	3	1.00	22	0.136
501	A	1	1	1.00	21	0.048
502	N/A	0	0	1.00	24	0.000
503	N/A	0	0	1.00	24	0.000
504	A	13	8	1.00	30	0.267
505	A	8	6	1.00	30	0.200
506	A	4	4	1.00	30	0.133
507	A	6	5	1.00	30	0.167
508	A	8	8	1.00	30	0.267
509	A	6	6	1.00	30	0.200
510	A	12	9	1.00	30	0.300
511	A	7	6	1.00	30	0.200
512	A	8	6	1.00	30	0.200
513	A	9	7	1.00	30	0.233
514	A	10	10	1.00	30	0.333
515	A	9	9	1.00	30	0.300
516	A	9	7	1.00	30	0.233
517	A	12	9	1.00	30	0.300
518	A	13	8	1.00	30	0.267
519	A	13	7	1.00	30	0.233
520	A	7	9	1.00	30	0.300
521	A	10	8	1.00	30	0.267
522	A	13	7	1.00	30	0.233
523	A	9	7	1.00	30	0.233
524	A	6	5	1.00	30	0.167
525	A	2	2	1.00	30	0.067
526	A	5	6	1.00	30	0.200
527	A	8	8	1.00	30	0.267
528	A	7	9	1.00	30	0.300
529	A	10	10	1.00	30	0.333
530	A	8	8	1.00	30	0.267
531	A	5	6	1.00	30	0.200
532	A	3	3	1.00	30	0.100
533	A	8	8	1.00	30	0.267
534	A	10	8	1.00	30	0.267

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
535	A	9	9	1.00	30	0.300
536	A	6	6	1.00	30	0.200
537	A	8	8	1.00	30	0.267
538	A	8	8	1.00	30	0.267
539	A	5	5	1.00	30	0.167
540	A	23	13	1.00	32	0.406
541	A	13	11	1.00	32	0.344
542	A	6	6	1.00	32	0.188
543	A	8	6	1.00	32	0.188
544	A	19	13	1.00	32	0.406
545	A	20	12	1.00	32	0.375
546	A	19	15	1.00	32	0.469
547	A	11	9	1.00	32	0.281
548	A	13	11	1.00	32	0.344
549	A	11	9	1.00	32	0.281
550	A	23	15	1.00	32	0.469
551	A	21	13	1.00	32	0.406
552	A	17	9	1.00	32	0.281
553	A	19	15	1.00	32	0.469
554	A	23	13	1.00	32	0.406
555	A	17	10	1.00	32	0.312
556	A	28	19	1.00	32	0.594
557	A	25	16	1.00	32	0.500
558	A	17	10	1.00	32	0.312
559	A	11	9	1.00	32	0.281
560	A	8	6	1.00	32	0.188
561	A	2	2	1.00	32	0.062
562	A	16	11	1.00	32	0.344
563	A	30	18	1.00	32	0.562
564	A	28	19	1.00	32	0.594
565	A	23	15	1.00	32	0.469
566	A	19	13	1.00	32	0.406
567	A	16	11	1.00	32	0.344
568	A	7	7	1.00	32	0.219
569	A	21	14	1.00	32	0.438

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
570	A	25	16	1.00	32	0.500
571	A	21	13	1.00	32	0.406
572	A	20	12	1.00	32	0.375
573	A	30	18	1.00	32	0.562
574	A	21	14	1.00	32	0.438
575	A	10	10	1.00	32	0.312
576	A	11	7	1.00	35	0.200
577	A	6	5	1.00	33	0.152
578	A	6	6	1.00	32	0.188
579	A	13	9	1.00	35	0.257
580	A	8	8	1.00	35	0.229
581	A	18	12	1.00	35	0.343
582	A	7	7	1.00	33	0.212
583	A	11	9	1.00	32	0.281
584	A	18	13	1.00	35	0.371
585	A	15	14	1.00	35	0.400
586	A	6	6	1.00	35	0.171
587	A	5	4	1.00	33	0.121
588	A	2	2	1.00	32	0.062
589	A	9	6	1.00	35	0.171
590	A	7	7	1.00	35	0.200
591	A	8	8	1.00	35	0.229
592	A	8	6	1.00	33	0.182
593	A	7	7	1.00	32	0.219
594	A	16	11	1.00	35	0.314
595	A	15	11	1.00	35	0.314
596	A	5	5	1.00	19	0.263
597	A	6	6	1.00	19	0.316
598	A	5	5	1.00	19	0.263
599	A	4	4	1.00	17	0.235
600	A	4	3	1.00	16	0.188
601	A	12	12	1.00	19	0.632
602	A	5	6	1.00	19	0.316
603	A	10	10	1.00	19	0.526
604	A	6	7	1.00	19	0.368

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
605	A	6	6	1.00	21	0.286
606	A	7	8	1.00	21	0.381
607	A	5	5	1.00	21	0.238
608	A	5	5	1.00	19	0.263
609	A	5	5	1.00	18	0.278
610	A	14	12	1.00	21	0.571
611	A	6	6	1.00	21	0.286
612	A	13	14	1.00	21	0.667
613	A	6	7	1.00	21	0.333
614	A	5	5	1.00	21	0.238
615	A	8	7	1.00	21	0.333
616	A	5	5	1.00	21	0.238
617	A	6	5	1.00	19	0.263
618	A	5	5	1.00	18	0.278
619	A	19	13	1.00	21	0.619
620	A	6	6	1.00	21	0.286
621	A	15	16	1.00	21	0.762
622	A	8	8	1.00	21	0.381
623	A	5	5	1.00	18	0.278
624	A	27	12	1.00	21	0.571
625	A	23	9	1.00	21	0.429
626	A	23	9	1.00	21	0.429
627	A	18	6	1.00	19	0.316
628	A	18	6	1.00	18	0.333
629	A	25	8	1.00	21	0.381
630	A	24	11	1.00	21	0.524
631	A	27	10	1.00	21	0.476
632	A	29	12	1.00	21	0.571
633	A	23	9	1.00	21	0.429
634	A	3	3	0.97	19	0.158
635	A	28	11	1.00	21	0.524
636	A	30	13	1.00	21	0.619
637	A	49	12	1.00	21	0.571
638	A	46	10	1.00	21	0.476
639	A	26	9	1.00	18	0.500

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
640	A	50	14	1.00	21	0.667
641	A	27	10	1.00	21	0.476
642	A	7	8	1.00	21	0.381
643	A	4	4	1.00	19	0.210
644	A	32	12	1.00	21	0.571
645	A	34	14	1.00	21	0.667
646	A	80	11	1.00	21	0.524
647	A	62	11	1.00	21	0.524
648	A	34	10	1.00	18	0.556
649	N/A	0	0	1.00	20	0.000
650	N/A	0	0	1.00	20	0.000
651	A	6	7	1.00	20	0.350
652	A	7	9	1.00	20	0.450
653	A	8	10	1.00	20	0.500
654	A	6	7	0.94	23	0.304
655	A	5	6	0.93	23	0.261
656	A	4	5	0.92	21	0.238
657	N/A	0	0	1.00	23	0.000
658	N/A	0	0	1.00	23	0.000
659	A	26	7	1.00	20	0.350
660	A	17	7	1.00	20	0.350
661	A	10	7	1.00	18	0.389
662	A	3	3	1.00	10	0.300
663	A	22	7	1.00	20	0.350
664	N/A	0	0	1.00	22	0.000
665	N/A	0	0	1.00	22	0.000
666	N/A	0	0	1.00	22	0.000
667	N/A	0	0	1.00	22	0.000
668	A	27	7	1.00	20	0.350
669	A	15	7	1.00	18	0.389
670	A	4	4	1.00	10	0.400
671	N/A	0	0	1.00	20	0.000
672	N/A	0	0	1.00	20	0.000

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
673	N/A	0	0	1.00	22	0.000
674	N/A	0	0	1.00	22	0.000
675	N/A	0	0	1.00	22	0.000
676	N/A	0	0	1.00	22	0.000
677	A	26	7	1.00	20	0.350
678	A	15	7	1.00	18	0.389
679	A	5	5	1.00	10	0.500
680	N/A	0	0	1.00	20	0.000
681	N/A	0	0	1.00	20	0.000
682	N/A	0	0	1.00	22	0.000
683	N/A	0	0	1.00	22	0.000
684	N/A	0	0	1.00	22	0.000
685	N/A	0	0	1.00	22	0.000
686	A	42	10	1.00	22	0.454
687	A	23	10	1.00	20	0.500
688	A	7	7	1.00	12	0.583
689	N/A	0	0	1.00	22	0.000
690	N/A	0	0	1.00	22	0.000
691	A	32	13	1.00	20	0.650
692	A	8	8	1.00	12	0.667
693	N/A	0	0	1.00	22	0.000
694	N/A	0	0	1.00	22	0.000
695	A	39	9	1.00	22	0.409
696	A	21	9	1.00	20	0.450
697	A	6	6	1.00	12	0.500
698	N/A	0	0	1.00	22	0.000
699	N/A	0	0	1.00	22	0.000
700	A	21	9	1.00	20	0.450
701	A	7	7	1.00	12	0.583
702	N/A	0	0	1.00	22	0.000
703	N/A	0	0	1.00	22	0.000

CHAPTER 3

LISTING OF INTEGRALS

3.1 $\int x^4(d-c^2dx^2)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 128

$$\int x^4(d-c^2dx^2)(a+b\arcsin(cx))\,dx = \frac{2bd\sqrt{1-c^2x^2}}{35c^5}+\frac{bd(1-c^2x^2)^{3/2}}{105c^5}-\frac{8bd(1-c^2x^2)^{5/2}}{175c^5}+\frac{bd(1-c^2x^2)^{7/2}}{49c^5}+\frac{1}{5}dx^5(a+b\arcsin(cx))-\frac{1}{7}c^2dx^7(a+b\arcsin(cx))$$

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

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {14, 4777, 12, 457, 78}

$$\int x^4(d-c^2dx^2)(a+b\arcsin(cx))\,dx = -\frac{1}{7}c^2dx^7(a+b\arcsin(cx))+\frac{1}{5}dx^5(a+b\arcsin(cx))+\frac{bd(1-c^2x^2)^{7/2}}{49c^5}-\frac{8bd(1-c^2x^2)^{5/2}}{175c^5}+\frac{bd(1-c^2x^2)^{3/2}}{105c^5}+\frac{2bd\sqrt{1-c^2x^2}}{35c^5}$$

```
[In] Int[x^4*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

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

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule steps

$$\text{integral} = \frac{1}{5}dx^5(a+b\arcsin(cx)) - \frac{1}{7}c^2dx^7(a+b\arcsin(cx)) - (bc)\int \frac{dx^5(7-5c^2x^2)}{35\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{1}{5}dx^5(a+b\arcsin(cx)) - \frac{1}{7}c^2dx^7(a+b\arcsin(cx)) - \frac{1}{35}(bcd)\int \frac{x^5(7-5c^2x^2)}{\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{1}{5}dx^5(a+b\arcsin(cx)) - \frac{1}{7}c^2dx^7(a+b\arcsin(cx)) - \frac{1}{70}(bcd)\text{Subst}\left(\int \frac{x^2(7-5c^2x)}{\sqrt{1-c^2x}}\,dx, x, x^2\right)$$

$$= \frac{1}{5}dx^5(a+b\arcsin(cx)) - \frac{1}{7}c^2dx^7(a+b\arcsin(cx)) - \frac{1}{70}(bcd)\text{Subst}\left(\int \left(\frac{2}{c^4\sqrt{1-c^2x}} + \frac{\sqrt{1-c^2x}}{c^4} - \frac{8(1-c^2x)^{3/2}}{c^4} + \frac{5(1-c^2x)^{5/2}}{c^4}\right) dx, x, x^2\right)$$

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

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.68

$$\int x^4\left(d-c^2dx^2\right)(a+b\arcsin(cx))\,dx = \frac{d\left(-105ax^5(-7+5c^2x^2) + \frac{b\sqrt{1-c^2x^2}(152+76c^2x^2+57c^4x^4-75c^6x^6)}{c^5} - 105bx^5(-7+5c^2x^2)\arcsin(cx)\right)}{3675}$$

```
[In] Integrate[x^4*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
[Out] (d*(-105*a*x^5*(-7 + 5*c^2*x^2) + (b*Sqrt[1 - c^2*x^2]*(152 + 76*c^2*x^2 +
57*c^4*x^4 - 75*c^6*x^6))/c^5 - 105*b*x^5*(-7 + 5*c^2*x^2)*ArcSin[c*x]))/36
75
```

Maple [A] (verified)

Time = 0.06 (sec) , antiderivative size = 126, normalized size of antiderivative = 0.98

method	result
parts	$-da\left(\frac{1}{7}c^2x^7-\frac{1}{5}x^5\right)-\frac{db\left(\frac{\arcsin(cx)c^7x^7}{7}-\frac{\arcsin(cx)c^5x^5}{5}+\frac{c^6x^6\sqrt{-c^2x^2+1}}{49}-\frac{19c^4x^4\sqrt{-c^2x^2+1}}{1225}-\frac{76c^2x^2\sqrt{-c^2x^2+1}}{3675}\right.}{c^5}$
derivativedivides	$\frac{-da\left(\frac{1}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-db\left(\frac{\arcsin(cx)c^7x^7}{7}-\frac{\arcsin(cx)c^5x^5}{5}+\frac{c^6x^6\sqrt{-c^2x^2+1}}{49}-\frac{19c^4x^4\sqrt{-c^2x^2+1}}{1225}-\frac{76c^2x^2\sqrt{-c^2x^2+1}}{3675}-152\right.}{c^5}$
default	$\frac{-da\left(\frac{1}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-db\left(\frac{\arcsin(cx)c^7x^7}{7}-\frac{\arcsin(cx)c^5x^5}{5}+\frac{c^6x^6\sqrt{-c^2x^2+1}}{49}-\frac{19c^4x^4\sqrt{-c^2x^2+1}}{1225}-\frac{76c^2x^2\sqrt{-c^2x^2+1}}{3675}-152\right.}{c^5}$

```
[In] int(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -d*a*(1/7*c^2*x^7-1/5*x^5)-d*b/c^5*(1/7*arcsin(c*x)*c^7*x^7-1/5*arcsin(c*x)
*c^5*x^5+1/49*c^6*x^6*(-c^2*x^2+1)^(1/2)-19/1225*c^4*x^4*(-c^2*x^2+1)^(1/2)
-76/3675*c^2*x^2*(-c^2*x^2+1)^(1/2)-152/3675*(-c^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 101, normalized size of antiderivative = 0.79

$$\int x^4(d-c^2dx^2)(a+b\arcsin(cx))\,dx =$$
$$-\frac{525\,ac^7dx^7-735\,ac^5dx^5+105\,(5\,bc^7dx^7-7\,bc^5dx^5)\arcsin(cx)+(75\,bc^6dx^6-57\,bc^4dx^4-76\,bc^2dx^2-1}{3675\,c^5}$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/3675*(525*a*c^7*d*x^7 - 735*a*c^5*d*x^5 + 105*(5*b*c^7*d*x^7 - 7*b*c^5*d
*x^5)*arcsin(c*x) + (75*b*c^6*d*x^6 - 57*b*c^4*d*x^4 - 76*b*c^2*d*x^2 - 152
*b*d)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] (verification not implemented)

Time = 0.62 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.18

$$\int x^4(d-c^2dx^2)(a+b\arcsin(cx))\,dx$$
$$=\begin{cases}-\frac{ac^2dx^7}{7}+\frac{adx^5}{5}-\frac{bc^2dx^7\operatorname{asin}(cx)}{7}-\frac{bcdx^6\sqrt{-c^2x^2+1}}{49}+\frac{bdx^5\operatorname{asin}(cx)}{5}+\frac{19bdx^4\sqrt{-c^2x^2+1}}{1225c}+\frac{76bdx^2\sqrt{-c^2x^2+1}}{3675c^3}+\frac{152bd\sqrt{-c^2x}}{3675c^5} \\ \frac{adx^5}{5}\end{cases}$$

```
[In] integrate(x**4*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**7/7 + a*d*x**5/5 - b*c**2*d*x**7*asin(c*x)/7 - b*c*
d*x**6*sqrt(-c**2*x**2 + 1)/49 + b*d*x**5*asin(c*x)/5 + 19*b*d*x**4*sqrt(-c
**2*x**2 + 1)/(1225*c) + 76*b*d*x**2*sqrt(-c**2*x**2 + 1)/(3675*c**3) + 152
*b*d*sqrt(-c**2*x**2 + 1)/(3675*c**5), Ne(c, 0)), (a*d*x**5/5, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 189, normalized size of antiderivative = 1.48

$$\int x^4\left(d-c^2dx^2\right)(a+b\arcsin(cx))\,dx=-\frac{1}{7}\,ac^2dx^7+\frac{1}{5}\,adx^5-\frac{1}{245}\left(35\,x^7\arcsin\left(cx\right)+\left(\frac{5\,\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\,\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\,\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\,\sqrt{-c^2x^2+1}}{c^8}\right)+\frac{1}{75}\left(15\,x^5\arcsin\left(cx\right)+\left(\frac{3\,\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\,\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\,\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/7*a*c^2*d*x^7 + 1/5*a*d*x^5 - 1/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x
^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c
^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^2*d + 1/75*(15*x^5*arcsin(c*x) + (3*
sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2
 + 1)/c^6)*c)*b*d
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 195, normalized size of antiderivative = 1.52

$$\int x^4\left(d-c^2dx^2\right)(a+b\arcsin(cx))\,dx=-\frac{1}{7}\,ac^2dx^7+\frac{1}{5}\,adx^5-\frac{\left(c^2x^2-1\right)^3bdx\arcsin\left(cx\right)}{7\,c^4}-\frac{8\,\left(c^2x^2-1\right)^2bdx\arcsin\left(cx\right)}{35\,c^4}-\frac{\left(c^2x^2-1\right)bdx\arcsin\left(cx\right)}{35\,c^4}-\frac{\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}bd}{49\,c^5}+\frac{2\,bdx\arcsin\left(cx\right)}{35\,c^4}-\frac{8\,\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}bd}{175\,c^5}+\frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}bd}{105\,c^5}+\frac{2\,\sqrt{-c^2x^2+1}bd}{35\,c^5}$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/7*a*c^2*d*x^7 + 1/5*a*d*x^5 - 1/7*(c^2*x^2 - 1)^3*b*d*x*arcsin(c*x)/c^4
- 8/35*(c^2*x^2 - 1)^2*b*d*x*arcsin(c*x)/c^4 - 1/35*(c^2*x^2 - 1)*b*d*x*arc
sin(c*x)/c^4 - 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d/c^5 + 2/35*b*d*x
*arcsin(c*x)/c^4 - 8/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d/c^5 + 1/105
*(-c^2*x^2 + 1)^(3/2)*b*d/c^5 + 2/35*sqrt(-c^2*x^2 + 1)*b*d/c^5
```

Mupad [F(-1)]

Timed out.

$$\int x^4(d-c^2dx^2)(a+b\arcsin(cx))\,dx=\int x^4\left(a+b\,\mathrm{asin}(c\,x)\right)\left(d-c^2\,d\,x^2\right)\,dx$$

```
[In] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2),x)
[Out] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2), x)
```

3.2 $\int x^3(d-c^2dx^2)\,(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 123

$$\int x^3(d-c^2dx^2)\,(a+b\arcsin(cx))\,dx=\frac{bdx\sqrt{1-c^2x^2}}{24c^3}+\frac{bdx^3\sqrt{1-c^2x^2}}{36c}-\frac{1}{36}bcdx^5\sqrt{1-c^2x^2}-\frac{bd\arcsin(cx)}{24c^4}+\frac{1}{4}dx^4(a+b\arcsin(cx))-\frac{1}{6}c^2dx^6(a+b\arcsin(cx))$$

```
[Out] -1/24*b*d*arcsin(c*x)/c^4+1/4*d*x^4*(a+b*arcsin(c*x))-1/6*c^2*d*x^6*(a+b*ar
csin(c*x))+1/24*b*d*x*(-c^2*x^2+1)^(1/2)/c^3+1/36*b*d*x^3*(-c^2*x^2+1)^(1/2
)/c-1/36*b*c*d*x^5*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {14, 4777, 12, 470, 327, 222}

$$\int x^3(d-c^2dx^2)\,(a+b\arcsin(cx))\,dx=-\frac{1}{6}c^2dx^6(a+b\arcsin(cx))+\frac{1}{4}dx^4(a+b\arcsin(cx))-\frac{bd\arcsin(cx)}{24c^4}-\frac{1}{36}bcdx^5\sqrt{1-c^2x^2}+\frac{bdx^3\sqrt{1-c^2x^2}}{36c}+\frac{bdx\sqrt{1-c^2x^2}}{24c^3}$$

```
[In] Int[x^3*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d*x*Sqrt[1 - c^2*x^2])/(24*c^3) + (b*d*x^3*Sqrt[1 - c^2*x^2])/(36*c) - (
b*c*d*x^5*Sqrt[1 - c^2*x^2])/36 - (b*d*ArcSin[c*x])/(24*c^4) + (d*x^4*(a +
b*ArcSin[c*x]))/4 - (c^2*d*x^6*(a + b*ArcSin[c*x]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{4}dx^4(a+b\arcsin(cx)) - \frac{1}{6}c^2dx^6(a+b\arcsin(cx)) - (bc)\int \frac{dx^4(3-2c^2x^2)}{12\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{1}{4}dx^4(a+b\arcsin(cx)) - \frac{1}{6}c^2dx^6(a+b\arcsin(cx)) - \frac{1}{12}(bcd)\int \frac{x^4(3-2c^2x^2)}{\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{1}{36}bcdx^5\sqrt{1-c^2x^2} + \frac{1}{4}dx^4(a+b\arcsin(cx))$$
$$-\frac{1}{6}c^2dx^6(a+b\arcsin(cx)) - \frac{1}{9}(bcd)\int \frac{x^4}{\sqrt{1-c^2x^2}}dx$$
$$= \frac{bdx^3\sqrt{1-c^2x^2}}{36c} - \frac{1}{36}bcdx^5\sqrt{1-c^2x^2} + \frac{1}{4}dx^4(a+b\arcsin(cx))$$
$$-\frac{1}{6}c^2dx^6(a+b\arcsin(cx)) - \frac{(bd)\int \frac{x^2}{\sqrt{1-c^2x^2}}dx}{12c}$$
$$= \frac{bdx\sqrt{1-c^2x^2}}{24c^3} + \frac{bdx^3\sqrt{1-c^2x^2}}{36c} - \frac{1}{36}bcdx^5\sqrt{1-c^2x^2}$$
$$+\frac{1}{4}dx^4(a+b\arcsin(cx)) - \frac{1}{6}c^2dx^6(a+b\arcsin(cx)) - \frac{(bd)\int \frac{1}{\sqrt{1-c^2x^2}}dx}{24c^3}$$
$$= \frac{bdx\sqrt{1-c^2x^2}}{24c^3} + \frac{bdx^3\sqrt{1-c^2x^2}}{36c} - \frac{1}{36}bcdx^5\sqrt{1-c^2x^2}$$
$$-\frac{bd\arcsin(cx)}{24c^4} + \frac{1}{4}dx^4(a+b\arcsin(cx)) - \frac{1}{6}c^2dx^6(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.72

$$\int x^3(d-c^2dx^2)(a+b\arcsin(cx))\,dx$$
$$= \frac{d\left(-6ac^4x^4(-3+2c^2x^2) + bcx\sqrt{1-c^2x^2}(3+2c^2x^2-2c^4x^4) - 3b(1-6c^4x^4+4c^6x^6)\arcsin(cx)\right)}{72c^4}$$

```
[In] Integrate[x^3*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
[Out] (d*(-6*a*c^4*x^4*(-3 + 2*c^2*x^2) + b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2
- 2*c^4*x^4) - 3*b*(1 - 6*c^4*x^4 + 4*c^6*x^6)*ArcSin[c*x]))/(72*c^4)
```

Maple [A] (verified)

Time = 0.04 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.93

method	result
parts	$-da\left(\frac{1}{6}c^2x^6-\frac{1}{4}x^4\right) - \frac{db\left(\frac{\arcsin(cx)c^6x^6}{6} - \frac{c^4x^4\arcsin(cx)}{4} + \frac{c^5x^5\sqrt{-c^2x^2+1}}{36} - \frac{c^3x^3\sqrt{-c^2x^2+1}}{36} - \frac{cx\sqrt{-c^2x^2+1}}{24} + \right.}{c^4}$
derivativedivides	$\frac{-da\left(\frac{1}{6}c^6x^6-\frac{1}{4}c^4x^4\right)-db\left(\frac{\arcsin(cx)c^6x^6}{6}-\frac{c^4x^4\arcsin(cx)}{4}+\frac{c^5x^5\sqrt{-c^2x^2+1}}{36}-\frac{c^3x^3\sqrt{-c^2x^2+1}}{36}-\frac{cx\sqrt{-c^2x^2+1}}{24}+\frac{\arcsin(cx)}{24}\right)}{c^4}$
default	$\frac{-da\left(\frac{1}{6}c^6x^6-\frac{1}{4}c^4x^4\right)-db\left(\frac{\arcsin(cx)c^6x^6}{6}-\frac{c^4x^4\arcsin(cx)}{4}+\frac{c^5x^5\sqrt{-c^2x^2+1}}{36}-\frac{c^3x^3\sqrt{-c^2x^2+1}}{36}-\frac{cx\sqrt{-c^2x^2+1}}{24}+\frac{\arcsin(cx)}{24}\right)}{c^4}$

```
[In] int(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -d*a*(1/6*c^2*x^6-1/4*x^4)-d*b/c^4*(1/6*arcsin(c*x)*c^6*x^6-1/4*c^4*x^4*arc
sin(c*x)+1/36*c^5*x^5*(-c^2*x^2+1)^(1/2)-1/36*c^3*x^3*(-c^2*x^2+1)^(1/2)-1/
24*c*x*(-c^2*x^2+1)^(1/2)+1/24*arcsin(c*x))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.78

$$\int x^3(d-c^2dx^2)\,(a+b\arcsin(cx))\,dx = -\frac{12\,ac^6dx^6-18\,ac^4dx^4+3\,(4\,bc^6dx^6-6\,bc^4dx^4+bd)\arcsin{(cx)}+(2\,bc^5dx^5-2\,bc^3dx^3-3\,bcdx)\sqrt{-c^2x^2}}{72\,c^4}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/72*(12*a*c^6*d*x^6 - 18*a*c^4*d*x^4 + 3*(4*b*c^6*d*x^6 - 6*b*c^4*d*x^4 +
 b*d)*arcsin(c*x) + (2*b*c^5*d*x^5 - 2*b*c^3*d*x^3 - 3*b*c*d*x)*sqrt(-c^2*x
^2 + 1))/c^4
```

Sympy [A] (verification not implemented)

Time = 0.49 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.12

$$\int x^3(d-c^2dx^2)\,(a+b\arcsin(cx))\,dx = \begin{cases} -\frac{ac^2dx^6}{6}+\frac{adx^4}{4}-\frac{bc^2dx^6\operatorname{asin}{(cx)}}{6}-\frac{bcdx^5\sqrt{-c^2x^2+1}}{36}+\frac{bdx^4\operatorname{asin}{(cx)}}{4}+\frac{bdx^3\sqrt{-c^2x^2+1}}{36c}+\frac{bdx\sqrt{-c^2x^2+1}}{24c^3}-\frac{bd\operatorname{asin}{(cx)}}{24c^4} & \text{for} \\ \frac{adx^4}{4} & \text{otl} \end{cases}$$

```
[In] integrate(x**3*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**6/6 + a*d*x**4/4 - b*c**2*d*x**6*asin(c*x)/6 - b*c*
d*x**5*sqrt(-c**2*x**2 + 1)/36 + b*d*x**4*asin(c*x)/4 + b*d*x**3*sqrt(-c**2
*x**2 + 1)/(36*c) + b*d*x*sqrt(-c**2*x**2 + 1)/(24*c**3) - b*d*asin(c*x)/(2
4*c**4), Ne(c, 0)), (a*d*x**4/4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.37

$$\int x^3(d-c^2dx^2)(a+b\arcsin(cx))\,dx = -\frac{1}{6}ac^2dx^6 + \frac{1}{4}adx^4 - \frac{1}{288}\left(48x^6\arcsin(cx) + \left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2} + \frac{10\sqrt{-c^2x^2+1}x^3}{c^4} + \frac{15\sqrt{-c^2x^2+1}x}{c^6} - \frac{15\arcsin(cx)}{c^7}\right) + \frac{1}{32}\left(8x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bd$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/6*a*c^2*d*x^6 + 1/4*a*d*x^4 - 1/288*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x
^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c
^6 - 15*arcsin(c*x)/c^7)*c)*b*c^2*d + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^
2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.17

$$\int x^3(d-c^2dx^2)(a+b\arcsin(cx))\,dx = -\frac{1}{6}ac^2dx^6 + \frac{1}{4}adx^4 - \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}bdx}{36c^3} - \frac{(c^2x^2-1)^3bd\arcsin(cx)}{6c^4} + \frac{(-c^2x^2+1)^{\frac{3}{2}}bdx}{36c^3} - \frac{(c^2x^2-1)^2bd\arcsin(cx)}{4c^4} + \frac{\sqrt{-c^2x^2+1}bdx}{24c^3} + \frac{bd\arcsin(cx)}{24c^4}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/6*a*c^2*d*x^6 + 1/4*a*d*x^4 - 1/36*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*
d*x/c^3 - 1/6*(c^2*x^2 - 1)^3*b*d*arcsin(c*x)/c^4 + 1/36*(-c^2*x^2 + 1)^(3/
2)*b*d*x/c^3 - 1/4*(c^2*x^2 - 1)^2*b*d*arcsin(c*x)/c^4 + 1/24*sqrt(-c^2*x^2
 + 1)*b*d*x/c^3 + 1/24*b*d*arcsin(c*x)/c^4
```

Mupad [F(-1)]

Timed out.

$$\int x^3(d-c^2dx^2)\,(a+b\arcsin(cx))\,dx=\int x^3\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)\,dx$$

```
[In] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2),x)
[Out] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2), x)
```

3.3 $\int x^2(d - c^2dx^2)(a + b\arcsin(cx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 105

$$\int x^2(d - c^2dx^2)(a + b\arcsin(cx))\,dx = \frac{2bd\sqrt{1-c^2x^2}}{15c^3} + \frac{bd(1-c^2x^2)^{3/2}}{45c^3} - \frac{bd(1-c^2x^2)^{5/2}}{25c^3} + \frac{1}{3}dx^3(a+b\arcsin(cx)) - \frac{1}{5}c^2dx^5(a+b\arcsin(cx))$$

```
[Out] 1/45*b*d*(-c^2*x^2+1)^(3/2)/c^3-1/25*b*d*(-c^2*x^2+1)^(5/2)/c^3+1/3*d*x^3*(
a+b*arcsin(c*x))-1/5*c^2*d*x^5*(a+b*arcsin(c*x))+2/15*b*d*(-c^2*x^2+1)^(1/2
)/c^3
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {14, 4777, 12, 457, 78}

$$\int x^2(d - c^2dx^2)(a + b\arcsin(cx))\,dx = -\frac{1}{5}c^2dx^5(a+b\arcsin(cx)) + \frac{1}{3}dx^3(a+b\arcsin(cx)) - \frac{bd(1-c^2x^2)^{5/2}}{25c^3} + \frac{bd(1-c^2x^2)^{3/2}}{45c^3} + \frac{2bd\sqrt{1-c^2x^2}}{15c^3}$$

```
[In] Int[x^2*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d*Sqrt[1 - c^2*x^2])/(15*c^3) + (b*d*(1 - c^2*x^2)^(3/2))/(45*c^3) - (
b*d*(1 - c^2*x^2)^(5/2))/(25*c^3) + (d*x^3*(a + b*ArcSin[c*x]))/3 - (c^2*d*
x^5*(a + b*ArcSin[c*x]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{3}dx^3(a+b\arcsin(cx)) - \frac{1}{5}c^2dx^5(a+b\arcsin(cx)) - (bc)\int \frac{dx^3(5-3c^2x^2)}{15\sqrt{1-c^2x^2}}\,dx \\
&= \frac{1}{3}dx^3(a+b\arcsin(cx)) - \frac{1}{5}c^2dx^5(a+b\arcsin(cx)) - \frac{1}{15}(bcd)\int \frac{x^3(5-3c^2x^2)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{1}{3}dx^3(a+b\arcsin(cx)) - \frac{1}{5}c^2dx^5(a+b\arcsin(cx)) - \frac{1}{30}(bcd)\text{Subst}\left(\int \frac{x(5-3c^2x)}{\sqrt{1-c^2x}}\,dx, x, x^2\right) \\
&= \frac{1}{3}dx^3(a+b\arcsin(cx)) - \frac{1}{5}c^2dx^5(a+b\arcsin(cx)) \\
&\quad - \frac{1}{30}(bcd)\text{Subst}\left(\int \left(\frac{2}{c^2\sqrt{1-c^2x}} + \frac{\sqrt{1-c^2x}}{c^2} - \frac{3(1-c^2x)^{3/2}}{c^2}\right)\,dx, x, x^2\right)
\end{aligned}$$

$$= \frac{2bd\sqrt{1-c^2x^2}}{15c^3} + \frac{bd(1-c^2x^2)^{3/2}}{45c^3} - \frac{bd(1-c^2x^2)^{5/2}}{25c^3} + \frac{1}{3}dx^3(a+b\arcsin(cx)) - \frac{1}{5}c^2dx^5(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.81

$$\int x^2(d-c^2dx^2)(a+b\arcsin(cx))\,dx = \frac{d\left(b\sqrt{1-c^2x^2}(26+13c^2x^2-9c^4x^4)+a(75c^3x^3-45c^5x^5)+15bc^3x^3(5-3c^2x^2)\arcsin(cx)\right)}{225c^3}$$

```
[In] Integrate[x^2*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
[Out] (d*(b*Sqrt[1 - c^2*x^2]*(26 + 13*c^2*x^2 - 9*c^4*x^4) + a*(75*c^3*x^3 - 45*
c^5*x^5) + 15*b*c^3*x^3*(5 - 3*c^2*x^2)*ArcSin[c*x]))/(225*c^3)
```

Maple [A] (verified)

Time = 0.04 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.01

method	result
parts	$-da\left(\frac{1}{5}c^2x^5-\frac{1}{3}x^3\right)-\frac{db\left(\frac{\arcsin(cx)c^5x^5}{5}-\frac{c^3x^3\arcsin(cx)}{3}+\frac{c^4x^4\sqrt{-c^2x^2+1}}{25}-\frac{13c^2x^2\sqrt{-c^2x^2+1}}{225}-\frac{26\sqrt{-c^2x^2+1}}{225}\right)}{c^3}$
derivativedivides	$\frac{-da\left(\frac{1}{5}c^5x^5-\frac{1}{3}c^3x^3\right)-db\left(\frac{\arcsin(cx)c^5x^5}{5}-\frac{c^3x^3\arcsin(cx)}{3}+\frac{c^4x^4\sqrt{-c^2x^2+1}}{25}-\frac{13c^2x^2\sqrt{-c^2x^2+1}}{225}-\frac{26\sqrt{-c^2x^2+1}}{225}\right)}{c^3}$
default	$\frac{-da\left(\frac{1}{5}c^5x^5-\frac{1}{3}c^3x^3\right)-db\left(\frac{\arcsin(cx)c^5x^5}{5}-\frac{c^3x^3\arcsin(cx)}{3}+\frac{c^4x^4\sqrt{-c^2x^2+1}}{25}-\frac{13c^2x^2\sqrt{-c^2x^2+1}}{225}-\frac{26\sqrt{-c^2x^2+1}}{225}\right)}{c^3}$

```
[In] int(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] -d*a*(1/5*c^2*x^5-1/3*x^3)-d*b/c^3*(1/5*arcsin(c*x)*c^5*x^5-1/3*c^3*x^3*arc
sin(c*x)+1/25*c^4*x^4*(-c^2*x^2+1)^(1/2)-13/225*c^2*x^2*(-c^2*x^2+1)^(1/2)-
26/225*(-c^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 91, normalized size of antiderivative = 0.87

$$\int x^2(d-c^2dx^2)(a+b\arcsin(cx))\,dx = -\frac{45\,ac^5dx^5-75\,ac^3dx^3+15\,(3\,bc^5dx^5-5\,bc^3dx^3)\arcsin(cx)+(9\,bc^4dx^4-13\,bc^2dx^2-26\,bd)\sqrt{-c^2x^2+1}}{225\,c^3}$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/225*(45*a*c^5*d*x^5 - 75*a*c^3*d*x^3 + 15*(3*b*c^5*d*x^5 - 5*b*c^3*d*x^3
)*arcsin(c*x) + (9*b*c^4*d*x^4 - 13*b*c^2*d*x^2 - 26*b*d)*sqrt(-c^2*x^2 + 1
))/c^3
```

Sympy [A] (verification not implemented)

Time = 0.35 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.20

$$\int x^2(d-c^2dx^2)(a+b\arcsin(cx))\,dx = \begin{cases} -\frac{ac^2dx^5}{5}+\frac{adx^3}{3}-\frac{bc^2dx^5\operatorname{asin}(cx)}{5}-\frac{bcdx^4\sqrt{-c^2x^2+1}}{25}+\frac{bdx^3\operatorname{asin}(cx)}{3}+\frac{13bdx^2\sqrt{-c^2x^2+1}}{225c}+\frac{26bd\sqrt{-c^2x^2+1}}{225c^3} & \text{for } c\neq 0 \\ \frac{adx^3}{3} & \text{otherwise} \end{cases}$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**5/5 + a*d*x**3/3 - b*c**2*d*x**5*asin(c*x)/5 - b*c*
d*x**4*sqrt(-c**2*x**2 + 1)/25 + b*d*x**3*asin(c*x)/3 + 13*b*d*x**2*sqrt(-c
**2*x**2 + 1)/(225*c) + 26*b*d*sqrt(-c**2*x**2 + 1)/(225*c**3), Ne(c, 0)),
(a*d*x**3/3, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.41

$$\int x^2(d-c^2dx^2)(a+b\arcsin(cx))\,dx = -\frac{1}{5}\,ac^2dx^5 - \frac{1}{75}\left(15\,x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bc^2d + \frac{1}{3}\,adx^3+\frac{1}{9}\left(3\,x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/5*a*c^2*d*x^5 - 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2
 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*c^2*d + 1/
3*a*d*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt
(-c^2*x^2 + 1)/c^4))*b*d
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.35

$$\int x^2(d-c^2dx^2)(a+b\arcsin(cx))\,dx = -\frac{1}{5}\,ac^2dx^5 + \frac{1}{3}\,adx^3 - \frac{(c^2x^2-1)^2bdx\arcsin{(cx)}}{5\,c^2} - \frac{(c^2x^2-1)bdx\arcsin{(cx)}}{15\,c^2} + \frac{2\,bdx\arcsin{(cx)}}{15\,c^2} - \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}bd}{25\,c^3} + \frac{(-c^2x^2+1)^{\frac{3}{2}}bd}{45\,c^3} + \frac{2\,\sqrt{-c^2x^2+1}bd}{15\,c^3}$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/5*a*c^2*d*x^5 + 1/3*a*d*x^3 - 1/5*(c^2*x^2 - 1)^2*b*d*x*arcsin(c*x)/c^2
- 1/15*(c^2*x^2 - 1)*b*d*x*arcsin(c*x)/c^2 + 2/15*b*d*x*arcsin(c*x)/c^2 - 1
/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d/c^3 + 1/45*(-c^2*x^2 + 1)^(3/2)*
b*d/c^3 + 2/15*sqrt(-c^2*x^2 + 1)*b*d/c^3
```

Mupad [F(-1)]

Timed out.

$$\int x^2(d-c^2dx^2)(a+b\arcsin(cx))\,dx = \int x^2\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)\,dx$$

```
[In] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2),x)
```

```
[Out] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2), x)
```

3.4 $\int x(d-c^2dx^2)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 90

$$\int x(d-c^2dx^2)(a+b\arcsin(cx))\,dx=\frac{3bdx\sqrt{1-c^2x^2}}{32c}+\frac{bdx(1-c^2x^2)^{3/2}}{16c}+\frac{3bd\arcsin(cx)}{32c^2}-\frac{d(1-c^2x^2)^2(a+b\arcsin(cx))}{4c^2}$$

```
[Out] 1/16*b*d*x*(-c^2*x^2+1)^(3/2)/c+3/32*b*d*arcsin(c*x)/c^2-1/4*d*(-c^2*x^2+1)
^2*(a+b*arcsin(c*x))/c^2+3/32*b*d*x*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {4767, 201, 222}

$$\int x(d-c^2dx^2)(a+b\arcsin(cx))\,dx=-\frac{d(1-c^2x^2)^2(a+b\arcsin(cx))}{4c^2}+\frac{3bd\arcsin(cx)}{32c^2}+\frac{bdx(1-c^2x^2)^{3/2}}{16c}+\frac{3bdx\sqrt{1-c^2x^2}}{32c}$$

```
[In] Int[x*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3*b*d*x*Sqrt[1 - c^2*x^2])/(32*c) + (b*d*x*(1 - c^2*x^2)^(3/2))/(16*c) + (
3*b*d*ArcSin[c*x])/(32*c^2) - (d*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(4*c^
2)
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
```

```
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{d(1-c^2x^2)^2\,(a+b\arcsin(cx))}{4c^2}+\frac{(bd)\int (1-c^2x^2)^{3/2}\,dx}{4c}\\ &= \frac{bdx(1-c^2x^2)^{3/2}}{16c}-\frac{d(1-c^2x^2)^2\,(a+b\arcsin(cx))}{4c^2}+\frac{(3bd)\int \sqrt{1-c^2x^2}\,dx}{16c}\\ &= \frac{3bdx\sqrt{1-c^2x^2}}{32c}+\frac{bdx(1-c^2x^2)^{3/2}}{16c}-\frac{d(1-c^2x^2)^2\,(a+b\arcsin(cx))}{4c^2}+\frac{(3bd)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{32c}\\ &= \frac{3bdx\sqrt{1-c^2x^2}}{32c}+\frac{bdx(1-c^2x^2)^{3/2}}{16c}+\frac{3bd\arcsin(cx)}{32c^2}-\frac{d(1-c^2x^2)^2\,(a+b\arcsin(cx))}{4c^2}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.86

$$\int x\left(d-c^2dx^2\right)(a+b\arcsin(cx))\,dx = -\frac{d\left(cx\left(8acx(-2+c^2x^2)+b\sqrt{1-c^2x^2}(-5+2c^2x^2)\right)+b(5-16c^2x^2+8c^4x^4)\arcsin(cx)\right)}{32c^2}$$

```
[In] Integrate[x*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
[Out] -1/32*(d*(c*x*(8*a*c*x*(-2 + c^2*x^2) + b*Sqrt[1 - c^2*x^2]*(-5 + 2*c^2*x^2
)) + b*(5 - 16*c^2*x^2 + 8*c^4*x^4)*ArcSin[c*x]))/c^2
```

Maple [A] (verified)

Time = 0.07 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.02

method	result	size
derivativedivides	$\frac{-\frac{da\left(c^{2}x^{2}-1\right)^{2}}{4}-db\left(\frac{c^{4}x^{4}\arcsin(cx)}{4}-\frac{c^{2}x^{2}\arcsin(cx)}{2}+\frac{5\arcsin(cx)}{32}+\frac{c^{3}x^{3}\sqrt{-c^{2}x^{2}+1}}{16}-\frac{5cx\sqrt{-c^{2}x^{2}+1}}{32}\right)}{c^{2}}$	92
default	$\frac{-\frac{da\left(c^{2}x^{2}-1\right)^{2}}{4}-db\left(\frac{c^{4}x^{4}\arcsin(cx)}{4}-\frac{c^{2}x^{2}\arcsin(cx)}{2}+\frac{5\arcsin(cx)}{32}+\frac{c^{3}x^{3}\sqrt{-c^{2}x^{2}+1}}{16}-\frac{5cx\sqrt{-c^{2}x^{2}+1}}{32}\right)}{c^{2}}$	92
parts	$-\frac{da(c^{2}x^{2}-1)^{2}}{4c^{2}}-\frac{db\left(\frac{c^{4}x^{4}\arcsin(cx)}{4}-\frac{c^{2}x^{2}\arcsin(cx)}{2}+\frac{5\arcsin(cx)}{32}+\frac{c^{3}x^{3}\sqrt{-c^{2}x^{2}+1}}{16}-\frac{5cx\sqrt{-c^{2}x^{2}+1}}{32}\right)}{c^{2}}$	94

```
[In] int(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] 1/c^2*(-1/4*d*a*(c^2*x^2-1)^2-d*b*(1/4*c^4*x^4*arcsin(c*x)-1/2*c^2*x^2*arcs
in(c*x)+5/32*arcsin(c*x)+1/16*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/32*c*x*(-c^2*x^2
+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.96

$$\int x(d-c^2dx^2)\,(a+b\arcsin(cx))\,dx = -\frac{8\,ac^4dx^4-16\,ac^2dx^2+(8\,bc^4dx^4-16\,bc^2dx^2+5\,bd)\arcsin{(cx)}+(2\,bc^3dx^3-5\,bcdx)\sqrt{-c^2x^2+1}}{32\,c^2}$$

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] -1/32*(8*a*c^4*d*x^4 - 16*a*c^2*d*x^2 + (8*b*c^4*d*x^4 - 16*b*c^2*d*x^2 + 5
*b*d)*arcsin(c*x) + (2*b*c^3*d*x^3 - 5*b*c*d*x)*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.30

$$\int x(d-c^2dx^2)\,(a+b\arcsin(cx))\,dx = \begin{cases} -\frac{ac^2dx^4}{4}+\frac{adx^2}{2}-\frac{bc^2dx^4\operatorname{asin}{(cx)}}{4}-\frac{bcdx^3\sqrt{-c^2x^2+1}}{16}+\frac{bdx^2\operatorname{asin}{(cx)}}{2}+\frac{5bdx\sqrt{-c^2x^2+1}}{32c}-\frac{5bd\operatorname{asin}{(cx)}}{32c^2} & \text{for } c\neq 0 \\ \frac{adx^2}{2} & \text{otherwise} \end{cases}$$

```
[In] integrate(x*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**4/4 + a*d*x**2/2 - b*c**2*d*x**4*asin(c*x)/4 - b*c*
d*x**3*sqrt(-c**2*x**2 + 1)/16 + b*d*x**2*asin(c*x)/2 + 5*b*d*x*sqrt(-c**2*
x**2 + 1)/(32*c) - 5*b*d*asin(c*x)/(32*c**2), Ne(c, 0)), (a*d*x**2/2, True)
)
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.42

$$\begin{aligned}\int x(d-c^2dx^2)\,(a+b\arcsin(cx))\,dx &= -\frac{1}{4}\,ac^2dx^4 \\ &\quad -\frac{1}{32}\left(8\,x^4\arcsin{(cx)}+\left(\frac{2\,\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\,\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\,\arcsin{(cx)}}{c^5}\right)c\right)bc^2d \\ &\quad +\frac{1}{2}\,adx^2+\frac{1}{4}\left(2\,x^2\arcsin{(cx)}+c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2}-\frac{\arcsin{(cx)}}{c^3}\right)\right)bd\end{aligned}$$

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/4*a*c^2*d*x^4 - 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2
+ 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*c^2*d + 1/2*a*d*x^2
+ 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*
b*d
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 100, normalized size of antiderivative = 1.11

$$\begin{aligned}\int x(d-c^2dx^2)\,(a+b\arcsin(cx))\,dx = -\frac{1}{4}\,ac^2dx^4+\frac{(-c^2x^2+1)^{\frac{3}{2}}bdx}{16\,c} \\ -\frac{(c^2x^2-1)^2bd\arcsin{(cx)}}{4\,c^2}+\frac{3\,\sqrt{-c^2x^2+1}bdx}{32\,c} \\ +\frac{(c^2x^2-1)ad}{2\,c^2}+\frac{3\,bd\arcsin{(cx)}}{32\,c^2}\end{aligned}$$

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/4*a*c^2*d*x^4 + 1/16*(-c^2*x^2 + 1)^(3/2)*b*d*x/c - 1/4*(c^2*x^2 - 1)^2*
b*d*arcsin(c*x)/c^2 + 3/32*sqrt(-c^2*x^2 + 1)*b*d*x/c + 1/2*(c^2*x^2 - 1)*a
*d/c^2 + 3/32*b*d*arcsin(c*x)/c^2
```

Mupad [F(-1)]

Timed out.

$$\int x\left(d-c^2dx^2\right)(a+b\arcsin(cx))\,dx=\int x\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)\,dx$$

```
[In] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2),x)
[Out] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2), x)
```

3.5 $\int (d - c^2 dx^2)(a + b \arcsin(cx))\,dx$

Optimal result

Integrand size = 20, antiderivative size = 77

$$\int (d - c^2 dx^2)(a + b \arcsin(cx))\,dx = \frac{2bd\sqrt{1-c^2x^2}}{3c} + \frac{bd(1-c^2x^2)^{3/2}}{9c} + dx(a + b\arcsin(cx)) - \frac{1}{3}c^2dx^3(a + b\arcsin(cx))$$

```
[Out] 1/9*b*d*(-c^2*x^2+1)^(3/2)/c+d*x*(a+b*arcsin(c*x))-1/3*c^2*d*x^3*(a+b*arcsi
n(c*x))+2/3*b*d*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4739, 12, 455, 45}

$$\int (d - c^2 dx^2)(a + b \arcsin(cx))\,dx = -\frac{1}{3}c^2dx^3(a + b\arcsin(cx)) + dx(a + b\arcsin(cx)) + \frac{bd(1-c^2x^2)^{3/2}}{9c} + \frac{2bd\sqrt{1-c^2x^2}}{3c}$$

```
[In] Int[(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d*Sqrt[1 - c^2*x^2])/(3*c) + (b*d*(1 - c^2*x^2)^(3/2))/(9*c) + d*x*(a
+ b*ArcSin[c*x]) - (c^2*d*x^3*(a + b*ArcSin[c*x]))/3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= dx(a+b\arcsin(cx)) - \frac{1}{3}c^2dx^3(a+b\arcsin(cx)) - (bc)\int \frac{dx\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx \\
&= dx(a+b\arcsin(cx)) - \frac{1}{3}c^2dx^3(a+b\arcsin(cx)) - (bcd)\int \frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx \\
&= dx(a+b\arcsin(cx)) - \frac{1}{3}c^2dx^3(a+b\arcsin(cx)) - \frac{1}{2}(bcd)\text{Subst}\left(\int \frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx, x, x^2\right) \\
&= dx(a+b\arcsin(cx)) - \frac{1}{3}c^2dx^3(a+b\arcsin(cx)) \\
&\quad - \frac{1}{2}(bcd)\text{Subst}\left(\int \left(\frac{2}{3\sqrt{1-c^2x}} + \frac{1}{3}\sqrt{1-c^2x}\right)\,dx, x, x^2\right) \\
&= \frac{2bd\sqrt{1-c^2x^2}}{3c} + \frac{bd(1-c^2x^2)^{3/2}}{9c} + dx(a+b\arcsin(cx)) - \frac{1}{3}c^2dx^3(a+b\arcsin(cx))
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.14

$$\int (d-c^2dx^2)(a+b\arcsin(cx))\,dx = adx - \frac{1}{3}ac^2dx^3 + \frac{7bd\sqrt{1-c^2x^2}}{9c} - \frac{1}{9}bcdx^2\sqrt{1-c^2x^2} + bdx\arcsin(cx) - \frac{1}{3}bc^2dx^3\arcsin(cx)$$

```
[In] Integrate[(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
[Out] a*d*x - (a*c^2*d*x^3)/3 + (7*b*d*Sqrt[1 - c^2*x^2])/(9*c) - (b*c*d*x^2*Sqrt
[1 - c^2*x^2])/9 + b*d*x*ArcSin[c*x] - (b*c^2*d*x^3*ArcSin[c*x])/3
```

Maple [A] (verified)

Time = 0.01 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.04

method	result	size
parts	$-da\left(\frac{1}{3}c^2x^3-x\right)-\frac{db\left(\frac{c^3x^3\arcsin(cx)}{3}-cx\arcsin(cx)+\frac{c^2x^2\sqrt{-c^2x^2+1}}{9}-\frac{7\sqrt{-c^2x^2+1}}{9}\right)}{c}$	80
derivativedivides	$\frac{-da\left(\frac{1}{3}c^3x^3-cx\right)-db\left(\frac{c^3x^3\arcsin(cx)}{3}-cx\arcsin(cx)+\frac{c^2x^2\sqrt{-c^2x^2+1}}{9}-\frac{7\sqrt{-c^2x^2+1}}{9}\right)}{c}$	82
default	$\frac{-da\left(\frac{1}{3}c^3x^3-cx\right)-db\left(\frac{c^3x^3\arcsin(cx)}{3}-cx\arcsin(cx)+\frac{c^2x^2\sqrt{-c^2x^2+1}}{9}-\frac{7\sqrt{-c^2x^2+1}}{9}\right)}{c}$	82

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] -d*a*(1/3*c^2*x^3-x)-d*b/c*(1/3*c^3*x^3*arcsin(c*x)-c*x*arcsin(c*x)+1/9*c^2
*x^2*(-c^2*x^2+1)^(1/2)-7/9*(-c^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.92

$$\int (d-c^2dx^2)(a+b\arcsin(cx))\,dx = -\frac{3\,ac^3dx^3 - 9\,acdx + 3\,(bc^3dx^3 - 3\,bcdx)\arcsin(cx) + (bc^2dx^2 - 7\,bd)\sqrt{-c^2x^2+1}}{9\,c}$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] -1/9*(3*a*c^3*d*x^3 - 9*a*c*d*x + 3*(b*c^3*d*x^3 - 3*b*c*d*x)*arcsin(c*x) +
 (b*c^2*d*x^2 - 7*b*d)*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.17

$$\int (d - c^2dx^2)(a + b\arcsin(cx))\,dx$$
$$= \begin{cases} -\frac{ac^2dx^3}{3} + adx - \frac{bc^2dx^3 \operatorname{asin}(cx)}{3} - \frac{bcdx^2\sqrt{-c^2x^2+1}}{9} + bdx\operatorname{asin}(cx) + \frac{7bd\sqrt{-c^2x^2+1}}{9c} & \text{for } c \neq 0 \\ adx & \text{otherwise} \end{cases}$$

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**2*d*x**3/3 + a*d*x - b*c**2*d*x**3*asin(c*x)/3 - b*c*d*x**
2*sqrt(-c**2*x**2 + 1)/9 + b*d*x*asin(c*x) + 7*b*d*sqrt(-c**2*x**2 + 1)/(9*
c), Ne(c, 0)), (a*d*x, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.26

$$\int (d - c^2dx^2)(a + b\arcsin(cx))\,dx$$
$$= -\frac{1}{3}ac^2dx^3 - \frac{1}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bc^2d$$
$$+ adx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd}{c}$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/3*a*c^2*d*x^3 - 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 +
 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^2*d + a*d*x + (c*x*arcsin(c*x) + sqrt(-c^2*
x^2 + 1))*b*d/c
```

Giac [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.04

$$\int (d - c^2dx^2)(a + b\arcsin(cx))\,dx = -\frac{1}{3}ac^2dx^3 - \frac{1}{3}(c^2x^2-1)bdx\arcsin(cx)$$
$$+ \frac{2}{3}bdx\arcsin(cx) + adx$$
$$+ \frac{(-c^2x^2+1)^{\frac{3}{2}}bd}{9c} + \frac{2\sqrt{-c^2x^2+1}bd}{3c}$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/3*a*c^2*d*x^3 - 1/3*(c^2*x^2 - 1)*b*d*x*arcsin(c*x) + 2/3*b*d*x*arcsin(c
*x) + a*d*x + 1/9*(-c^2*x^2 + 1)^(3/2)*b*d/c + 2/3*sqrt(-c^2*x^2 + 1)*b*d/c
```

Mupad [F(-1)]

Timed out.

$$\int (d-c^2dx^2)\,(a+b\arcsin(cx))\,dx$$
$$=\begin{cases} \frac{b\,d\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c}-b\,c^2\,d\,\left(\frac{\sqrt{\frac{1}{c^2}-x^2}\,\left(\frac{2}{c^2}+x^2\right)}{9}+\frac{x^3\,\mathrm{asin}(c\,x)}{3}\right)-\frac{a\,d\,x\,\left(c^2\,x^2-3\right)}{3} & \text{if } 0<c \\ \int (a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)\,dx & \text{if } \neg 0<c \end{cases}$$

```
[In] int((a + b*asin(c*x))*(d - c^2*d*x^2),x)
```

```
[Out] piecewise(0 < c, - b*c^2*d*(((1/c^2 - x^2)^(1/2)*(2/c^2 + x^2))/9 + (x^3*as
in(c*x))/3) + (b*d*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)))/c - (a*d*x*(c^2
*x^2 - 3))/3, ~0 < c, int((a + b*asin(c*x))*(d - c^2*d*x^2), x))
```

3.6 $\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 121

$$\begin{aligned}\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x}\,dx = & -\frac{1}{4}bcdx\sqrt{1-c^2x^2}-\frac{1}{4}bd\arcsin(cx) \\ & +\frac{1}{2}d(1-c^2x^2)(a+b\arcsin(cx)) \\ & -\frac{id(a+b\arcsin(cx))^2}{2b} \\ & +d(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) \\ & -\frac{1}{2}ibd\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\end{aligned}$$

```
[Out] -1/4*b*d*arcsin(c*x)+1/2*d*(-c^2*x^2+1)*(a+b*arcsin(c*x))-1/2*I*d*(a+b*arcs
in(c*x))^2/b+d*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*I*b
*d*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/4*b*c*d*x*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {4773, 4721, 3798, 2221, 2317, 2438, 201, 222}

$$\begin{aligned}\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x}\,dx = & \frac{1}{2}d(1-c^2x^2)(a+b\arcsin(cx))-\frac{id(a+b\arcsin(cx))^2}{2b} \\ & +d\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx)) \\ & -\frac{1}{2}ibd\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) \\ & -\frac{1}{4}bd\arcsin(cx)-\frac{1}{4}bcdx\sqrt{1-c^2x^2}\end{aligned}$$

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -1/4*(b*c*d*x*Sqrt[1 - c^2*x^2]) - (b*d*ArcSin[c*x])/4 + (d*(1 - c^2*x^2)*(
a + b*ArcSin[c*x]))/2 - ((I/2)*d*(a + b*ArcSin[c*x])^2)/b + d*(a + b*ArcSin
[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] - (I/2)*b*d*PolyLog[2, E^((2*I)*ArcSi
n[c*x])]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{2}d\left(1-c^2x^2\right)(a+b\arcsin(cx))+d\int\frac{a+b\arcsin(cx)}{x}\,dx-\frac{1}{2}(bcd)\int\sqrt{1-c^2x^2}\,dx\\
&= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}+\frac{1}{2}d\left(1-c^2x^2\right)(a+b\arcsin(cx))\\
&\quad+d\text{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)-\frac{1}{4}(bcd)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx\\
&= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}-\frac{1}{4}bd\arcsin(cx)+\frac{1}{2}d\left(1-c^2x^2\right)(a+b\arcsin(cx))\\
&\quad-\frac{id(a+b\arcsin(cx))^2}{2b}-(2id)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right)\\
&= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}-\frac{1}{4}bd\arcsin(cx)+\frac{1}{2}d\left(1-c^2x^2\right)(a+b\arcsin(cx))-\frac{id(a+b\arcsin(cx))^2}{2b}\\
&\quad+d(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)-(bd)\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)\\
&= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}-\frac{1}{4}bd\arcsin(cx)+\frac{1}{2}d\left(1-c^2x^2\right)(a+b\arcsin(cx))-\frac{id(a+b\arcsin(cx))^2}{2b}\\
&\quad+d(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)+\frac{1}{2}(ibd)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)\\
&= -\frac{1}{4}bcdx\sqrt{1-c^2x^2}-\frac{1}{4}bd\arcsin(cx)+\frac{1}{2}d\left(1-c^2x^2\right)(a\\
&\qquad+b\arcsin(cx))-\frac{id(a+b\arcsin(cx))^2}{2b}\\
&\quad+d(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)-\frac{1}{2}ibd\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.95

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x}\,dx = -\frac{1}{2}ac^2dx^2-\frac{1}{4}bcdx\sqrt{1-c^2x^2} + \frac{1}{4}bd\arcsin(cx)-\frac{1}{2}bc^2dx^2\arcsin(cx) + bd\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right)+ad\log(x) - \frac{1}{2}ibd\left(\arcsin(cx)^2+\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\right)$$

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -1/2*(a*c^2*d*x^2) - (b*c*d*x*Sqrt[1 - c^2*x^2])/4 + (b*d*ArcSin[c*x])/4 -
(b*c^2*d*x^2*ArcSin[c*x])/2 + b*d*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])
] + a*d*Log[x] - (I/2)*b*d*(ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x]
)])
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.30

method	result
parts	$-da\left(\frac{c^2x^2}{2}-\ln(x)\right)-db\left(\frac{i\arcsin(cx)^2}{2}-\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+i\,\text{polylo}\right.$
derivativedivides	$-da\left(\frac{c^2x^2}{2}-\ln(cx)\right)-db\left(\frac{i\arcsin(cx)^2}{2}-\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+i\,\text{poly}\right.$
default	$-da\left(\frac{c^2x^2}{2}-\ln(cx)\right)-db\left(\frac{i\arcsin(cx)^2}{2}-\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+i\,\text{poly}\right.$

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] -d*a*(1/2*c^2*x^2-ln(x))-d*b*(1/2*I*arcsin(c*x)^2-arcsin(c*x)*ln(1+I*c*x+(-
c^2*x^2+1)^(1/2))+I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-arcsin(c*x)*ln(1-I
*c*x-(-c^2*x^2+1)^(1/2))+I*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/4*arcsin(c
*x)*cos(2*arcsin(c*x))+1/8*sin(2*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x}\,dx = \int -\frac{(c^2dx^2-d)(b\arcsin(cx)+a)}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))/x, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x}\,dx = -d\left(\int\left(-\frac{a}{x}\right)dx + \int ac^2x\,dx + \int\left(-\frac{b\operatorname{asin}(cx)}{x}\right)dx + \int bc^2x\operatorname{asin}(cx)\,dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))/x,x)
[Out] -d*(Integral(-a/x, x) + Integral(a*c**2*x, x) + Integral(-b*asin(c*x)/x, x)
 + Integral(b*c**2*x*asin(c*x), x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x}\,dx = \int -\frac{(c^2dx^2-d)(b\arcsin(cx)+a)}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
[Out] -1/2*a*c^2*d*x^2 + a*d*log(x) - integrate((b*c^2*d*x^2 - b*d)*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Giac [F]

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x}\,dx = \int -\frac{(c^2dx^2-d)(b\arcsin(cx)+a)}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\;(d-c^2\,d\,x^2)}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2))/x,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2))/x, x)
```

3.7 $\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 69

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^2}\,dx = -bcd\sqrt{1-c^2x^2} - \frac{d(a+b\arcsin(cx))}{x} - c^2dx(a+b\arcsin(cx)) - bcd\,\mathrm{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -d*(a+b*arcsin(c*x))/x-c^2*d*x*(a+b*arcsin(c*x))-b*c*d*arctanh((-c^2*x^2+1)
^(1/2))-b*c*d*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {14, 4777, 12, 457, 81, 65, 214}

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^2}\,dx = c^2(-d)x(a+b\arcsin(cx)) - \frac{d(a+b\arcsin(cx))}{x} - bcd\,\mathrm{arctanh}\left(\sqrt{1-c^2x^2}\right) - bcd\sqrt{1-c^2x^2}$$

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -(b*c*d*Sqrt[1 - c^2*x^2]) - (d*(a + b*ArcSin[c*x]))/x - c^2*d*x*(a + b*Arc
Sin[c*x]) - b*c*d*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 81

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[b*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/(d*f*(n + p +
 2))), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\text{integral} = -\frac{d(a+b\arcsin(cx))}{x} - c^2dx(a+b\arcsin(cx)) - (bc)\int \frac{d(-1-c^2x^2)}{x\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{d(a + b\arcsin(cx))}{x} - c^2dx(a + b\arcsin(cx)) - (bcd)\int \frac{-1 - c^2x^2}{x\sqrt{1 - c^2x^2}}\,dx$$

$$= -\frac{d(a + b\arcsin(cx))}{x} - c^2dx(a+b\arcsin(cx)) - \frac{1}{2}(bcd)\text{Subst}\left(\int \frac{-1 - c^2x}{x\sqrt{1 - c^2x}}\,dx, x, x^2\right)$$

$$= -bcd\sqrt{1 - c^2x^2} - \frac{d(a + b\arcsin(cx))}{x} - c^2dx(a + b\arcsin(cx)) + \frac{1}{2}(bcd)\text{Subst}\left(\int \frac{1}{x\sqrt{1 - c^2x}}\,dx, x, x^2\right)$$

$$= -bcd\sqrt{1 - c^2x^2} - \frac{d(a + b\arcsin(cx))}{x} - c^2dx(a + b\arcsin(cx)) - \frac{(bd)\text{Subst}\left(\int \frac{1}{\frac{1}{c^2} - \frac{x^2}{c^2}}\,dx, x, \sqrt{1 - c^2x^2}\right)}{c}$$

$$= -bcd\sqrt{1 - c^2x^2} - \frac{d(a + b\arcsin(cx))}{x} - c^2dx(a+b\arcsin(cx)) - bcd\,\text{arctanh}\left(\sqrt{1 - c^2x^2}\right)$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 78, normalized size of antiderivative = 1.13

$$\int \frac{(d - c^2dx^2)(a + b\arcsin(cx))}{x^2}\,dx = -\frac{ad}{x} - ac^2dx - bcd\sqrt{1 - c^2x^2} - \frac{bd\arcsin(cx)}{x} - bc^2dx\arcsin(cx) - bcd\,\text{arctanh}\left(\sqrt{1 - c^2x^2}\right)$$

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^2,x]
[Out] -((a*d)/x) - a*c^2*d*x - b*c*d*Sqrt[1 - c^2*x^2] - (b*d*ArcSin[c*x])/x - b*
c^2*d*x*ArcSin[c*x] - b*c*d*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Maple [A] (verified)

Time = 0.02 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.93

method	result
parts	$-da\left(c^2x + \frac{1}{x}\right) - dbc\left(cx\arcsin(cx) + \frac{\arcsin(cx)}{cx} + \sqrt{-c^2x^2+1} + \text{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)\right)$
derivativedivides	$c\left(-da\left(cx + \frac{1}{cx}\right) - db\left(cx\arcsin(cx) + \frac{\arcsin(cx)}{cx} + \sqrt{-c^2x^2+1} + \text{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)\right)\right)$
default	$c\left(-da\left(cx + \frac{1}{cx}\right) - db\left(cx\arcsin(cx) + \frac{\arcsin(cx)}{cx} + \sqrt{-c^2x^2+1} + \text{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)\right)\right)$

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -d*a*(c^2*x+1/x)-d*b*c*(c*x*arcsin(c*x)+1/c/x*arcsin(c*x)+(-c^2*x^2+1)^(1/2
)+arctanh(1/(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.42

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^2}\,dx = -\frac{2\,ac^2dx^2+bcdx\log\left(\sqrt{-c^2x^2+1}+1\right)-bcdx\log\left(\sqrt{-c^2x^2+1}-1\right)+2\sqrt{-c^2x^2+1}bcdx+2\,ad+2\,(b}{2\,x}$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] -1/2*(2*a*c^2*d*x^2 + b*c*d*x*log(sqrt(-c^2*x^2 + 1) + 1) - b*c*d*x*log(sqr
t(-c^2*x^2 + 1) - 1) + 2*sqrt(-c^2*x^2 + 1)*b*c*d*x + 2*a*d + 2*(b*c^2*d*x^
2 + b*d)*arcsin(c*x))/x
```

Sympy [A] (verification not implemented)

Time = 1.80 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.19

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^2}\,dx = -ac^2dx-\frac{ad}{x} - bc^2d\left(\begin{cases}0 & \text{for } c=0\\ x\operatorname{asin}(cx)+\frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise}\end{cases}\right) + bcd\left(\begin{cases}-\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|}>1\\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right)-\frac{bd\operatorname{asin}(cx)}{x}$$

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*c**2*d*x - a*d/x - b*c**2*d*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt
(-c**2*x**2 + 1)/c, True)) + b*c*d*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x
**2) > 1), (I*asin(1/(c*x)), True)) - b*d*asin(c*x)/x
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.19

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^2}\,dx = -ac^2dx - \left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bcd - \left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\arcsin(cx)}{x}\right)bd - \frac{ad}{x}$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] -a*c^2*d*x - (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*c*d - (c*log(2*sqrt(-
c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*d - a*d/x
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 856 vs. 2(65) = 130.

Time = 1.10 (sec) , antiderivative size = 856, normalized size of antiderivative = 12.41

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))}{x^2}\,dx$$

$$= -\frac{bc^5dx^4\arcsin(cx)}{2\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)^4} - \frac{ac^5dx^4}{2\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)^4} + \frac{bc^4dx^3\log(|c||x|)}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)^3} - \frac{bc^4dx^3\log\left(\sqrt{-c^2x^2+1}+1\right)}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)^3} + \frac{bc^4dx^3}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)^3} - \frac{3\,bc^3dx^2\arcsin(cx)}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)^2} - \frac{3\,ac^3dx^2}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)^2} + \frac{bc^2dx\log(|c||x|)}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)} - \frac{bc^2dx\log\left(\sqrt{-c^2x^2+1}+1\right)}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)} - \frac{bc^2dx}{\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)\left(\sqrt{-c^2x^2+1}+1\right)} - \frac{bcd\arcsin(cx)}{2\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)} - \frac{acd}{2\left(\frac{c^3x^3}{\left(\sqrt{-c^2x^2+1}+1\right)^3}+\frac{cx}{\sqrt{-c^2x^2+1}+1}\right)}$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^5*d*x^4*arcsin(c*x)/((c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sq
rt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) - 1/2*a*c^5*d*x^4/((c^3*
x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x
^2 + 1) + 1)^4) + b*c^4*d*x^3*log(abs(c)*abs(x))/((c^3*x^3/(sqrt(-c^2*x^2 +
 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - b*
c^4*d*x^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3
+ c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) + b*c^4*d*x^3/(
(c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-
c^2*x^2 + 1) + 1)^3) - 3*b*c^3*d*x^2*arcsin(c*x)/((c^3*x^3/(sqrt(-c^2*x^2 +
 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 3*
a*c^3*d*x^2/((c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1)
+ 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + b*c^2*d*x*log(abs(c)*abs(x))/((c^3*x^3/
(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
 1) + 1)) - b*c^2*d*x*log(sqrt(-c^2*x^2 + 1) + 1)/((c^3*x^3/(sqrt(-c^2*x^2
+ 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - b*c
^2*d*x/((c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))
*(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*b*c*d*arcsin(c*x)/(c^3*x^3/(sqrt(-c^2*x^2
+ 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*a*c*d/(c^3*x^3/(sqrt(-c^2
*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))
```

Mupad [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 71, normalized size of antiderivative = 1.03

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))}{x^2}\,dx = -\frac{a\,d\,(c^2\,x^2+1)}{x} - b\,c\,d\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right) - \frac{b\,d\,\mathrm{asin}(c\,x)}{x} - b\,c\,d\,\mathrm{atanh}\left(\frac{1}{\sqrt{1-c^2\,x^2}}\right)$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2))/x^2,x)
```

```
[Out] - (a*d*(c^2*x^2 + 1))/x - b*c*d*((1 - c^2*x^2)^(1/2) + c*x*asin(c*x)) - (b*
d*asin(c*x))/x - b*c*d*atanh(1/(1 - c^2*x^2)^(1/2))
```

3.8 $\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 139

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^3}\,dx = -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}bc^2d\arcsin(cx) - \frac{d(1-c^2x^2)(a+b\arcsin(cx))}{2x^2} + \frac{ic^2d(a+b\arcsin(cx))^2}{2b} - c^2d(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) + \frac{1}{2}ibc^2d\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)$$

```
[Out] -1/2*b*c^2*d*arcsin(c*x)-1/2*d*(-c^2*x^2+1)*(a+b*arcsin(c*x))/x^2+1/2*I*c^2
*d*(a+b*arcsin(c*x))^2/b-c^2*d*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(
1/2))^2)+1/2*I*b*c^2*d*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b*c*d*(-
c^2*x^2+1)^(1/2)/x
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used

$= \{4775, 283, 222, 4721, 3798, 2221, 2317, 2438\}$

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^3}\,dx = -\frac{d(1-c^2x^2)(a+b\arcsin(cx))}{2x^2} + \frac{ic^2d(a+b\arcsin(cx))^2}{2b} - c^2d\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx)) + \frac{1}{2}ibc^2d\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) - \frac{1}{2}bc^2d\arcsin(cx) - \frac{bcd\sqrt{1-c^2x^2}}{2x}$$

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(b*c*d*Sqrt[1 - c^2*x^2])/x - (b*c^2*d*ArcSin[c*x])/2 - (d*(1 - c^2*x^
2)*(a + b*ArcSin[c*x]))/(2*x^2) + ((I/2)*c^2*d*(a + b*ArcSin[c*x])^2)/b - c
^2*d*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] + (I/2)*b*c^2*d*Pol
yLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 283

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^p/(c*(m + 1))), x] - Dist[b*n*(p/(c^n*(m + 1))), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcSin[c*x
])/(f*(m + 1))), x] + (-Dist[b*c*(d^p/(f*(m + 1))), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{d(1-c^2x^2)\,(a+b\arcsin(cx))}{2x^2} \\
&\quad+\frac{1}{2}(bcd)\int\frac{\sqrt{1-c^2x^2}}{x^2}\,dx-\left(c^2d\right)\int\frac{a+b\arcsin(cx)}{x}\,dx \\
&= -\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{d(1-c^2x^2)\,(a+b\arcsin(cx))}{2x^2} \\
&\quad-\left(c^2d\right)\text{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)-\frac{1}{2}\left(bc^3d\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{1}{2}bc^2d\arcsin(cx)-\frac{d(1-c^2x^2)\,(a+b\arcsin(cx))}{2x^2} \\
&\quad+\frac{ic^2d(a+b\arcsin(cx))^2}{2b}+\left(2ic^2d\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right) \\
&= -\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{1}{2}bc^2d\arcsin(cx)-\frac{d(1-c^2x^2)\,(a+b\arcsin(cx))}{2x^2} \\
&\quad+\frac{ic^2d(a+b\arcsin(cx))^2}{2b}-c^2d(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) \\
&\quad+\left(bc^2d\right)\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)
\end{aligned}
$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}bc^2d\arcsin(cx) - \frac{d(1-c^2x^2)(a+b\arcsin(cx))}{2x^2} + \frac{ic^2d(a+b\arcsin(cx))^2}{2b} - c^2d(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) - \frac{1}{2}(ibc^2d)\,\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}bc^2d\arcsin(cx) - \frac{d(1-c^2x^2)(a+b\arcsin(cx))}{2x^2} + \frac{ic^2d(a+b\arcsin(cx))^2}{2b} - c^2d(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) + \frac{1}{2}ibc^2d\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.81

$$\int\frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^3}\,dx = -\frac{ad}{2x^2} - \frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{bd\arcsin(cx)}{2x^2} - bc^2d\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - ac^2d\log(x) + \frac{1}{2}ibc^2d\left(\arcsin(cx)^2 + \text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)\right)$$

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(a*d)/x^2 - (b*c*d*Sqrt[1 - c^2*x^2])/(2*x) - (b*d*ArcSin[c*x])/(2*x^2
) - b*c^2*d*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - a*c^2*d*Log[x] + (
I/2)*b*c^2*d*(ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x])])
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.24

method	result
parts	$-\frac{da}{2x^2} - da\,c^2\ln(x) - db\,c^2\Big(-\frac{i\arcsin(cx)^2}{2} + \frac{-ic^2x^2+cx\sqrt{-c^2x^2+1}+\arcsin(cx)}{2c^2x^2} + \arcsin(cx)\ln\big(1$
derivativedivides	$c^2\Big(-da\big(\frac{1}{2c^2x^2} + \ln(cx)\big) - db\Big(-\frac{i\arcsin(cx)^2}{2} + \frac{-ic^2x^2+cx\sqrt{-c^2x^2+1}+\arcsin(cx)}{2c^2x^2} + \arcsin(cx)\ln\big($
default	$c^2\Big(-da\big(\frac{1}{2c^2x^2} + \ln(cx)\big) - db\Big(-\frac{i\arcsin(cx)^2}{2} + \frac{-ic^2x^2+cx\sqrt{-c^2x^2+1}+\arcsin(cx)}{2c^2x^2} + \arcsin(cx)\ln\big($

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*d*a/x^2-d*a*c^2*ln(x)-d*b*c^2*(-1/2*I*arcsin(c*x)^2+1/2*(-I*c^2*x^2+c*
x*(-c^2*x^2+1)^(1/2)+arcsin(c*x))/c^2/x^2+arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+
```

```
1)^(1/2))+arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*polylog(2,-I*c*x-(-c
^2*x^2+1)^(1/2))-I*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))}{x^3}\,dx = \int -\frac{(c^2dx^2-d)(b\arcsin(cx)+a)}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))/x^3, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))}{x^3}\,dx = -d\left(\int \left(-\frac{a}{x^3}\right)\,dx + \int \frac{ac^2}{x}\,dx + \int \left(-\frac{b\,\mathrm{asin}\,(cx)}{x^3}\right)\,dx + \int \frac{bc^2\,\mathrm{asin}\,(cx)}{x}\,dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))/x**3,x)
[Out] -d*(Integral(-a/x**3, x) + Integral(a*c**2/x, x) + Integral(-b*asin(c*x)/x*
*3, x) + Integral(b*c**2*asin(c*x)/x, x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))}{x^3}\,dx = \int -\frac{(c^2dx^2-d)(b\arcsin(cx)+a)}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
[Out] -b*c^2*d*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x) - a*c^2
*d*log(x) - 1/2*b*d*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) - 1/2*a*d/x^
2
```

Giac [F]

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^3}\,dx = \int -\frac{(c^2dx^2-d)(b\arcsin(cx)+a)}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)/x^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)}{x^3}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2))/x^3,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2))/x^3, x)
```

3.9 $\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^4} dx$

Optimal result

Integrand size = 23, antiderivative size = 81

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^4} dx = -\frac{bcd\sqrt{1-c^2x^2}}{6x^2} - \frac{d(a+b\arcsin(cx))}{3x^3} + \frac{c^2d(a+b\arcsin(cx))}{x} + \frac{5}{6}bc^3d\text{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -1/3*d*(a+b*arcsin(c*x))/x^3+c^2*d*(a+b*arcsin(c*x))/x+5/6*b*c^3*d*arctanh(
(-c^2*x^2+1)^(1/2))-1/6*b*c*d*(-c^2*x^2+1)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {14, 4777, 12, 457, 79, 65, 214}

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^4} dx = \frac{c^2d(a+b\arcsin(cx))}{x} - \frac{d(a+b\arcsin(cx))}{3x^3} + \frac{5}{6}bc^3d\text{arctanh}\left(\sqrt{1-c^2x^2}\right) - \frac{bcd\sqrt{1-c^2x^2}}{6x^2}$$

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/6*(b*c*d*Sqrt[1 - c^2*x^2])/x^2 - (d*(a + b*ArcSin[c*x]))/(3*x^3) + (c^2
*d*(a + b*ArcSin[c*x]))/x + (5*b*c^3*d*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(-(b*e - a*f))*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/
(f*(p + 1)*(c*f - d*e))), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c
*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x]
, x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || I
ntegerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))
))
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{d(a+b\arcsin(cx))}{3x^3}+\frac{c^2d(a+b\arcsin(cx))}{x}-(bc)\int\frac{d(-1+3c^2x^2)}{3x^3\sqrt{1-c^2x^2}}\,dx\\
&= -\frac{d(a+b\arcsin(cx))}{3x^3}+\frac{c^2d(a+b\arcsin(cx))}{x}-\frac{1}{3}(bcd)\int\frac{-1+3c^2x^2}{x^3\sqrt{1-c^2x^2}}\,dx\\
&= -\frac{d(a+b\arcsin(cx))}{3x^3}+\frac{c^2d(a+b\arcsin(cx))}{x}-\frac{1}{6}(bcd)\text{Subst}\left(\int\frac{-1+3c^2x}{x^2\sqrt{1-c^2x}}\,dx,x,x^2\right)\\
&= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d(a+b\arcsin(cx))}{3x^3}+\frac{c^2d(a+b\arcsin(cx))}{x}\\
&\quad-\frac{1}{12}\left(5bc^3d\right)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)\\
&= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d(a+b\arcsin(cx))}{3x^3}+\frac{c^2d(a+b\arcsin(cx))}{x}\\
&\quad+\frac{1}{6}(5bcd)\text{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)\\
&= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d(a+b\arcsin(cx))}{3x^3}+\frac{c^2d(a+b\arcsin(cx))}{x}+\frac{5}{6}bc^3d\text{arctanh}\left(\sqrt{1-c^2x^2}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.15

$$
\int\frac{(d-c^2dx^2)\,(a+b\arcsin(cx))}{x^4}\,dx=-\frac{ad}{3x^3}+\frac{ac^2d}{x}-\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{bd\arcsin(cx)}{3x^3}+\frac{bc^2d\arcsin(cx)}{x}+\frac{5}{6}bc^3d\text{arctanh}\left(\sqrt{1-c^2x^2}\right)
$$

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/3*(a*d)/x^3 + (a*c^2*d)/x - (b*c*d*Sqrt[1 - c^2*x^2])/(6*x^2) - (b*d*Arc
Sin[c*x])/(3*x^3) + (b*c^2*d*ArcSin[c*x])/x + (5*b*c^3*d*ArcTanh[Sqrt[1 - c
^2*x^2]])/6
```

Maple [A] (verified)

Time = 0.02 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.07

method	result	size
parts	$-da\left(-\frac{c^{2}}{x}+\frac{1}{3x^{3}}\right)-db\,c^{3}\left(\frac{\arcsin(cx)}{3c^{3}x^{3}}-\frac{\arcsin(cx)}{cx}+\frac{\sqrt{-c^{2}x^{2}+1}}{6c^{2}x^{2}}-\frac{5\,\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^{2}x^{2}+1}}\right)}{6}\right)$	87
derivativedivides	$c^{3}\left(-da\left(\frac{1}{3c^{3}x^{3}}-\frac{1}{cx}\right)-db\left(\frac{\arcsin(cx)}{3c^{3}x^{3}}-\frac{\arcsin(cx)}{cx}+\frac{\sqrt{-c^{2}x^{2}+1}}{6c^{2}x^{2}}-\frac{5\,\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^{2}x^{2}+1}}\right)}{6}\right)\right)$	91
default	$c^{3}\left(-da\left(\frac{1}{3c^{3}x^{3}}-\frac{1}{cx}\right)-db\left(\frac{\arcsin(cx)}{3c^{3}x^{3}}-\frac{\arcsin(cx)}{cx}+\frac{\sqrt{-c^{2}x^{2}+1}}{6c^{2}x^{2}}-\frac{5\,\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^{2}x^{2}+1}}\right)}{6}\right)\right)$	91

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -d*a*(-c^2/x+1/3/x^3)-d*b*c^3*(1/3/c^3/x^3*arcsin(c*x)-1/c/x*arcsin(c*x)+1/
6/c^2/x^2*(-c^2*x^2+1)^(1/2)-5/6*arctanh(1/(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.35

$$\int\frac{(d-c^{2}dx^{2})\,(a+b\arcsin(cx))}{x^{4}}\,dx$$
$$=\frac{5\,bc^{3}dx^{3}\log\left(\sqrt{-c^{2}x^{2}+1}+1\right)-5\,bc^{3}dx^{3}\log\left(\sqrt{-c^{2}x^{2}+1}-1\right)+12\,ac^{2}dx^{2}-2\sqrt{-c^{2}x^{2}+1}bcdx-4\,ad+}{12\,x^{3}}$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] 1/12*(5*b*c^3*d*x^3*log(sqrt(-c^2*x^2 + 1) + 1) - 5*b*c^3*d*x^3*log(sqrt(-c
^2*x^2 + 1) - 1) + 12*a*c^2*d*x^2 - 2*sqrt(-c^2*x^2 + 1)*b*c*d*x - 4*a*d +
4*(3*b*c^2*d*x^2 - b*d)*arcsin(c*x))/x^3
```

Sympy [A] (verification not implemented)

Time = 3.02 (sec) , antiderivative size = 177, normalized size of antiderivative = 2.19

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^4}\,dx$$
$$= \frac{ac^2d}{x} - \frac{ad}{3x^3} - bc^3d\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|} > 1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) + \frac{bc^2d\operatorname{asin}(cx)}{x}$$
$$+ \frac{bcd\left(\begin{cases} -\frac{c^2\operatorname{acosh}\left(\frac{1}{cx}\right)}{2} + \frac{c}{2x\sqrt{-1+\frac{1}{c^2x^2}}} - \frac{1}{2cx^3\sqrt{-1+\frac{1}{c^2x^2}}} & \text{for } \frac{1}{|c^2x^2|} > 1 \\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx}\right)}{2} - \frac{ic\sqrt{1-\frac{1}{c^2x^2}}}{2x} & \text{otherwise} \end{cases}\right)}{3} - \frac{bd\operatorname{asin}(cx)}{3x^3}$$

[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))/x**4,x)

[Out] a*c**2*d/x - a*d/(3*x**3) - b*c**3*d*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)) + b*c**2*d*asin(c*x)/x + b*c*d*Piecewise((-c**2*acosh(1/(c*x))/2 + c/(2*x*sqrt(-1 + 1/(c**2*x**2))) - 1/(2*c*x**3*sqrt(-1 + 1/(c**2*x**2))), 1/Abs(c**2*x**2) > 1), (I*c**2*asin(1/(c*x))/2 - I*c*sqrt(1 - 1/(c**2*x**2))/(2*x), True))/3 - b*d*asin(c*x)/(3*x**3)

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 123, normalized size of antiderivative = 1.52

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^4}\,dx$$
$$= \left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\arcsin(cx)}{x}\right)bc^2d$$
$$- \frac{1}{6}\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\sqrt{-c^2x^2+1}}{x^2}\right)c + \frac{2\arcsin(cx)}{x^3}\right)bd$$
$$+ \frac{ac^2d}{x} - \frac{ad}{3x^3}$$

[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")

[Out] (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*c^2*d - 1/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)/x^2)*c + 2*arcsin(c*x)/x^3)*b*d + a*c^2*d/x - 1/3*a*d/x^3

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 296 vs. $2(71) = 142$.

Time = 4.56 (sec) , antiderivative size = 296, normalized size of antiderivative = 3.65

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^4}\,dx = -\frac{bc^6dx^3\arcsin(cx)}{24\left(\sqrt{-c^2x^2+1}+1\right)^3} - \frac{ac^6dx^3}{24\left(\sqrt{-c^2x^2+1}+1\right)^3} + \frac{bc^5dx^2}{24\left(\sqrt{-c^2x^2+1}+1\right)^2} + \frac{3\,bc^4dx\arcsin(cx)}{8\left(\sqrt{-c^2x^2+1}+1\right)} + \frac{3\,ac^4dx}{8\left(\sqrt{-c^2x^2+1}+1\right)} - \frac{5}{6}\,bc^3d\log(|c||x|) + \frac{5}{6}\,bc^3d\log\left(\sqrt{-c^2x^2+1}+1\right) + \frac{3\,bc^2d\left(\sqrt{-c^2x^2+1}+1\right)\arcsin(cx)}{8\,x} + \frac{3\,ac^2d\left(\sqrt{-c^2x^2+1}+1\right)}{8\,x} - \frac{bcd\left(\sqrt{-c^2x^2+1}+1\right)^2}{24\,x^2} - \frac{bd\left(\sqrt{-c^2x^2+1}+1\right)^3\arcsin(cx)}{24\,x^3} - \frac{ad\left(\sqrt{-c^2x^2+1}+1\right)^3}{24\,x^3}$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] -1/24*b*c^6*d*x^3*arcsin(c*x)/(sqrt(-c^2*x^2 + 1) + 1)^3 - 1/24*a*c^6*d*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + 1/24*b*c^5*d*x^2/(sqrt(-c^2*x^2 + 1) + 1)^2 +
 3/8*b*c^4*d*x*arcsin(c*x)/(sqrt(-c^2*x^2 + 1) + 1) + 3/8*a*c^4*d*x/(sqrt(-
c^2*x^2 + 1) + 1) - 5/6*b*c^3*d*log(abs(c)*abs(x)) + 5/6*b*c^3*d*log(sqrt(-
c^2*x^2 + 1) + 1) + 3/8*b*c^2*d*(sqrt(-c^2*x^2 + 1) + 1)*arcsin(c*x)/x + 3/
8*a*c^2*d*(sqrt(-c^2*x^2 + 1) + 1)/x - 1/24*b*c*d*(sqrt(-c^2*x^2 + 1) + 1)^
2/x^2 - 1/24*b*d*(sqrt(-c^2*x^2 + 1) + 1)^3*arcsin(c*x)/x^3 - 1/24*a*d*(sqr
t(-c^2*x^2 + 1) + 1)^3/x^3
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))}{x^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)}{x^4}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2))/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2))/x^4, x)
```

3.10 $\int x^4(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 186

$$\int x^4\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))\,dx = \frac{8bd^2\sqrt{1-c^2x^2}}{315c^5}+\frac{4bd^2(1-c^2x^2)^{3/2}}{945c^5}+\frac{bd^2(1-c^2x^2)^{5/2}}{525c^5} - \frac{10bd^2(1-c^2x^2)^{7/2}}{441c^5}+\frac{bd^2(1-c^2x^2)^{9/2}}{81c^5} + \frac{1}{5}d^2x^5(a+b\arcsin(cx))-\frac{2}{7}c^2d^2x^7(a+b\arcsin(cx))+\frac{1}{9}c^4d^2x^9(a+b\arcsin(cx))$$

```
[Out] 4/945*b*d^2*(-c^2*x^2+1)^(3/2)/c^5+1/525*b*d^2*(-c^2*x^2+1)^(5/2)/c^5-10/44
1*b*d^2*(-c^2*x^2+1)^(7/2)/c^5+1/81*b*d^2*(-c^2*x^2+1)^(9/2)/c^5+1/5*d^2*x^
5*(a+b*arcsin(c*x))-2/7*c^2*d^2*x^7*(a+b*arcsin(c*x))+1/9*c^4*d^2*x^9*(a+b*
arcsin(c*x))+8/315*b*d^2*(-c^2*x^2+1)^(1/2)/c^5
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {276, 4777, 12, 1265, 911, 1167}

$$\int x^4\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))\,dx = \frac{1}{9}c^4d^2x^9(a+b\arcsin(cx))-\frac{2}{7}c^2d^2x^7(a+b\arcsin(cx)) + \frac{1}{5}d^2x^5(a+b\arcsin(cx))+\frac{bd^2(1-c^2x^2)^{9/2}}{81c^5} - \frac{10bd^2(1-c^2x^2)^{7/2}}{441c^5}+\frac{bd^2(1-c^2x^2)^{5/2}}{525c^5} + \frac{4bd^2(1-c^2x^2)^{3/2}}{945c^5}+\frac{8bd^2\sqrt{1-c^2x^2}}{315c^5}$$

```
[In] Int[x^4*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*d^2*Sqrt[1 - c^2*x^2])/(315*c^5) + (4*b*d^2*(1 - c^2*x^2)^(3/2))/(945*
c^5) + (b*d^2*(1 - c^2*x^2)^(5/2))/(525*c^5) - (10*b*d^2*(1 - c^2*x^2)^(7/2
))/(441*c^5) + (b*d^2*(1 - c^2*x^2)^(9/2))/(81*c^5) + (d^2*x^5*(a + b*ArcSi
n[c*x]))/5 - (2*c^2*d^2*x^7*(a + b*ArcSin[c*x]))/7 + (c^4*d^2*x^9*(a + b*Ar
cSin[c*x]))/9
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
```

```
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{5}d^2x^5(a+b\arcsin(cx))-\frac{2}{7}c^2d^2x^7(a+b\arcsin(cx)) \\
&\quad+\frac{1}{9}c^4d^2x^9(a+b\arcsin(cx))-(bc)\int\frac{d^2x^5(63-90c^2x^2+35c^4x^4)}{315\sqrt{1-c^2x^2}}\,dx \\
&= \frac{1}{5}d^2x^5(a+b\arcsin(cx))-\frac{2}{7}c^2d^2x^7(a+b\arcsin(cx)) \\
&\quad+\frac{1}{9}c^4d^2x^9(a+b\arcsin(cx))-\frac{1}{315}\left(bcd^2\right)\int\frac{x^5(63-90c^2x^2+35c^4x^4)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{1}{5}d^2x^5(a+b\arcsin(cx))-\frac{2}{7}c^2d^2x^7(a+b\arcsin(cx))+\frac{1}{9}c^4d^2x^9(a+b\arcsin(cx)) \\
&\quad-\frac{1}{630}\left(bcd^2\right)\text{Subst}\left(\int\frac{x^2(63-90c^2x+35c^4x^2)}{\sqrt{1-c^2x}}\,dx,x,x^2\right) \\
&= \frac{1}{5}d^2x^5(a+b\arcsin(cx))-\frac{2}{7}c^2d^2x^7(a+b\arcsin(cx))+\frac{1}{9}c^4d^2x^9(a+b\arcsin(cx)) \\
&\quad+\frac{\left(bd^2\right)\text{Subst}\left(\int\left(\frac{1}{c^2}-\frac{x^2}{c^2}\right)^2\left(8+20x^2+35x^4\right)\,dx,x,\sqrt{1-c^2x^2}\right)}{315c} \\
&= \frac{1}{5}d^2x^5(a+b\arcsin(cx))-\frac{2}{7}c^2d^2x^7(a+b\arcsin(cx))+\frac{1}{9}c^4d^2x^9(a+b\arcsin(cx)) \\
&\quad+\frac{\left(bd^2\right)\text{Subst}\left(\int\left(\frac{8}{c^4}+\frac{4x^2}{c^4}+\frac{3x^4}{c^4}-\frac{50x^6}{c^4}+\frac{35x^8}{c^4}\right)\,dx,x,\sqrt{1-c^2x^2}\right)}{315c} \\
&= \frac{8bd^2\sqrt{1-c^2x^2}}{315c^5}+\frac{4bd^2\left(1-c^2x^2\right)^{3/2}}{945c^5}+\frac{bd^2\left(1-c^2x^2\right)^{5/2}}{525c^5} \\
&\quad-\frac{10bd^2\left(1-c^2x^2\right)^{7/2}}{441c^5}+\frac{bd^2\left(1-c^2x^2\right)^{9/2}}{81c^5} \\
&\quad+\frac{1}{5}d^2x^5(a+b\arcsin(cx))-\frac{2}{7}c^2d^2x^7(a+b\arcsin(cx))+\frac{1}{9}c^4d^2x^9(a+b\arcsin(cx))
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 119, normalized size of antiderivative = 0.64

$$\int x^4 (d-c^2dx^2)^2 (a+b\arcsin(cx))\,dx$$
$$= \frac{d^2\left(315ac^5x^5(63-90c^2x^2+35c^4x^4)+b\sqrt{1-c^2x^2}(2104+1052c^2x^2+789c^4x^4-2650c^6x^6+1225c^8x^8)+3\right.}{99225c^5}$$

```
[In] Integrate[x^4*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(315*a*c^5*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(2
104 + 1052*c^2*x^2 + 789*c^4*x^4 - 2650*c^6*x^6 + 1225*c^8*x^8) + 315*b*c^5
*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4)*ArcSin[c*x]))/(99225*c^5)
```

Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 168, normalized size of antiderivative = 0.90

method	result
parts	$d^2a\left(\frac{1}{9}c^4x^9-\frac{2}{7}c^2x^7+\frac{1}{5}x^5\right)+\frac{d^2b\left(\frac{\arcsin(cx)c^9x^9}{9}-\frac{2\arcsin(cx)c^7x^7}{7}+\frac{\arcsin(cx)c^5x^5}{5}+\frac{c^8x^8\sqrt{-c^2x^2+1}}{81}-\frac{106c^6x^6\sqrt{}}{39}\right.}{c^5}$
derivativedivides	$\frac{d^2a\left(\frac{1}{9}c^9x^9-\frac{2}{7}c^7x^7+\frac{1}{5}c^5x^5\right)+d^2b\left(\frac{\arcsin(cx)c^9x^9}{9}-\frac{2\arcsin(cx)c^7x^7}{7}+\frac{\arcsin(cx)c^5x^5}{5}+\frac{c^8x^8\sqrt{-c^2x^2+1}}{81}-\frac{106c^6x^6\sqrt{-c^2x^2+1}}{3969}-\right.}{c^5}$
default	$\frac{d^2a\left(\frac{1}{9}c^9x^9-\frac{2}{7}c^7x^7+\frac{1}{5}c^5x^5\right)+d^2b\left(\frac{\arcsin(cx)c^9x^9}{9}-\frac{2\arcsin(cx)c^7x^7}{7}+\frac{\arcsin(cx)c^5x^5}{5}+\frac{c^8x^8\sqrt{-c^2x^2+1}}{81}-\frac{106c^6x^6\sqrt{-c^2x^2+1}}{3969}-\right.}{c^5}$

```
[In] int(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] d^2*a*(1/9*c^4*x^9-2/7*c^2*x^7+1/5*x^5)+d^2*b/c^5*(1/9*arcsin(c*x)*c^9*x^9-
2/7*arcsin(c*x)*c^7*x^7+1/5*arcsin(c*x)*c^5*x^5+1/81*c^8*x^8*(-c^2*x^2+1)^(
1/2)-106/3969*c^6*x^6*(-c^2*x^2+1)^(1/2)+263/33075*c^4*x^4*(-c^2*x^2+1)^(1/
2)+1052/99225*c^2*x^2*(-c^2*x^2+1)^(1/2)+2104/99225*(-c^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 153, normalized size of antiderivative = 0.82

$$\int x^4 (d-c^2dx^2)^2 (a+b\arcsin(cx))\,dx$$
$$= \frac{11025\,ac^9d^2x^9-28350\,ac^7d^2x^7+19845\,ac^5d^2x^5+315\,(35\,bc^9d^2x^9-90\,bc^7d^2x^7+63\,bc^5d^2x^5)\arcsin(cx)+}{99225\,c^5}$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/99225*(11025*a*c^9*d^2*x^9 - 28350*a*c^7*d^2*x^7 + 19845*a*c^5*d^2*x^5 +
315*(35*b*c^9*d^2*x^9 - 90*b*c^7*d^2*x^7 + 63*b*c^5*d^2*x^5)*arcsin(c*x) +
(1225*b*c^8*d^2*x^8 - 2650*b*c^6*d^2*x^6 + 789*b*c^4*d^2*x^4 + 1052*b*c^2*d
^2*x^2 + 2104*b*d^2)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] (verification not implemented)

Time = 1.13 (sec) , antiderivative size = 230, normalized size of antiderivative = 1.24

$$\int x^4(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx$$
$$=\begin{cases}\frac{ac^4d^2x^9}{9}-\frac{2ac^2d^2x^7}{7}+\frac{ad^2x^5}{5}+\frac{bc^4d^2x^9\operatorname{asin}(cx)}{9}+\frac{bc^3d^2x^8\sqrt{-c^2x^2+1}}{81}-\frac{2bc^2d^2x^7\operatorname{asin}(cx)}{7}-\frac{106bcd^2x^6\sqrt{-c^2x^2+1}}{3969}+\frac{bd^2x^5\operatorname{as}}{5}\\ \frac{ad^2x^5}{5}\end{cases}$$

```
[In] integrate(x**4*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*c**4*d**2*x**9/9 - 2*a*c**2*d**2*x**7/7 + a*d**2*x**5/5 + b*c*
*4*d**2*x**9*asin(c*x)/9 + b*c**3*d**2*x**8*sqrt(-c**2*x**2 + 1)/81 - 2*b*c
**2*d**2*x**7*asin(c*x)/7 - 106*b*c*d**2*x**6*sqrt(-c**2*x**2 + 1)/3969 + b
*d**2*x**5*asin(c*x)/5 + 263*b*d**2*x**4*sqrt(-c**2*x**2 + 1)/(33075*c) + 1
052*b*d**2*x**2*sqrt(-c**2*x**2 + 1)/(99225*c**3) + 2104*b*d**2*sqrt(-c**2*
x**2 + 1)/(99225*c**5), Ne(c, 0)), (a*d**2*x**5/5, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 328 vs. $2(160) = 320$.

Time = 0.29 (sec) , antiderivative size = 328, normalized size of antiderivative = 1.76

$$\int x^4(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx=\frac{1}{9}ac^4d^2x^9-\frac{2}{7}ac^2d^2x^7$$
$$+\frac{1}{2835}\left(315\,x^9\arcsin(cx)+\left(\frac{35\sqrt{-c^2x^2+1}x^8}{c^2}+\frac{40\sqrt{-c^2x^2+1}x^6}{c^4}+\frac{48\sqrt{-c^2x^2+1}x^4}{c^6}+\frac{64\sqrt{-c^2x^2}}{c^8}\right.\right.$$
$$+\frac{1}{5}ad^2x^5$$
$$-\frac{2}{245}\left(35\,x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)\right.$$
$$+\frac{1}{75}\left(15\,x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd^2$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/9*a*c^4*d^2*x^9 - 2/7*a*c^2*d^2*x^7 + 1/2835*(315*x^9*arcsin(c*x) + (35*s
qrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^
2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^1
0)*c)*b*c^4*d^2 + 1/5*a*d^2*x^5 - 2/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*
x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/
c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^2*d^2 + 1/75*(15*x^5*arcsin(c*x) +
(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*
x^2 + 1)/c^6)*c)*b*d^2
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 284, normalized size of antiderivative = 1.53

$$\int x^4(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx = \frac{1}{9}ac^4d^2x^9 - \frac{2}{7}ac^2d^2x^7 + \frac{1}{5}ad^2x^5 + \frac{(c^2x^2-1)^4bd^2x\arcsin(cx)}{9\,c^4} + \frac{10\,(c^2x^2-1)^3bd^2x\arcsin(cx)}{63\,c^4} + \frac{(c^2x^2-1)^2bd^2x\arcsin(cx)}{105\,c^4} + \frac{(c^2x^2-1)^4\sqrt{-c^2x^2+1}bd^2}{81\,c^5} - \frac{4\,(c^2x^2-1)bd^2x\arcsin(cx)}{315\,c^4} + \frac{10\,(c^2x^2-1)^3\sqrt{-c^2x^2+1}bd^2}{441\,c^5} + \frac{8\,bd^2x\arcsin(cx)}{315\,c^4} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}bd^2}{525\,c^5} + \frac{4\,(-c^2x^2+1)^{\frac{3}{2}}bd^2}{945\,c^5} + \frac{8\,\sqrt{-c^2x^2+1}bd^2}{315\,c^5}$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/9*a*c^4*d^2*x^9 - 2/7*a*c^2*d^2*x^7 + 1/5*a*d^2*x^5 + 1/9*(c^2*x^2 - 1)^4
*b*d^2*x*arcsin(c*x)/c^4 + 10/63*(c^2*x^2 - 1)^3*b*d^2*x*arcsin(c*x)/c^4 +
1/105*(c^2*x^2 - 1)^2*b*d^2*x*arcsin(c*x)/c^4 + 1/81*(c^2*x^2 - 1)^4*sqrt(-
c^2*x^2 + 1)*b*d^2/c^5 - 4/315*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*x)/c^4 + 10/4
41*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d^2/c^5 + 8/315*b*d^2*x*arcsin(c*x)
/c^4 + 1/525*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2/c^5 + 4/945*(-c^2*x^2
 + 1)^(3/2)*b*d^2/c^5 + 8/315*sqrt(-c^2*x^2 + 1)*b*d^2/c^5
```

Mupad [F(-1)]

Timed out.

$$\int x^4 (d - c^2 d x^2)^2 (a + b \arcsin(cx)) \, dx = \int x^4 \left(a + b \operatorname{asin}(c\,x)\right) \left(d - c^2\,d\,x^2\right)^2 \, dx$$

```
[In] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^2,x)
[Out] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^2, x)
```

3.11 $\int x^3(d-c^2dx^2)^2 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 184

$$\int x^3(d-c^2dx^2)^2 (a+b\arcsin(cx))\,dx = \frac{73bd^2x\sqrt{1-c^2x^2}}{3072c^3}+\frac{73bd^2x^3\sqrt{1-c^2x^2}}{4608c} - \frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152}+\frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2} - \frac{73bd^2\arcsin(cx)}{3072c^4}+\frac{1}{4}d^2x^4(a+b\arcsin(cx)) - \frac{1}{3}c^2d^2x^6(a+b\arcsin(cx)) + \frac{1}{8}c^4d^2x^8(a+b\arcsin(cx))$$

```
[Out] -73/3072*b*d^2*arcsin(c*x)/c^4+1/4*d^2*x^4*(a+b*arcsin(c*x))-1/3*c^2*d^2*x^
6*(a+b*arcsin(c*x))+1/8*c^4*d^2*x^8*(a+b*arcsin(c*x))+73/3072*b*d^2*x*(-c^2
*x^2+1)^(1/2)/c^3+73/4608*b*d^2*x^3*(-c^2*x^2+1)^(1/2)/c-43/1152*b*c*d^2*x^
5*(-c^2*x^2+1)^(1/2)+1/64*b*c^3*d^2*x^7*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used

= {272, 45, 4777, 12, 1281, 470, 327, 222}

$$\int x^3 \left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))\,dx = \frac{1}{8}c^4d^2x^8(a+b\arcsin(cx))-\frac{1}{3}c^2d^2x^6(a+b\arcsin(cx)) + \frac{1}{4}d^2x^4(a+b\arcsin(cx)) - \frac{73bd^2\arcsin(cx)}{3072c^4} - \frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152} + \frac{73bd^2x^3\sqrt{1-c^2x^2}}{4608c} + \frac{73bd^2x\sqrt{1-c^2x^2}}{3072c^3} + \frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2}$$

```
[In] Int[x^3*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (73*b*d^2*x*Sqrt[1 - c^2*x^2])/(3072*c^3) + (73*b*d^2*x^3*Sqrt[1 - c^2*x^2]
)/(4608*c) - (43*b*c*d^2*x^5*Sqrt[1 - c^2*x^2])/1152 + (b*c^3*d^2*x^7*Sqrt[
1 - c^2*x^2])/64 - (73*b*d^2*ArcSin[c*x])/(3072*c^4) + (d^2*x^4*(a + b*ArcS
in[c*x]))/4 - (c^2*d^2*x^6*(a + b*ArcSin[c*x]))/3 + (c^4*d^2*x^8*(a + b*Arc
Sin[c*x]))/8
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
```

```
x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{4}d^2x^4(a+b\arcsin(cx)) - \frac{1}{3}c^2d^2x^6(a+b\arcsin(cx)) \\
&\quad + \frac{1}{8}c^4d^2x^8(a+b\arcsin(cx)) - (bc)\int \frac{d^2x^4(6-8c^2x^2+3c^4x^4)}{24\sqrt{1-c^2x^2}}\,dx \\
&= \frac{1}{4}d^2x^4(a+b\arcsin(cx)) - \frac{1}{3}c^2d^2x^6(a+b\arcsin(cx)) \\
&\quad + \frac{1}{8}c^4d^2x^8(a+b\arcsin(cx)) - \frac{1}{24}(bcd^2)\int \frac{x^4(6-8c^2x^2+3c^4x^4)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2} + \frac{1}{4}d^2x^4(a+b\arcsin(cx)) - \frac{1}{3}c^2d^2x^6(a+b\arcsin(cx)) \\
&\quad + \frac{1}{8}c^4d^2x^8(a+b\arcsin(cx)) + \frac{(bd^2)\int \frac{x^4(-48c^2+43c^4x^2)}{\sqrt{1-c^2x^2}}\,dx}{192c}
\end{aligned}$$

$$= -\frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152} + \frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2} + \frac{1}{4}d^2x^4(a+b\arcsin(cx)) - \frac{1}{3}c^2d^2x^6(a+b\arcsin(cx)) + \frac{1}{8}c^4d^2x^8(a+b\arcsin(cx)) - \frac{(73bcd^2)\int\frac{x^4}{\sqrt{1-c^2x^2}}dx}{1152}$$

$$= \frac{73bd^2x^3\sqrt{1-c^2x^2}}{4608c} - \frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152} + \frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2} + \frac{1}{4}d^2x^4(a+b\arcsin(cx)) - \frac{1}{3}c^2d^2x^6(a+b\arcsin(cx)) + \frac{1}{8}c^4d^2x^8(a+b\arcsin(cx)) - \frac{(73bd^2)\int\frac{x^2}{\sqrt{1-c^2x^2}}dx}{1536c}$$

$$= \frac{73bd^2x\sqrt{1-c^2x^2}}{3072c^3} + \frac{73bd^2x^3\sqrt{1-c^2x^2}}{4608c} - \frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152} + \frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2} + \frac{1}{4}d^2x^4(a+b\arcsin(cx)) - \frac{1}{3}c^2d^2x^6(a+b\arcsin(cx)) + \frac{1}{8}c^4d^2x^8(a+b\arcsin(cx)) - \frac{(73bd^2)\int\frac{1}{\sqrt{1-c^2x^2}}dx}{3072c^3}$$

$$= \frac{73bd^2x\sqrt{1-c^2x^2}}{3072c^3} + \frac{73bd^2x^3\sqrt{1-c^2x^2}}{4608c} - \frac{43bcd^2x^5\sqrt{1-c^2x^2}}{1152} + \frac{1}{64}bc^3d^2x^7\sqrt{1-c^2x^2} - \frac{73bd^2\arcsin(cx)}{3072c^4} + \frac{1}{4}d^2x^4(a+b\arcsin(cx)) - \frac{1}{3}c^2d^2x^6(a+b\arcsin(cx)) + \frac{1}{8}c^4d^2x^8(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.62

$$\int x^3(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx = \frac{d^2(384ac^4x^4(6-8c^2x^2+3c^4x^4)+bcx\sqrt{1-c^2x^2}(219+146c^2x^2-344c^4x^4+144c^6x^6)+3b(-73+768c^4}{9216c^4}$$

```
[In] Integrate[x^3*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(384*a*c^4*x^4*(6 - 8*c^2*x^2 + 3*c^4*x^4) + b*c*x*Sqrt[1 - c^2*x^2]*(
219 + 146*c^2*x^2 - 344*c^4*x^4 + 144*c^6*x^6) + 3*b*(-73 + 768*c^4*x^4 - 1
024*c^6*x^6 + 384*c^8*x^8)*ArcSin[c*x]))/(9216*c^4)
```

Maple [A] (verified)

Time = 0.07 (sec) , antiderivative size = 156, normalized size of antiderivative = 0.85

method	result
parts	$d^2a\left(\frac{1}{8}c^4x^8-\frac{1}{3}c^2x^6+\frac{1}{4}x^4\right)+\frac{d^2b\left(\frac{\arcsin(cx)c^8x^8}{8}-\frac{\arcsin(cx)c^6x^6}{3}+\frac{c^4x^4\arcsin(cx)}{4}+\frac{c^7x^7\sqrt{-c^2x^2+1}}{64}-\frac{43c^5x^5\sqrt{-}}{1152}\right.}{c^4}$
derivativedivides	$\frac{d^2a\left(\frac{1}{8}c^8x^8-\frac{1}{3}c^6x^6+\frac{1}{4}c^4x^4\right)+d^2b\left(\frac{\arcsin(cx)c^8x^8}{8}-\frac{\arcsin(cx)c^6x^6}{3}+\frac{c^4x^4\arcsin(cx)}{4}+\frac{c^7x^7\sqrt{-c^2x^2+1}}{64}-\frac{43c^5x^5\sqrt{-c^2x^2+1}}{1152}+\right.}{c^4}$
default	$\frac{d^2a\left(\frac{1}{8}c^8x^8-\frac{1}{3}c^6x^6+\frac{1}{4}c^4x^4\right)+d^2b\left(\frac{\arcsin(cx)c^8x^8}{8}-\frac{\arcsin(cx)c^6x^6}{3}+\frac{c^4x^4\arcsin(cx)}{4}+\frac{c^7x^7\sqrt{-c^2x^2+1}}{64}-\frac{43c^5x^5\sqrt{-c^2x^2+1}}{1152}+\right.}{c^4}$

```
[In] int(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] d^2*a*(1/8*c^4*x^8-1/3*c^2*x^6+1/4*x^4)+d^2*b/c^4*(1/8*arcsin(c*x)*c^8*x^8-
1/3*arcsin(c*x)*c^6*x^6+1/4*c^4*x^4*arcsin(c*x)+1/64*c^7*x^7*(-c^2*x^2+1)^(
1/2)-43/1152*c^5*x^5*(-c^2*x^2+1)^(1/2)+73/4608*c^3*x^3*(-c^2*x^2+1)^(1/2)+
73/3072*c*x*(-c^2*x^2+1)^(1/2)-73/3072*arcsin(c*x))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.81

$$\int x^3\left(d-c^2dx^2\right)^2\left(a+b\arcsin(cx)\right)dx$$
$$=\frac{1152\,ac^8d^2x^8-3072\,ac^6d^2x^6+2304\,ac^4d^2x^4+3\left(384\,bc^8d^2x^8-1024\,bc^6d^2x^6+768\,bc^4d^2x^4-73\,bd^2\right)\operatorname{arcsin}}{9216\,c^4}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/9216*(1152*a*c^8*d^2*x^8 - 3072*a*c^6*d^2*x^6 + 2304*a*c^4*d^2*x^4 + 3*(3
84*b*c^8*d^2*x^8 - 1024*b*c^6*d^2*x^6 + 768*b*c^4*d^2*x^4 - 73*b*d^2)*arcsi
n(c*x) + (144*b*c^7*d^2*x^7 - 344*b*c^5*d^2*x^5 + 146*b*c^3*d^2*x^3 + 219*b
*c*d^2*x)*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [A] (verification not implemented)

Time = 0.85 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.18

$$\int x^3(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx$$
$$=\begin{cases}\frac{ac^4d^2x^8}{8}-\frac{ac^2d^2x^6}{3}+\frac{ad^2x^4}{4}+\frac{bc^4d^2x^8\operatorname{asin}(cx)}{8}+\frac{bc^3d^2x^7\sqrt{-c^2x^2+1}}{64}-\frac{bc^2d^2x^6\operatorname{asin}(cx)}{3}-\frac{43bcd^2x^5\sqrt{-c^2x^2+1}}{1152}+\frac{bd^2x^4\operatorname{asin}(c\\ \frac{ad^2x^4}{4}\end{cases}$$

```
[In] integrate(x**3*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*c**4*d**2*x**8/8 - a*c**2*d**2*x**6/3 + a*d**2*x**4/4 + b*c**4
*d**2*x**8*asin(c*x)/8 + b*c**3*d**2*x**7*sqrt(-c**2*x**2 + 1)/64 - b*c**2*
d**2*x**6*asin(c*x)/3 - 43*b*c*d**2*x**5*sqrt(-c**2*x**2 + 1)/1152 + b*d**2
*x**4*asin(c*x)/4 + 73*b*d**2*x**3*sqrt(-c**2*x**2 + 1)/(4608*c) + 73*b*d**
2*x*sqrt(-c**2*x**2 + 1)/(3072*c**3) - 73*b*d**2*asin(c*x)/(3072*c**4), Ne(
c, 0)), (a*d**2*x**4/4, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 298, normalized size of antiderivative = 1.62

$$\int x^3(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx=\frac{1}{8}ac^4d^2x^8-\frac{1}{3}ac^2d^2x^6$$
$$+\frac{1}{3072}\left(384\,x^8\arcsin(cx)+\left(\frac{48\sqrt{-c^2x^2+1}x^7}{c^2}+\frac{56\sqrt{-c^2x^2+1}x^5}{c^4}+\frac{70\sqrt{-c^2x^2+1}x^3}{c^6}+\frac{105\sqrt{-c^2x}}{c^8}\right.\right.$$
$$+\frac{1}{4}ad^2x^4$$
$$-\frac{1}{144}\left(48\,x^6\arcsin(cx)+\left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2}+\frac{10\sqrt{-c^2x^2+1}x^3}{c^4}+\frac{15\sqrt{-c^2x^2+1}x}{c^6}-\frac{15\arcsin(cx)}{c^7}\right)\right.$$
$$+\frac{1}{32}\left(8\,x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\arcsin(cx)}{c^5}\right)c\right)bd^2$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/8*a*c^4*d^2*x^8 - 1/3*a*c^2*d^2*x^6 + 1/3072*(384*x^8*arcsin(c*x) + (48*s
qrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x^
2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c*x)/c^9)*c)*b*c
^4*d^2 + 1/4*a*d^2*x^4 - 1/144*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*
x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*
arcsin(c*x)/c^7)*c)*b*c^2*d^2 + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2
+ 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d^2
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.11

$$\int x^3 (d - c^2 d x^2)^2 (a + b \arcsin(cx)) \, dx = \frac{1}{8} a c^4 d^2 x^8 - \frac{1}{3} a c^2 d^2 x^6 + \frac{1}{4} a d^2 x^4 + \frac{(c^2x^2 - 1)^3 \sqrt{-c^2x^2 + 1} b d^2 x}{64 c^3} + \frac{(c^2x^2 - 1)^4 b d^2 \arcsin(cx)}{8 c^4} + \frac{11 (c^2x^2 - 1)^2 \sqrt{-c^2x^2 + 1} b d^2 x}{1152 c^3} + \frac{(c^2x^2 - 1)^3 b d^2 \arcsin(cx)}{6 c^4} + \frac{55 (-c^2x^2 + 1)^{\frac{3}{2}} b d^2 x}{4608 c^3} + \frac{55 \sqrt{-c^2x^2 + 1} b d^2 x}{3072 c^3} + \frac{55 b d^2 \arcsin(cx)}{3072 c^4}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/8*a*c^4*d^2*x^8 - 1/3*a*c^2*d^2*x^6 + 1/4*a*d^2*x^4 + 1/64*(c^2*x^2 - 1)^
3*sqrt(-c^2*x^2 + 1)*b*d^2*x/c^3 + 1/8*(c^2*x^2 - 1)^4*b*d^2*arcsin(c*x)/c^
4 + 11/1152*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2*x/c^3 + 1/6*(c^2*x^2 -
 1)^3*b*d^2*arcsin(c*x)/c^4 + 55/4608*(-c^2*x^2 + 1)^(3/2)*b*d^2*x/c^3 + 55
/3072*sqrt(-c^2*x^2 + 1)*b*d^2*x/c^3 + 55/3072*b*d^2*arcsin(c*x)/c^4
```

Mupad [F(-1)]

Timed out.

$$\int x^3 (d - c^2 d x^2)^2 (a + b \arcsin(cx)) \, dx = \int x^3 (a + b \operatorname{asin}(c x)) \left(d - c^2 d x^2\right)^2 \, dx$$

```
[In] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^2,x)
```

```
[Out] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^2, x)
```

3.12 $\int x^2(d-c^2dx^2)^2 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 161

$$\int x^2\left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))\,dx = \frac{8bd^2\sqrt{1-c^2x^2}}{105c^3}+\frac{4bd^2(1-c^2x^2)^{3/2}}{315c^3}+\frac{bd^2(1-c^2x^2)^{5/2}}{175c^3}-\frac{bd^2(1-c^2x^2)^{7/2}}{49c^3}+\frac{1}{3}d^2x^3(a+b\arcsin(cx))-\frac{2}{5}c^2d^2x^5(a+b\arcsin(cx))+\frac{1}{7}c^4d^2x^7(a+b\arcsin(cx))$$

```
[Out] 4/315*b*d^2*(-c^2*x^2+1)^(3/2)/c^3+1/175*b*d^2*(-c^2*x^2+1)^(5/2)/c^3-1/49*
b*d^2*(-c^2*x^2+1)^(7/2)/c^3+1/3*d^2*x^3*(a+b*arcsin(c*x))-2/5*c^2*d^2*x^5*
(a+b*arcsin(c*x))+1/7*c^4*d^2*x^7*(a+b*arcsin(c*x))+8/105*b*d^2*(-c^2*x^2+1
)^(1/2)/c^3
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {276, 4777, 12, 1265, 785}

$$\int x^2\left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))\,dx = \frac{1}{7}c^4d^2x^7(a+b\arcsin(cx))-\frac{2}{5}c^2d^2x^5(a+b\arcsin(cx))+\frac{1}{3}d^2x^3(a+b\arcsin(cx))-\frac{bd^2(1-c^2x^2)^{7/2}}{49c^3}+\frac{bd^2(1-c^2x^2)^{5/2}}{175c^3}+\frac{4bd^2(1-c^2x^2)^{3/2}}{315c^3}+\frac{8bd^2\sqrt{1-c^2x^2}}{105c^3}$$

```
[In] Int[x^2*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*d^2*Sqrt[1 - c^2*x^2])/(105*c^3) + (4*b*d^2*(1 - c^2*x^2)^(3/2))/(315*
c^3) + (b*d^2*(1 - c^2*x^2)^(5/2))/(175*c^3) - (b*d^2*(1 - c^2*x^2)^(7/2))/
(49*c^3) + (d^2*x^3*(a + b*ArcSin[c*x]))/3 - (2*c^2*d^2*x^5*(a + b*ArcSin[c
*x]))/5 + (c^4*d^2*x^7*(a + b*ArcSin[c*x]))/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 785

```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (
c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g*x)*
(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && NeQ[b^
2 - 4*a*c, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0] && IntegerQ[m]))
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{1}{3}d^2x^3(a+b\arcsin(cx)) - \frac{2}{5}c^2d^2x^5(a+b\arcsin(cx)) \\ &\quad + \frac{1}{7}c^4d^2x^7(a+b\arcsin(cx)) - (bc)\int \frac{d^2x^3(35-42c^2x^2+15c^4x^4)}{105\sqrt{1-c^2x^2}}\,dx\end{aligned}$$

$$= \frac{1}{3}d^2x^3(a+b\arcsin(cx)) - \frac{2}{5}c^2d^2x^5(a+b\arcsin(cx)) + \frac{1}{7}c^4d^2x^7(a+b\arcsin(cx)) - \frac{1}{105}(bcd^2)\int \frac{x^3(35-42c^2x^2+15c^4x^4)}{\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{1}{3}d^2x^3(a+b\arcsin(cx)) - \frac{2}{5}c^2d^2x^5(a+b\arcsin(cx)) + \frac{1}{7}c^4d^2x^7(a+b\arcsin(cx)) - \frac{1}{210}(bcd^2)\,\text{Subst}\left(\int \frac{x(35-42c^2x+15c^4x^2)}{\sqrt{1-c^2x}}\,dx, x, x^2\right)$$

$$= \frac{1}{3}d^2x^3(a+b\arcsin(cx)) - \frac{2}{5}c^2d^2x^5(a+b\arcsin(cx)) + \frac{1}{7}c^4d^2x^7(a+b\arcsin(cx)) - \frac{1}{210}(bcd^2)\,\text{Subst}\left(\int \left(\frac{8}{c^2\sqrt{1-c^2x}} + \frac{4\sqrt{1-c^2x}}{c^2} + \frac{3(1-c^2x)^{3/2}}{c^2} - \frac{15(1-c^2x)^{5/2}}{c^2}\right) dx, x, x^2\right)$$

$$= \frac{8bd^2\sqrt{1-c^2x^2}}{105c^3} + \frac{4bd^2(1-c^2x^2)^{3/2}}{315c^3} + \frac{bd^2(1-c^2x^2)^{5/2}}{175c^3} - \frac{bd^2(1-c^2x^2)^{7/2}}{49c^3} + \frac{1}{3}d^2x^3(a+b\arcsin(cx)) - \frac{2}{5}c^2d^2x^5(a+b\arcsin(cx)) + \frac{1}{7}c^4d^2x^7(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.69

$$\int x^2(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx = \frac{d^2(105ac^3x^3(35-42c^2x^2+15c^4x^4) + b\sqrt{1-c^2x^2}(818+409c^2x^2-612c^4x^4+225c^6x^6) + 105bc^3x^3(35-}{11025c^3}$$

```
[In] Integrate[x^2*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(105*a*c^3*x^3*(35 - 42*c^2*x^2 + 15*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(8
18 + 409*c^2*x^2 - 612*c^4*x^4 + 225*c^6*x^6) + 105*b*c^3*x^3*(35 - 42*c^2*
x^2 + 15*c^4*x^4)*ArcSin[c*x]))/(11025*c^3)
```

Maple [A] (verified)

Time = 0.07 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.92

method	result
parts	$d^2 a\left(\frac{1}{7}c^4x^7-\frac{2}{5}c^2x^5+\frac{1}{3}x^3\right)+\frac{d^2b\left(\frac{\arcsin(cx)c^7x^7}{7}-\frac{2\arcsin(cx)c^5x^5}{5}+\frac{c^3x^3\arcsin(cx)}{3}+\frac{c^6x^6\sqrt{-c^2x^2+1}}{49}-\frac{68c^4x^4\sqrt{}}{12}\right.}{c^3}$
derivativedivides	$\frac{d^2a\left(\frac{1}{7}c^7x^7-\frac{2}{5}c^5x^5+\frac{1}{3}c^3x^3\right)+d^2b\left(\frac{\arcsin(cx)c^7x^7}{7}-\frac{2\arcsin(cx)c^5x^5}{5}+\frac{c^3x^3\arcsin(cx)}{3}+\frac{c^6x^6\sqrt{-c^2x^2+1}}{49}-\frac{68c^4x^4\sqrt{-c^2x^2+1}}{1225}+\right.}{c^3}$
default	$\frac{d^2a\left(\frac{1}{7}c^7x^7-\frac{2}{5}c^5x^5+\frac{1}{3}c^3x^3\right)+d^2b\left(\frac{\arcsin(cx)c^7x^7}{7}-\frac{2\arcsin(cx)c^5x^5}{5}+\frac{c^3x^3\arcsin(cx)}{3}+\frac{c^6x^6\sqrt{-c^2x^2+1}}{49}-\frac{68c^4x^4\sqrt{-c^2x^2+1}}{1225}+\right.}{c^3}$

```
[In] int(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] d^2*a*(1/7*c^4*x^7-2/5*c^2*x^5+1/3*x^3)+d^2*b/c^3*(1/7*arcsin(c*x)*c^7*x^7-
2/5*arcsin(c*x)*c^5*x^5+1/3*c^3*x^3*arcsin(c*x)+1/49*c^6*x^6*(-c^2*x^2+1)^(
1/2)-68/1225*c^4*x^4*(-c^2*x^2+1)^(1/2)+409/11025*c^2*x^2*(-c^2*x^2+1)^(1/2
)+818/11025*(-c^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 141, normalized size of antiderivative = 0.88

$$\int x^2\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))\,dx$$
$$=\frac{1575\,ac^7d^2x^7-4410\,ac^5d^2x^5+3675\,ac^3d^2x^3+105\left(15\,bc^7d^2x^7-42\,bc^5d^2x^5+35\,bc^3d^2x^3\right)\arcsin(cx)+(22}{11025\,c^3}$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/11025*(1575*a*c^7*d^2*x^7 - 4410*a*c^5*d^2*x^5 + 3675*a*c^3*d^2*x^3 + 105
*(15*b*c^7*d^2*x^7 - 42*b*c^5*d^2*x^5 + 35*b*c^3*d^2*x^3)*arcsin(c*x) + (22
5*b*c^6*d^2*x^6 - 612*b*c^4*d^2*x^4 + 409*b*c^2*d^2*x^2 + 818*b*d^2)*sqrt(-
c^2*x^2 + 1))/c^3
```

Sympy [A] (verification not implemented)

Time = 0.61 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.25

$$\int x^2\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))\,dx$$
$$=\begin{cases}\frac{ac^4d^2x^7}{7}-\frac{2ac^2d^2x^5}{5}+\frac{ad^2x^3}{3}+\frac{bc^4d^2x^7\operatorname{asin}(cx)}{7}+\frac{bc^3d^2x^6\sqrt{-c^2x^2+1}}{49}-\frac{2bc^2d^2x^5\operatorname{asin}(cx)}{5}-\frac{68bcd^2x^4\sqrt{-c^2x^2+1}}{1225}+\frac{bd^2x^3\operatorname{asin}}{3}\\ \frac{ad^2x^3}{3}\end{cases}$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*c**4*d**2*x**7/7 - 2*a*c**2*d**2*x**5/5 + a*d**2*x**3/3 + b*c*
*4*d**2*x**7*asin(c*x)/7 + b*c**3*d**2*x**6*sqrt(-c**2*x**2 + 1)/49 - 2*b*c
**2*d**2*x**5*asin(c*x)/5 - 68*b*c*d**2*x**4*sqrt(-c**2*x**2 + 1)/1225 + b*
d**2*x**3*asin(c*x)/3 + 409*b*d**2*x**2*sqrt(-c**2*x**2 + 1)/(11025*c) + 81
8*b*d**2*sqrt(-c**2*x**2 + 1)/(11025*c**3), Ne(c, 0)), (a*d**2*x**3/3, True
))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 267, normalized size of antiderivative = 1.66

$$\int x^2\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))\,dx=\frac{1}{7}\,ac^4d^2x^7-\frac{2}{5}\,ac^2d^2x^5$$
$$+\frac{1}{245}\left(35\,x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)\right.$$
$$\left.-\frac{2}{75}\left(15\,x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bc^2d^2\right.$$
$$+\frac{1}{3}\,ad^2x^3+\frac{1}{9}\left(3\,x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/7*a*c^4*d^2*x^7 - 2/5*a*c^2*d^2*x^5 + 1/245*(35*x^7*arcsin(c*x) + (5*sqrt
(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1
)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^4*d^2 - 2/75*(15*x^5*arcsin(c
*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt
(-c^2*x^2 + 1)/c^6)*c)*b*c^2*d^2 + 1/3*a*d^2*x^3 + 1/9*(3*x^3*arcsin(c*x) +
 c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^2
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.41

$$\int x^2\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))\,dx = \frac{1}{7}\,ac^4d^2x^7-\frac{2}{5}\,ac^2d^2x^5+\frac{1}{3}\,ad^2x^3 + \frac{\left(c^2x^2-1\right)^3bd^2x\arcsin\left(cx\right)}{7\,c^2} + \frac{\left(c^2x^2-1\right)^2bd^2x\arcsin\left(cx\right)}{35\,c^2} - \frac{4\left(c^2x^2-1\right)bd^2x\arcsin\left(cx\right)}{105\,c^2} + \frac{\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}bd^2}{49\,c^3} + \frac{8\,bd^2x\arcsin\left(cx\right)}{105\,c^2} + \frac{\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}bd^2}{175\,c^3} + \frac{4\left(-c^2x^2+1\right)^{\frac{3}{2}}bd^2}{315\,c^3} + \frac{8\sqrt{-c^2x^2+1}bd^2}{105\,c^3}$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/7*a*c^4*d^2*x^7 - 2/5*a*c^2*d^2*x^5 + 1/3*a*d^2*x^3 + 1/7*(c^2*x^2 - 1)^3
*b*d^2*x*arcsin(c*x)/c^2 + 1/35*(c^2*x^2 - 1)^2*b*d^2*x*arcsin(c*x)/c^2 - 4
/105*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*x)/c^2 + 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2
*x^2 + 1)*b*d^2/c^3 + 8/105*b*d^2*x*arcsin(c*x)/c^2 + 1/175*(c^2*x^2 - 1)^2
*sqrt(-c^2*x^2 + 1)*b*d^2/c^3 + 4/315*(-c^2*x^2 + 1)^(3/2)*b*d^2/c^3 + 8/10
5*sqrt(-c^2*x^2 + 1)*b*d^2/c^3
```

Mupad [F(-1)]

Timed out.

$$\int x^2\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))\,dx=\int x^2\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\left(d-c^2\,d\,x^2\right)^2\,dx$$

```
[In] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^2,x)
```

```
[Out] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^2, x)
```

3.13 $\int x(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 124

$$\int x(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx=\frac{5bd^2x\sqrt{1-c^2x^2}}{96c}+\frac{5bd^2x(1-c^2x^2)^{3/2}}{144c}+\frac{bd^2x(1-c^2x^2)^{5/2}}{36c}+\frac{5bd^2\arcsin(cx)}{96c^2}-\frac{d^2(1-c^2x^2)^3(a+b\arcsin(cx))}{6c^2}$$

```
[Out] 5/144*b*d^2*x*(-c^2*x^2+1)^(3/2)/c+1/36*b*d^2*x*(-c^2*x^2+1)^(5/2)/c+5/96*b
*d^2*arcsin(c*x)/c^2-1/6*d^2*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))/c^2+5/96*b*d^
2*x*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {4767, 201, 222}

$$\int x(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx=-\frac{d^2(1-c^2x^2)^3(a+b\arcsin(cx))}{6c^2}+\frac{5bd^2\arcsin(cx)}{96c^2}+\frac{bd^2x(1-c^2x^2)^{5/2}}{36c}+\frac{5bd^2x(1-c^2x^2)^{3/2}}{144c}+\frac{5bd^2x\sqrt{1-c^2x^2}}{96c}$$

```
[In] Int[x*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (5*b*d^2*x*Sqrt[1 - c^2*x^2])/(96*c) + (5*b*d^2*x*(1 - c^2*x^2)^(3/2))/(144
*c) + (b*d^2*x*(1 - c^2*x^2)^(5/2))/(36*c) + (5*b*d^2*ArcSin[c*x])/(96*c^2)
 - (d^2*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(6*c^2)
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^2(1-c^2x^2)^3\,(a+b\arcsin(cx))}{6c^2}+\frac{(bd^2)\int (1-c^2x^2)^{5/2}\,dx}{6c}\\
&= \frac{bd^2x(1-c^2x^2)^{5/2}}{36c}-\frac{d^2(1-c^2x^2)^3\,(a+b\arcsin(cx))}{6c^2}+\frac{(5bd^2)\int (1-c^2x^2)^{3/2}\,dx}{36c}\\
&= \frac{5bd^2x(1-c^2x^2)^{3/2}}{144c}+\frac{bd^2x(1-c^2x^2)^{5/2}}{36c}\\
&\quad -\frac{d^2(1-c^2x^2)^3\,(a+b\arcsin(cx))}{6c^2}+\frac{(5bd^2)\int \sqrt{1-c^2x^2}\,dx}{48c}\\
&= \frac{5bd^2x\sqrt{1-c^2x^2}}{96c}+\frac{5bd^2x(1-c^2x^2)^{3/2}}{144c}+\frac{bd^2x(1-c^2x^2)^{5/2}}{36c}\\
&\quad -\frac{d^2(1-c^2x^2)^3\,(a+b\arcsin(cx))}{6c^2}+\frac{(5bd^2)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{96c}\\
&= \frac{5bd^2x\sqrt{1-c^2x^2}}{96c}+\frac{5bd^2x(1-c^2x^2)^{3/2}}{144c}+\frac{bd^2x(1-c^2x^2)^{5/2}}{36c}\\
&\quad +\frac{5bd^2\arcsin(cx)}{96c^2}-\frac{d^2(1-c^2x^2)^3\,(a+b\arcsin(cx))}{6c^2}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.76

$$\int x(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx$$
$$=\frac{d^2\left(48a(-1+c^2x^2)^3+bcx\sqrt{1-c^2x^2}(33-26c^2x^2+8c^4x^4)+3b(-11+48c^2x^2-48c^4x^4+16c^6x^6)\arcsin\right.}{288c^2}$$

```
[In] Integrate[x*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*(48*a*(-1 + c^2*x^2)^3 + b*c*x*Sqrt[1 - c^2*x^2]*(33 - 26*c^2*x^2 + 8*
c^4*x^4) + 3*b*(-11 + 48*c^2*x^2 - 48*c^4*x^4 + 16*c^6*x^6)*ArcSin[c*x]))/(
288*c^2)
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 127, normalized size of antiderivative = 1.02

method	result
derivativedivides	$\frac{\frac{d^2a(c^2x^2-1)^3}{6}+d^2b\left(\frac{\arcsin(cx)c^6x^6}{6}-\frac{c^4x^4\arcsin(cx)}{2}+\frac{c^2x^2\arcsin(cx)}{2}-\frac{11\arcsin(cx)}{96}+\frac{c^5x^5\sqrt{-c^2x^2+1}}{36}-\frac{13c^3x^3\sqrt{-c^2x^2+1}}{144}\right.}{c^2}$
default	$\frac{\frac{d^2a(c^2x^2-1)^3}{6}+d^2b\left(\frac{\arcsin(cx)c^6x^6}{6}-\frac{c^4x^4\arcsin(cx)}{2}+\frac{c^2x^2\arcsin(cx)}{2}-\frac{11\arcsin(cx)}{96}+\frac{c^5x^5\sqrt{-c^2x^2+1}}{36}-\frac{13c^3x^3\sqrt{-c^2x^2+1}}{144}\right.}{c^2}$
parts	$\frac{d^2a(c^2x^2-1)^3}{6c^2}+\frac{d^2b\left(\frac{\arcsin(cx)c^6x^6}{6}-\frac{c^4x^4\arcsin(cx)}{2}+\frac{c^2x^2\arcsin(cx)}{2}-\frac{11\arcsin(cx)}{96}+\frac{c^5x^5\sqrt{-c^2x^2+1}}{36}-\frac{13c^3x^3\sqrt{-c^2x^2}}{144}\right.}{c^2}$

```
[In] int(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(1/6*d^2*a*(c^2*x^2-1)^3+d^2*b*(1/6*arcsin(c*x)*c^6*x^6-1/2*c^4*x^4*a
rcsin(c*x)+1/2*c^2*x^2*arcsin(c*x)-11/96*arcsin(c*x)+1/36*c^5*x^5*(-c^2*x^2
+1)^(1/2)-13/144*c^3*x^3*(-c^2*x^2+1)^(1/2)+11/96*c*x*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.10

$$\int x(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx$$
$$=\frac{48\,ac^6d^2x^6-144\,ac^4d^2x^4+144\,ac^2d^2x^2+3\,(16\,bc^6d^2x^6-48\,bc^4d^2x^4+48\,bc^2d^2x^2-11\,bd^2)\arcsin(cx)+}{288\,c^2}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/288*(48*a*c^6*d^2*x^6 - 144*a*c^4*d^2*x^4 + 144*a*c^2*d^2*x^2 + 3*(16*b*c
^6*d^2*x^6 - 48*b*c^4*d^2*x^4 + 48*b*c^2*d^2*x^2 - 11*b*d^2)*arcsin(c*x) +
(8*b*c^5*d^2*x^5 - 26*b*c^3*d^2*x^3 + 33*b*c*d^2*x)*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [A] (verification not implemented)

Time = 0.49 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.53

$$\int x(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx$$
$$=\begin{cases} \frac{ac^4d^2x^6}{6}-\frac{ac^2d^2x^4}{2}+\frac{ad^2x^2}{2}+\frac{bc^4d^2x^6\operatorname{asin}(cx)}{6}+\frac{bc^3d^2x^5\sqrt{-c^2x^2+1}}{36}-\frac{bc^2d^2x^4\operatorname{asin}(cx)}{2}-\frac{13bcd^2x^3\sqrt{-c^2x^2+1}}{144}+\frac{bd^2x^2\operatorname{asin}(cx}{2} \\ \frac{ad^2x^2}{2} \end{cases}$$

```
[In] integrate(x*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*c**4*d**2*x**6/6 - a*c**2*d**2*x**4/2 + a*d**2*x**2/2 + b*c**4
*d**2*x**6*asin(c*x)/6 + b*c**3*d**2*x**5*sqrt(-c**2*x**2 + 1)/36 - b*c**2*
d**2*x**4*asin(c*x)/2 - 13*b*c*d**2*x**3*sqrt(-c**2*x**2 + 1)/144 + b*d**2*
x**2*asin(c*x)/2 + 11*b*d**2*x*sqrt(-c**2*x**2 + 1)/(96*c) - 11*b*d**2*asin
(c*x)/(96*c**2), Ne(c, 0)), (a*d**2*x**2/2, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 237 vs. 2(107) = 214.

Time = 0.29 (sec) , antiderivative size = 237, normalized size of antiderivative = 1.91

$$\int x(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx=\frac{1}{6}ac^4d^2x^6-\frac{1}{2}ac^2d^2x^4$$
$$+\frac{1}{288}\left(48x^6\arcsin(cx)+\left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2}+\frac{10\sqrt{-c^2x^2+1}x^3}{c^4}+\frac{15\sqrt{-c^2x^2+1}x}{c^6}-\frac{15\arcsin(cx)}{c^7}\right)c$$
$$-\frac{1}{16}\left(8x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\arcsin(cx)}{c^5}\right)c\right)bc^2d^2$$
$$+\frac{1}{2}ad^2x^2+\frac{1}{4}\left(2x^2\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2}-\frac{\arcsin(cx)}{c^3}\right)\right)bd^2$$

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/6*a*c^4*d^2*x^6 - 1/2*a*c^2*d^2*x^4 + 1/288*(48*x^6*arcsin(c*x) + (8*sqrt
(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 +
 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*c^4*d^2 - 1/16*(8*x^4*arcsin(c*x) + (2
*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^
5)*c)*b*c^2*d^2 + 1/2*a*d^2*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2
 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.27

$$\int x\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))\,dx = \frac{1}{6}ac^4d^2x^6 - \frac{1}{2}ac^2d^2x^4 + \frac{\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}bd^2x}{36\,c} + \frac{\left(c^2x^2-1\right)^3bd^2\arcsin\left(cx\right)}{6\,c^2} + \frac{5\left(-c^2x^2+1\right)^{\frac{3}{2}}bd^2x}{144\,c} + \frac{5\sqrt{-c^2x^2+1}bd^2x}{96\,c} + \frac{\left(c^2x^2-1\right)ad^2}{2\,c^2} + \frac{5\,bd^2\arcsin\left(cx\right)}{96\,c^2}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/6*a*c^4*d^2*x^6 - 1/2*a*c^2*d^2*x^4 + 1/36*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2
+ 1)*b*d^2*x/c + 1/6*(c^2*x^2 - 1)^3*b*d^2*arcsin(c*x)/c^2 + 5/144*(-c^2*x^
2 + 1)^(3/2)*b*d^2*x/c + 5/96*sqrt(-c^2*x^2 + 1)*b*d^2*x/c + 1/2*(c^2*x^2 -
 1)*a*d^2/c^2 + 5/96*b*d^2*arcsin(c*x)/c^2
```

Mupad [F(-1)]

Timed out.

$$\int x\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))\,dx = \int x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^2\,dx$$

```
[In] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^2,x)
```

```
[Out] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^2, x)
```

3.14 $\int (d-c^2dx^2)^2 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 22, antiderivative size = 131

$$\int (d-c^2dx^2)^2 (a+b\arcsin(cx))\,dx = \frac{8bd^2\sqrt{1-c^2x^2}}{15c}+\frac{4bd^2(1-c^2x^2)^{3/2}}{45c}+\frac{bd^2(1-c^2x^2)^{5/2}}{25c} + d^2x(a+b\arcsin(cx))-\frac{2}{3}c^2d^2x^3(a+b\arcsin(cx)) + \frac{1}{5}c^4d^2x^5(a+b\arcsin(cx))$$

```
[Out] 4/45*b*d^2*(-c^2*x^2+1)^(3/2)/c+1/25*b*d^2*(-c^2*x^2+1)^(5/2)/c+d^2*x*(a+b*
arcsin(c*x))-2/3*c^2*d^2*x^3*(a+b*arcsin(c*x))+1/5*c^4*d^2*x^5*(a+b*arcsin(
c*x))+8/15*b*d^2*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {200, 4739, 12, 1261, 712}

$$\int (d-c^2dx^2)^2 (a+b\arcsin(cx))\,dx = \frac{1}{5}c^4d^2x^5(a+b\arcsin(cx))-\frac{2}{3}c^2d^2x^3(a+b\arcsin(cx)) + d^2x(a+b\arcsin(cx))+\frac{bd^2(1-c^2x^2)^{5/2}}{25c} + \frac{4bd^2(1-c^2x^2)^{3/2}}{45c}+\frac{8bd^2\sqrt{1-c^2x^2}}{15c}$$

```
[In] Int[(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*d^2*Sqrt[1 - c^2*x^2])/(15*c) + (4*b*d^2*(1 - c^2*x^2)^(3/2))/(45*c) +
 (b*d^2*(1 - c^2*x^2)^(5/2))/(25*c) + d^2*x*(a + b*ArcSin[c*x]) - (2*c^2*d^
2*x^3*(a + b*ArcSin[c*x]))/3 + (c^4*d^2*x^5*(a + b*ArcSin[c*x]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= d^2x(a+b\arcsin(cx))-\frac{2}{3}c^2d^2x^3(a+b\arcsin(cx))\\ &\quad+\frac{1}{5}c^4d^2x^5(a+b\arcsin(cx))-(bc)\int\frac{d^2x(15-10c^2x^2+3c^4x^4)}{15\sqrt{1-c^2x^2}}\,dx\\ &= d^2x(a+b\arcsin(cx))-\frac{2}{3}c^2d^2x^3(a+b\arcsin(cx))\\ &\quad+\frac{1}{5}c^4d^2x^5(a+b\arcsin(cx))-\frac{1}{15}\left(bcd^2\right)\int\frac{x(15-10c^2x^2+3c^4x^4)}{\sqrt{1-c^2x^2}}\,dx\end{aligned}$$

$$
\begin{aligned}
&= d^2x(a+b\arcsin(cx)) - \frac{2}{3}c^2d^2x^3(a+b\arcsin(cx)) + \frac{1}{5}c^4d^2x^5(a+b\arcsin(cx)) \\
&\quad - \frac{1}{30}(bcd^2)\operatorname{Subst}\left(\int \frac{15-10c^2x+3c^4x^2}{\sqrt{1-c^2x}}\,dx, x, x^2\right) \\
&= d^2x(a+b\arcsin(cx)) - \frac{2}{3}c^2d^2x^3(a+b\arcsin(cx)) + \frac{1}{5}c^4d^2x^5(a+b\arcsin(cx)) \\
&\quad - \frac{1}{30}(bcd^2)\operatorname{Subst}\left(\int \left(\frac{8}{\sqrt{1-c^2x}} + 4\sqrt{1-c^2x} + 3(1-c^2x)^{3/2}\right)dx, x, x^2\right) \\
&= \frac{8bd^2\sqrt{1-c^2x^2}}{15c} + \frac{4bd^2(1-c^2x^2)^{3/2}}{45c} + \frac{bd^2(1-c^2x^2)^{5/2}}{25c} \\
&\quad + d^2x(a+b\arcsin(cx)) - \frac{2}{3}c^2d^2x^3(a+b\arcsin(cx)) + \frac{1}{5}c^4d^2x^5(a+b\arcsin(cx))
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.73

$$
\int (d-c^2dx^2)^2 (a+b\arcsin(cx))\,dx
$$

$$
= \frac{d^2\left(15acx(15-10c^2x^2+3c^4x^4)+b\sqrt{1-c^2x^2}(149-38c^2x^2+9c^4x^4)+15bcx(15-10c^2x^2+3c^4x^4)\arcsin\right.}{225c}
$$

```
[In] Integrate[(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
[Out] (d^2*(15*a*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(149 - 3
8*c^2*x^2 + 9*c^4*x^4) + 15*b*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x]
))/(225*c)
```

Maple [A] (verified)

Time = 0.09 (sec) , antiderivative size = 119, normalized size of antiderivative = 0.91

method	result
parts	$d^2a\left(\frac{1}{5}c^4x^5-\frac{2}{3}c^2x^3+x\right)+\frac{d^2b\left(\frac{\arcsin(cx)c^5x^5}{5}-\frac{2c^3x^3\arcsin(cx)}{3}+cx\arcsin(cx)+\frac{149\sqrt{-c^2x^2+1}}{225}+\frac{c^4x^4\sqrt{-c^2x^2+1}}{25}\right.}{c}$
derivativedivides	$\frac{d^2a\left(\frac{1}{5}c^5x^5-\frac{2}{3}c^3x^3+cx\right)+d^2b\left(\frac{\arcsin(cx)c^5x^5}{5}-\frac{2c^3x^3\arcsin(cx)}{3}+cx\arcsin(cx)+\frac{149\sqrt{-c^2x^2+1}}{225}+\frac{c^4x^4\sqrt{-c^2x^2+1}}{25}-\frac{38c^2x^2\sqrt{}}{2}\right.}{c}$
default	$\frac{d^2a\left(\frac{1}{5}c^5x^5-\frac{2}{3}c^3x^3+cx\right)+d^2b\left(\frac{\arcsin(cx)c^5x^5}{5}-\frac{2c^3x^3\arcsin(cx)}{3}+cx\arcsin(cx)+\frac{149\sqrt{-c^2x^2+1}}{225}+\frac{c^4x^4\sqrt{-c^2x^2+1}}{25}-\frac{38c^2x^2\sqrt{}}{2}\right.}{c}$

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] d^2*a*(1/5*c^4*x^5-2/3*c^2*x^3+x)+d^2*b/c*(1/5*arcsin(c*x)*c^5*x^5-2/3*c^3*
x^3*arcsin(c*x)+c*x*arcsin(c*x)+149/225*(-c^2*x^2+1)^(1/2)+1/25*c^4*x^4*(-c
^2*x^2+1)^(1/2)-38/225*c^2*x^2*(-c^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 121, normalized size of antiderivative = 0.92

$$\int \left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))\,dx = \frac{45\,ac^5d^2x^5 - 150\,ac^3d^2x^3 + 225\,acd^2x + 15\,(3\,bc^5d^2x^5 - 10\,bc^3d^2x^3 + 15\,bcd^2x)\arcsin{(cx)} + (9\,bc^4d^2x^4 -}{225\,c}$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/225*(45*a*c^5*d^2*x^5 - 150*a*c^3*d^2*x^3 + 225*a*c*d^2*x + 15*(3*b*c^5*d
^2*x^5 - 10*b*c^3*d^2*x^3 + 15*b*c*d^2*x)*arcsin(c*x) + (9*b*c^4*d^2*x^4 -
38*b*c^2*d^2*x^2 + 149*b*d^2)*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 165, normalized size of antiderivative = 1.26

$$\int \left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))\,dx = \begin{cases} \frac{ac^4d^2x^5}{5} - \frac{2ac^2d^2x^3}{3} + ad^2x + \frac{bc^4d^2x^5\operatorname{asin}{(cx)}}{5} + \frac{bc^3d^2x^4\sqrt{-c^2x^2+1}}{25} - \frac{2bc^2d^2x^3\operatorname{asin}{(cx)}}{3} - \frac{38bcd^2x^2\sqrt{-c^2x^2+1}}{225} + bd^2x\operatorname{asi} \\ ad^2x \end{cases}$$

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*c**4*d**2*x**5/5 - 2*a*c**2*d**2*x**3/3 + a*d**2*x + b*c**4*d*
*2*x**5*asin(c*x)/5 + b*c**3*d**2*x**4*sqrt(-c**2*x**2 + 1)/25 - 2*b*c**2*d
**2*x**3*asin(c*x)/3 - 38*b*c*d**2*x**2*sqrt(-c**2*x**2 + 1)/225 + b*d**2*x
*asin(c*x) + 149*b*d**2*sqrt(-c**2*x**2 + 1)/(225*c), Ne(c, 0)), (a*d**2*x,
 True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 196, normalized size of antiderivative = 1.50

$$\int \left(d - c^2 d x^2\right)^2 (a + b \arcsin(cx)) \, dx = \frac{1}{5} a c^4 d^2 x^5 + \frac{1}{75} \left(15 x^5 \arcsin(cx) + \left(\frac{3 \sqrt{-c^2 x^2 + 1} x^4}{c^2} + \frac{4 \sqrt{-c^2 x^2 + 1} x^2}{c^4} + \frac{8 \sqrt{-c^2 x^2 + 1}}{c^6}\right) c\right) b c^4 d^2 - \frac{2}{3} a c^2 d^2 x^3 - \frac{2}{9} \left(3 x^3 \arcsin(cx) + c \left(\frac{\sqrt{-c^2 x^2 + 1} x^2}{c^2} + \frac{2 \sqrt{-c^2 x^2 + 1}}{c^4}\right)\right) b c^2 d^2 + a d^2 x + \frac{\left(cx \arcsin(cx) + \sqrt{-c^2 x^2 + 1}\right) b d^2}{c}$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*c^4*d^2*x^5 + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^
2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*c^4*d^2 -
 2/3*a*c^2*d^2*x^3 - 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2
 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^2*d^2 + a*d^2*x + (c*x*arcsin(c*x) + sqrt
(-c^2*x^2 + 1))*b*d^2/c
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.21

$$\int \left(d - c^2 d x^2\right)^2 (a + b \arcsin(cx)) \, dx = \frac{1}{5} a c^4 d^2 x^5 - \frac{2}{3} a c^2 d^2 x^3 + \frac{1}{5} \left(c^2 x^2 - 1\right)^2 b d^2 x \arcsin(cx) - \frac{4}{15} \left(c^2 x^2 - 1\right) b d^2 x \arcsin(cx) + \frac{8}{15} b d^2 x \arcsin(cx) + \frac{\left(c^2 x^2 - 1\right)^2 \sqrt{-c^2 x^2 + 1} b d^2}{25 c} + a d^2 x + \frac{4 \left(-c^2 x^2 + 1\right)^{\frac{3}{2}} b d^2}{45 c} + \frac{8 \sqrt{-c^2 x^2 + 1} b d^2}{15 c}$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/5*a*c^4*d^2*x^5 - 2/3*a*c^2*d^2*x^3 + 1/5*(c^2*x^2 - 1)^2*b*d^2*x*arcsin(
c*x) - 4/15*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*x) + 8/15*b*d^2*x*arcsin(c*x) +
1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2/c + a*d^2*x + 4/45*(-c^2*x^2
+ 1)^(3/2)*b*d^2/c + 8/15*sqrt(-c^2*x^2 + 1)*b*d^2/c
```

Mupad [F(-1)]

Timed out.

$$\int \left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))\,dx=\int (a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^2\,dx$$

```
[In] int((a + b*asin(c*x))*(d - c^2*d*x^2)^2,x)
[Out] int((a + b*asin(c*x))*(d - c^2*d*x^2)^2, x)
```

3.15 $\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 184

$$\begin{aligned}\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x}\,dx &= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2}-\frac{1}{16}bcd^2x(1-c^2x^2)^{3/2}\\&\quad-\frac{11}{32}bd^2\arcsin(cx)+\frac{1}{2}d^2(1-c^2x^2)(a+b\arcsin(cx))\\&\quad+\frac{1}{4}d^2(1-c^2x^2)^2(a+b\arcsin(cx))\\&\quad-\frac{id^2(a+b\arcsin(cx))^2}{2b}\\&\quad+d^2(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)\\&\quad-\frac{1}{2}ibd^2\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\end{aligned}$$

```
[Out] -1/16*b*c*d^2*x*(-c^2*x^2+1)^(3/2)-11/32*b*d^2*arcsin(c*x)+1/2*d^2*(-c^2*x^
2+1)*(a+b*arcsin(c*x))+1/4*d^2*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))-1/2*I*d^2*(
a+b*arcsin(c*x))^2/b+d^2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^
2)-1/2*I*b*d^2*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-11/32*b*c*d^2*x*(-c^
2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {4773, 4721, 3798, 2221, 2317, 2438, 201, 222}

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x}\,dx = \frac{1}{4}d^2(1-c^2x^2)^2(a+b\arcsin(cx)) + \frac{1}{2}d^2(1-c^2x^2)(a+b\arcsin(cx)) - \frac{id^2(a+b\arcsin(cx))^2}{2b} + d^2\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx)) - \frac{1}{2}ibd^2\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) - \frac{11}{32}bd^2\arcsin(cx) - \frac{1}{16}bcd^2x(1-c^2x^2)^{3/2} - \frac{11}{32}bcd^2x\sqrt{1-c^2x^2}$$

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (-11*b*c*d^2*x*Sqrt[1 - c^2*x^2])/32 - (b*c*d^2*x*(1 - c^2*x^2)^(3/2))/16 - (11*b*d^2*ArcSin[c*x])/32 + (d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/2 + (d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/4 - ((I/2)*d^2*(a + b*ArcSin[c*x])^2)/b + d^2*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] - (I/2)*b*d^2*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p + 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] && IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n], Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Dist[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) \\
&\quad + d\int\frac{(d-c^2dx^2)\,(a+b\arcsin(cx))}{x}\,dx-\frac{1}{4}\left(bcd^2\right)\int\left(1-c^2x^2\right)^{3/2}\,dx \\
&= -\frac{1}{16}bcd^2x\left(1-c^2x^2\right)^{3/2}+\frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\arcsin(cx))+\frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) \\
&\quad + d^2\int\frac{a+b\arcsin(cx)}{x}\,dx-\frac{1}{16}\left(3bcd^2\right)\int\sqrt{1-c^2x^2}\,dx \\
&\quad - \frac{1}{2}\left(bcd^2\right)\int\sqrt{1-c^2x^2}\,dx
\end{aligned}$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2} - \frac{1}{16}bcd^2x\left(1-c^2x^2\right)^{3/2} + \frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\arcsin(cx)) + \frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) + d^2\text{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \arcsin(cx)\right) - \frac{1}{32}\left(3bcd^2\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx - \frac{1}{4}\left(bcd^2\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2} - \frac{1}{16}bcd^2x\left(1-c^2x^2\right)^{3/2} - \frac{11}{32}bd^2\arcsin(cx) + \frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\arcsin(cx)) + \frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) - \frac{id^2(a+b\arcsin(cx))^2}{2b} - \left(2id^2\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2} - \frac{1}{16}bcd^2x\left(1-c^2x^2\right)^{3/2} - \frac{11}{32}bd^2\arcsin(cx) + \frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\arcsin(cx)) + \frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) - \frac{id^2(a+b\arcsin(cx))^2}{2b} + d^2(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) - \left(bd^2\right)\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2} - \frac{1}{16}bcd^2x\left(1-c^2x^2\right)^{3/2} - \frac{11}{32}bd^2\arcsin(cx) + \frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\arcsin(cx)) + \frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) - \frac{id^2(a+b\arcsin(cx))^2}{2b} + d^2(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) + \frac{1}{2}\left(ibd^2\right)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)$$

$$= -\frac{11}{32}bcd^2x\sqrt{1-c^2x^2} - \frac{1}{16}bcd^2x\left(1-c^2x^2\right)^{3/2} - \frac{11}{32}bd^2\arcsin(cx) + \frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\arcsin(cx)) + \frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) - \frac{id^2(a+b\arcsin(cx))^2}{2b} + d^2(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) - \frac{1}{2}ibd^2\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.44 (sec) , antiderivative size = 166, normalized size of antiderivative = 0.90

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x}\,dx = \frac{1}{32}d^2\Big(-32ac^2x^2+8ac^4x^4-13bcx\sqrt{1-c^2x^2} + 2bc^3x^3\sqrt{1-c^2x^2}-16ib\arcsin(cx)^2 + 26b\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right) + 8b\arcsin(cx)\left(-4c^2x^2+c^4x^4 + 4\log\left(1-e^{2i\arcsin(cx)}\right)\right)+32a\log(x) - 16ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\Big)$$

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (d^2*(-32*a*c^2*x^2 + 8*a*c^4*x^4 - 13*b*c*x*Sqrt[1 - c^2*x^2] + 2*b*c^3*x^
3*Sqrt[1 - c^2*x^2] - (16*I)*b*ArcSin[c*x]^2 + 26*b*ArcTan[(c*x)/(-1 + Sqrt
[1 - c^2*x^2])] + 8*b*ArcSin[c*x]*(-4*c^2*x^2 + c^4*x^4 + 4*Log[1 - E^((2*I
)*ArcSin[c*x])]) + 32*a*Log[x] - (16*I)*b*PolyLog[2, E^((2*I)*ArcSin[c*x])]
))/32
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.01

method	result
parts	$d^2a\left(\frac{c^4x^4}{4}-c^2x^2+\ln(x)\right)+d^2b\left(-\frac{i\arcsin(cx)^2}{2}+\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)-\right.$
derivativedivides	$d^2a\left(\frac{c^4x^4}{4}-c^2x^2+\ln(cx)\right)+d^2b\left(-\frac{i\arcsin(cx)^2}{2}+\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)-\right.$
default	$d^2a\left(\frac{c^4x^4}{4}-c^2x^2+\ln(cx)\right)+d^2b\left(-\frac{i\arcsin(cx)^2}{2}+\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)-\right.$

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] d^2*a*(1/4*c^4*x^4-c^2*x^2+ln(x))+d^2*b*(-1/2*I*arcsin(c*x)^2+arcsin(c*x)*l
n(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+arcsin
(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+
1/32*arcsin(c*x)*cos(4*arcsin(c*x))-1/128*sin(4*arcsin(c*x))+3/8*arcsin(c*x
)*cos(2*arcsin(c*x))-3/16*sin(2*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))}{x} \, dx = \int \frac{{\left(c^{2} d x^{2} - d\right)}^{2} {\left(b \arcsin\left(c x\right) + a\right)}}{x} \,d x$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))/x, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))}{x} \, dx = d^{2} \left(\int \frac{a}{x}\, dx + \int \left(- 2 a c^{2} x\right)\, dx + \int a c^{4} x^{3}\, dx + \int \frac{b \operatorname{asin}{\left(c x \right)}}{x}\, dx + \int \left(- 2 b c^{2} x \operatorname{asin}{\left(c x \right)}\right)\, dx + \int b c^{4} x^{3} \operatorname{asin}{\left(c x \right)}\, dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))/x,x)
```

```
[Out] d**2*(Integral(a/x, x) + Integral(-2*a*c**2*x, x) + Integral(a*c**4*x**3, x
) + Integral(b*asin(c*x)/x, x) + Integral(-2*b*c**2*x*asin(c*x), x) + Integ
ral(b*c**4*x**3*asin(c*x), x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))}{x} \, dx = \int \frac{{\left(c^{2} d x^{2} - d\right)}^{2} {\left(b \arcsin\left(c x\right) + a\right)}}{x} \,d x$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/4*a*c^4*d^2*x^4 - a*c^2*d^2*x^2 + a*d^2*log(x) + integrate((b*c^4*d^2*x^4
 - 2*b*c^2*d^2*x^2 + b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x
)
```

Giac [F]

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))}{x}\,dx = \int \frac{(c^2dx^2-d)^2(b\arcsin(cx)+a)}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="giac")
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)^2}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x, x)
```

3.16 $\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 123

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^2}\,dx = -\frac{5}{3}bcd^2\sqrt{1-c^2x^2}-\frac{1}{9}bcd^2(1-c^2x^2)^{3/2} - \frac{d^2(a+b\arcsin(cx))}{x} - 2c^2d^2x(a+b\arcsin(cx))+\frac{1}{3}c^4d^2x^3(a+b\arcsin(cx)) - bcd^2\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -1/9*b*c*d^2*(-c^2*x^2+1)^(3/2)-d^2*(a+b*arcsin(c*x))/x-2*c^2*d^2*x*(a+b*ar
csin(c*x))+1/3*c^4*d^2*x^3*(a+b*arcsin(c*x))-b*c*d^2*arctanh((-c^2*x^2+1)^(
1/2))-5/3*b*c*d^2*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {276, 4777, 12, 1265, 911, 1167, 214}

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^2}\,dx = \frac{1}{3}c^4d^2x^3(a+b\arcsin(cx))-2c^2d^2x(a+b\arcsin(cx)) - \frac{d^2(a+b\arcsin(cx))}{x}-bcd^2\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right) - \frac{1}{9}bcd^2(1-c^2x^2)^{3/2}-\frac{5}{3}bcd^2\sqrt{1-c^2x^2}$$

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (-5*b*c*d^2*Sqrt[1 - c^2*x^2])/3 - (b*c*d^2*(1 - c^2*x^2)^(3/2))/9 - (d^2*(
a + b*ArcSin[c*x]))/x - 2*c^2*d^2*x*(a + b*ArcSin[c*x]) + (c^4*d^2*x^3*(a +
 b*ArcSin[c*x]))/3 - b*c*d^2*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
```

```
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^2(a+b\arcsin(cx))}{x} - 2c^2d^2x(a+b\arcsin(cx)) \\
&\quad + \frac{1}{3}c^4d^2x^3(a+b\arcsin(cx)) - (bc)\int \frac{d^2(-3-6c^2x^2+c^4x^4)}{3x\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d^2(a+b\arcsin(cx))}{x} - 2c^2d^2x(a+b\arcsin(cx)) \\
&\quad + \frac{1}{3}c^4d^2x^3(a+b\arcsin(cx)) - \frac{1}{3}\left(bcd^2\right)\int \frac{-3-6c^2x^2+c^4x^4}{x\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d^2(a+b\arcsin(cx))}{x} - 2c^2d^2x(a+b\arcsin(cx)) + \frac{1}{3}c^4d^2x^3(a+b\arcsin(cx)) \\
&\quad - \frac{1}{6}\left(bcd^2\right)\text{Subst}\left(\int \frac{-3-6c^2x+c^4x^2}{x\sqrt{1-c^2x}}\,dx, x, x^2\right) \\
&= -\frac{d^2(a+b\arcsin(cx))}{x} - 2c^2d^2x(a+b\arcsin(cx)) \\
&\quad + \frac{1}{3}c^4d^2x^3(a+b\arcsin(cx)) + \frac{\left(bd^2\right)\text{Subst}\left(\int \frac{-8+4x^2+x^4}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{3c} \\
&= -\frac{d^2(a+b\arcsin(cx))}{x} - 2c^2d^2x(a+b\arcsin(cx)) + \frac{1}{3}c^4d^2x^3(a+b\arcsin(cx)) \\
&\quad + \frac{\left(bd^2\right)\text{Subst}\left(\int \left(-5c^2-c^2x^2-\frac{3}{\frac{1}{c^2}-\frac{x^2}{c^2}}\right)dx, x, \sqrt{1-c^2x^2}\right)}{3c} \\
&= -\frac{5}{3}bcd^2\sqrt{1-c^2x^2} - \frac{1}{9}bcd^2\left(1-c^2x^2\right)^{3/2} - \frac{d^2(a+b\arcsin(cx))}{x} \\
&\quad - 2c^2d^2x(a+b\arcsin(cx)) + \frac{1}{3}c^4d^2x^3(a+b\arcsin(cx)) \\
&\quad - \frac{\left(bd^2\right)\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{c} \\
&= -\frac{5}{3}bcd^2\sqrt{1-c^2x^2} - \frac{1}{9}bcd^2\left(1-c^2x^2\right)^{3/2} - \frac{d^2(a+b\arcsin(cx))}{x} \\
&\quad - 2c^2d^2x(a+b\arcsin(cx)) + \frac{1}{3}c^4d^2x^3(a+b\arcsin(cx)) - bcd^2\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.02

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^2}\,dx$$
$$=\frac{d^2(-9a-18ac^2x^2+3ac^4x^4-16bcx\sqrt{1-c^2x^2}+bc^3x^3\sqrt{1-c^2x^2}+3b(-3-6c^2x^2+c^4x^4)\arcsin(cx)+9b}{9x}$$

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (d^2*(-9*a - 18*a*c^2*x^2 + 3*a*c^4*x^4 - 16*b*c*x*Sqrt[1 - c^2*x^2] + b*c^
3*x^3*Sqrt[1 - c^2*x^2] + 3*b*(-3 - 6*c^2*x^2 + c^4*x^4)*ArcSin[c*x] + 9*b*
c*x*Log[x] - 9*b*c*x*Log[1 + Sqrt[1 - c^2*x^2]]))/(9*x)
```

Maple [A] (verified)

Time = 0.06 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.93

method	result
parts	$d^2a\left(\frac{c^4x^3}{3}-2c^2x-\frac{1}{x}\right)+d^2bc\left(\frac{c^3x^3\arcsin(cx)}{3}-2cx\arcsin(cx)-\frac{\arcsin(cx)}{cx}+\frac{c^2x^2\sqrt{-c^2x^2+1}}{9}-\right.$
derivativedivides	$c\left(d^2a\left(\frac{c^3x^3}{3}-2cx-\frac{1}{cx}\right)+d^2b\left(\frac{c^3x^3\arcsin(cx)}{3}-2cx\arcsin(cx)-\frac{\arcsin(cx)}{cx}+\frac{c^2x^2\sqrt{-c^2x^2+1}}{9}\right.\right.$
default	$c\left(d^2a\left(\frac{c^3x^3}{3}-2cx-\frac{1}{cx}\right)+d^2b\left(\frac{c^3x^3\arcsin(cx)}{3}-2cx\arcsin(cx)-\frac{\arcsin(cx)}{cx}+\frac{c^2x^2\sqrt{-c^2x^2+1}}{9}\right.\right.$

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] d^2*a*(1/3*c^4*x^3-2*c^2*x-1/x)+d^2*b*c*(1/3*c^3*x^3*arcsin(c*x)-2*c*x*arcs
in(c*x)-1/c/x*arcsin(c*x)+1/9*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/9*(-c^2*x^2+1)^
(1/2)-arctanh(1/(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.24

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^2}\,dx$$
$$=\frac{6\,ac^4d^2x^4-36\,ac^2d^2x^2-9\,bcd^2x\log\left(\sqrt{-c^2x^2+1}+1\right)+9\,bcd^2x\log\left(\sqrt{-c^2x^2+1}-1\right)-18\,ad^2+6\,(bc^4d}{18\,x}$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] 1/18*(6*a*c^4*d^2*x^4 - 36*a*c^2*d^2*x^2 - 9*b*c*d^2*x*log(sqrt(-c^2*x^2 +
1) + 1) + 9*b*c*d^2*x*log(sqrt(-c^2*x^2 + 1) - 1) - 18*a*d^2 + 6*(b*c^4*d^2
*x^4 - 6*b*c^2*d^2*x^2 - 3*b*d^2)*arcsin(c*x) + 2*(b*c^3*d^2*x^3 - 16*b*c*d
^2*x)*sqrt(-c^2*x^2 + 1))/x
```

Sympy [A] (verification not implemented)

Time = 2.26 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.50

$$\int \frac{(d-c^2dx^2)^2\,(a+b\arcsin(cx))}{x^2}\,dx = \frac{ac^4d^2x^3}{3} - 2ac^2d^2x - \frac{ad^2}{x} - \frac{bc^5d^2\left(\begin{cases} -\frac{x^2\sqrt{-c^2x^2+1}}{3c^2} - \frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for } c^2 \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}\right)}{3} + \frac{bc^4d^2x^3\operatorname{asin}(cx)}{3} - 2bc^2d^2\left(\begin{cases} 0 & \text{for } c = 0 \\ x\operatorname{asin}(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise} \end{cases}\right) + bcd^2\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|} > 1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) - \frac{bd^2\operatorname{asin}(cx)}{x}$$

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))/x**2,x)
```

```
[Out] a*c**4*d**2*x**3/3 - 2*a*c**2*d**2*x - a*d**2/x - b*c**5*d**2*Piecewise((-x
**2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 + 1)/(3*c**4), Ne(c**
2, 0)), (x**4/4, True))/3 + b*c**4*d**2*x**3*asin(c*x)/3 - 2*b*c**2*d**2*Pi
ecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True)) + b*c*
d**2*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), T
rue)) - b*d**2*asin(c*x)/x
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.30

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^2}\,dx$$
$$=\frac{1}{3}ac^4d^2x^3+\frac{1}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bc^4d^2$$
$$-2ac^2d^2x-2\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)bcd^2$$
$$-\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bd^2-\frac{ad^2}{x}$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a*c^4*d^2*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2
+ 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^4*d^2 - 2*a*c^2*d^2*x - 2*(c*x*arcsin(c*x)
 + sqrt(-c^2*x^2 + 1))*b*c*d^2 - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs
(x)) + arcsin(c*x)/x)*b*d^2 - a*d^2/x
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2717 vs. 2(111) = 222.

Time = 6.34 (sec) , antiderivative size = 2717, normalized size of antiderivative = 22.09

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^2}\,dx = \text{Too large to display}$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^9*d^2*x^8*arcsin(c*x)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5
*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*
x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) - 1/2*a*c^9*d^2*x^8
/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^
5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(s
qrt(-c^2*x^2 + 1) + 1)^8) + b*c^8*d^2*x^7*log(abs(c)*abs(x))/((c^7*x^7/(sqr
t(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(
sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
1) + 1)^7) - b*c^8*d^2*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^7*x^7/(sqrt(-c^2
*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1
)^7) + 16/9*b*c^8*d^2*x^7/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/
(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sq
rt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^7) - 6*b*c^7*d^2*x^6*arcsin
(c*x)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1)
```

```
+ 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1
))*(sqrt(-c^2*x^2 + 1) + 1)^6) - 6*a*c^7*d^2*x^6/((c^7*x^7/(sqrt(-c^2*x^2 +
 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^
2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) +
 3*b*c^6*d^2*x^5*log(abs(c)*abs(x))/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 +
3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3
 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 3*b*c^6*d^2*
x^5*log(sqrt(-c^2*x^2 + 1) + 1)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^
5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c
*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) + 4/3*b*c^6*d^2*x^
5/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)
^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(
sqrt(-c^2*x^2 + 1) + 1)^5) - 25/3*b*c^5*d^2*x^4*arcsin(c*x)/((c^7*x^7/(sqrt
(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1
) + 1)^4) - 25/3*a*c^5*d^2*x^4/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5
*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*
x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 3*b*c^4*d^2*x^3*l
og(abs(c)*abs(x))/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c
^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*
x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 3*b*c^4*d^2*x^3*log(sqrt(-c^2*
x^2 + 1) + 1)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x
^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2
+ 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 4/3*b*c^4*d^2*x^3/((c^7*x^7/(sqrt(
-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1)
 + 1)^3) - 6*b*c^3*d^2*x^2*arcsin(c*x)/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7
 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1
)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 6*a*c^3*d
^2*x^2/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1)
 + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) +
1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + b*c^2*d^2*x*log(abs(c)*abs(x))/((c^7*x^7/
(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x
^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^
2 + 1) + 1)) - b*c^2*d^2*x*log(sqrt(-c^2*x^2 + 1) + 1)/((c^7*x^7/(sqrt(-c^2
*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1
)) - 16/9*b*c^2*d^2*x/((c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-
c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*b*c*d^2*arcsin(c*x)/(c^7
*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*
c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*a*
c*d^2/(c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^5*x^5/(sqrt(-c^2*x^2 + 1) +
 1)^5 + 3*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1)
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))}{x^2}\,dx$$
$$= \begin{cases} b\,c^4\,d^2\left(\frac{\sqrt{\frac{1}{c^2}-x^2}\left(\frac{2}{c^2}+x^2\right)}{9}+\frac{x^3\,\mathrm{asin}(c\,x)}{3}\right)-\frac{a\,d^2\,(-c^4\,x^4+6\,c^2\,x^2+3)}{3\,x}-2\,b\,c\,d^2\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)-b\,c\,d^2 \\ \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)^2}{x^2}\,dx \end{cases}$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x^2,x)
```

```
[Out] piecewise(0 < c, - b*c*d^2*atanh(1/(- c^2*x^2 + 1)^(1/2)) - (a*d^2*(6*c^2*x
^2 - c^4*x^4 + 3))/(3*x) - 2*b*c*d^2*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)
) + b*c^4*d^2*(((1/c^2 - x^2)^(1/2)*(2/c^2 + x^2))/9 + (x^3*asin(c*x))/3) -
 (b*d^2*asin(c*x))/x, ~0 < c, int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x^2
, x))
```

3.17 $\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^3}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 201

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^3}\,dx = -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2}-\frac{bcd^2(1-c^2x^2)^{3/2}}{2x} -\frac{1}{4}bc^2d^2\arcsin(cx)-c^2d^2(1-c^2x^2)(a+b\arcsin(cx)) -\frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))}{2x^2} +\frac{ic^2d^2(a+b\arcsin(cx))^2}{b} -2c^2d^2(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) +ibc^2d^2\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)$$

```
[Out] -1/2*b*c*d^2*(-c^2*x^2+1)^(3/2)/x-1/4*b*c^2*d^2*arcsin(c*x)-c^2*d^2*(-c^2*x
^2+1)*(a+b*arcsin(c*x))-1/2*d^2*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/x^2+I*c^2*
d^2*(a+b*arcsin(c*x))^2/b-2*c^2*d^2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2
+1)^(1/2))^2)+I*b*c^2*d^2*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/4*b*c^3
*d^2*x*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 201, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4775, 283, 201, 222, 4773, 4721, 3798, 2221, 2317, 2438}

$$\begin{aligned}\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^3}\,dx = &-c^2d^2(1-c^2x^2)(a+b\arcsin(cx))\\ &-\frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))}{2x^2}\\ &+\frac{ic^2d^2(a+b\arcsin(cx))^2}{b}\\ &-2c^2d^2\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))\\ &+ibc^2d^2\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)-\frac{1}{4}bc^2d^2\arcsin(cx)\\ &-\frac{bcd^2(1-c^2x^2)^{3/2}}{2x}-\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2}\end{aligned}$$

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/4*(b*c^3*d^2*x*Sqrt[1 - c^2*x^2]) - (b*c*d^2*(1 - c^2*x^2)^(3/2))/(2*x)
- (b*c^2*d^2*ArcSin[c*x])/4 - c^2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]) - (
d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(2*x^2) + (I*c^2*d^2*(a + b*ArcSin
[c*x])^2)/b - 2*c^2*d^2*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])]
+ I*b*c^2*d^2*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 283

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^p/(c*(m + 1))), x] - Dist[b*n*(p/(c^n*(m + 1))), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcSin[c*x
])/(f*(m + 1))), x] + (-Dist[b*c*(d^p/(f*(m + 1))), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
```

```
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^2(1-c^2x^2)^2\,(a+b\arcsin(cx))}{2x^2} \\
&\quad -\left(2c^2d\right)\int\frac{(d-c^2dx^2)\,(a+b\arcsin(cx))}{x}\,dx+\frac{1}{2}\left(bcd^2\right)\int\frac{(1-c^2x^2)^{3/2}}{x^2}\,dx \\
&= -\frac{bcd^2(1-c^2x^2)^{3/2}}{2x}-c^2d^2\left(1-c^2x^2\right)(a+b\arcsin(cx))-\frac{d^2(1-c^2x^2)^2\,(a+b\arcsin(cx))}{2x^2} \\
&\quad -\left(2c^2d^2\right)\int\frac{a+b\arcsin(cx)}{x}\,dx+\left(bc^3d^2\right)\int\sqrt{1-c^2x^2}\,dx \\
&\quad -\frac{1}{2}\left(3bc^3d^2\right)\int\sqrt{1-c^2x^2}\,dx \\
&= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2}-\frac{bcd^2(1-c^2x^2)^{3/2}}{2x} \\
&\quad -c^2d^2\left(1-c^2x^2\right)(a+b\arcsin(cx))-\frac{d^2(1-c^2x^2)^2\,(a+b\arcsin(cx))}{2x^2} \\
&\quad -\left(2c^2d^2\right)\text{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)+\frac{1}{2}\left(bc^3d^2\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx \\
&\quad -\frac{1}{4}\left(3bc^3d^2\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2}-\frac{bcd^2(1-c^2x^2)^{3/2}}{2x}-\frac{1}{4}bc^2d^2\arcsin(cx) \\
&\quad -c^2d^2\left(1-c^2x^2\right)(a+b\arcsin(cx))-\frac{d^2(1-c^2x^2)^2\,(a+b\arcsin(cx))}{2x^2} \\
&\quad +\frac{ic^2d^2(a+b\arcsin(cx))^2}{b}+\left(4ic^2d^2\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right) \\
&= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2}-\frac{bcd^2(1-c^2x^2)^{3/2}}{2x}-\frac{1}{4}bc^2d^2\arcsin(cx) \\
&\quad -c^2d^2\left(1-c^2x^2\right)(a+b\arcsin(cx))-\frac{d^2(1-c^2x^2)^2\,(a+b\arcsin(cx))}{2x^2} \\
&\quad +\frac{ic^2d^2(a+b\arcsin(cx))^2}{b}-2c^2d^2(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) \\
&\quad +\left(2bc^2d^2\right)\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)
\end{aligned}$$

$$= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2} - \frac{bcd^2(1-c^2x^2)^{3/2}}{2x} - \frac{1}{4}bc^2d^2\arcsin(cx) - c^2d^2(1-c^2x^2)(a+b\arcsin(cx)) - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))}{2x^2} + \frac{ic^2d^2(a+b\arcsin(cx))^2}{b} - 2c^2d^2(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) - (ibc^2d^2)\,\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)$$

$$= -\frac{1}{4}bc^3d^2x\sqrt{1-c^2x^2} - \frac{bcd^2(1-c^2x^2)^{3/2}}{2x} - \frac{1}{4}bc^2d^2\arcsin(cx) - c^2d^2(1-c^2x^2)(a+b\arcsin(cx)) - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))}{2x^2} + \frac{ic^2d^2(a+b\arcsin(cx))^2}{b} - 2c^2d^2(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) + ibc^2d^2\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 185, normalized size of antiderivative = 0.92

$$\int\frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^3}\,dx = \frac{d^2\left(-2a+2ac^4x^4-2bcx\sqrt{1-c^2x^2}+bc^3x^3\sqrt{1-c^2x^2}+4ibc^2x^2\arcsin(cx)^2-2bc^2x^2\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] (d^2*(-2*a + 2*a*c^4*x^4 - 2*b*c*x*Sqrt[1 - c^2*x^2] + b*c^3*x^3*Sqrt[1 - c
^2*x^2] + (4*I)*b*c^2*x^2*ArcSin[c*x]^2 - 2*b*c^2*x^2*ArcTan[(c*x)/(-1 + Sq
rt[1 - c^2*x^2])] + 2*b*ArcSin[c*x]*(-1 + c^4*x^4 - 4*c^2*x^2*Log[1 - E^((2
*I)*ArcSin[c*x])]) - 8*a*c^2*x^2*Log[x] + (4*I)*b*c^2*x^2*PolyLog[2, E^((2*
I)*ArcSin[c*x])]))/(4*x^2)
```

Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 258, normalized size of antiderivative = 1.28

method	result
derivativedivides	$c^2\left(d^2a\left(\frac{c^2x^2}{2}-\frac{1}{2c^2x^2}-2\ln(cx)\right)+id^2b\arcsin(cx)^2+\frac{bc\,d^2x\sqrt{-c^2x^2+1}}{4}+\frac{d^2b\arcsin(cx)c^2x^2}{2}-\right.$
default	$c^2\left(d^2a\left(\frac{c^2x^2}{2}-\frac{1}{2c^2x^2}-2\ln(cx)\right)+id^2b\arcsin(cx)^2+\frac{bc\,d^2x\sqrt{-c^2x^2+1}}{4}+\frac{d^2b\arcsin(cx)c^2x^2}{2}-\right.$
parts	$d^2a\left(\frac{c^4x^2}{2}-\frac{1}{2x^2}-2c^2\ln(x)\right)+id^2b\,c^2\arcsin(cx)^2+\frac{b\,c^3d^2x\sqrt{-c^2x^2+1}}{4}+\frac{d^2b\,c^4\arcsin(cx)x^2}{2}+$

[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)

[Out] c^2*(d^2*a*(1/2*c^2*x^2-1/2/c^2/x^2-2*ln(c*x))+I*d^2*b*arcsin(c*x)^2+1/4*b*c*d^2*x*(-c^2*x^2+1)^(1/2)+1/2*d^2*b*arcsin(c*x)*c^2*x^2-1/4*b*d^2*arcsin(c*x)+1/2*I*d^2*b-1/2*d^2*b/c/x*(-c^2*x^2+1)^(1/2)-1/2*d^2*b*arcsin(c*x)/c^2/x^2-2*d^2*b*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*d^2*b*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*d^2*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*d^2*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)))

Fricas [F]

$$\int \frac{(d-c^2dx^2)^2\,(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(c^2dx^2-d)^2(b\arcsin(cx)+a)}{x^3}\,dx$$

[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")

[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^2*d^2*x^2 + b*d^2)*arcsin(c*x))/x^3, x)

Sympy [F]

$$\int \frac{(d-c^2dx^2)^2\,(a+b\arcsin(cx))}{x^3}\,dx = d^2\left(\int \frac{a}{x^3}\,dx + \int \left(-\frac{2ac^2}{x}\right)dx + \int ac^4x\,dx + \int \frac{b\operatorname{asin}(cx)}{x^3}\,dx + \int \left(-\frac{2bc^2\operatorname{asin}(cx)}{x}\right)dx + \int bc^4x\operatorname{asin}(cx)\,dx\right)$$

[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))/x**3,x)

[Out] d**2*(Integral(a/x**3, x) + Integral(-2*a*c**2/x, x) + Integral(a*c**4*x, x) + Integral(b*asin(c*x)/x**3, x) + Integral(-2*b*c**2*asin(c*x)/x, x) + Integral(b*c**4*x*asin(c*x), x))

Maxima [F]

$$\int \frac{(d-c^2dx^2)^2\,(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(c^2dx^2-d)^2(b\arcsin{(cx)}+a)}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*a*c^4*d^2*x^2 - 2*a*c^2*d^2*log(x) - 1/2*b*d^2*(sqrt(-c^2*x^2 + 1)*c/x
+ arcsin(c*x)/x^2) - 1/2*a*d^2/x^2 + integrate((b*c^4*d^2*x^2 - 2*b*c^2*d^2
)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Giac [F]

$$\int \frac{(d-c^2dx^2)^2\,(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(c^2dx^2-d)^2(b\arcsin{(cx)}+a)}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)/x^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^2\,(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^2}{x^3}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x^3, x)
```

3.18 $\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^4}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 128

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^4}\,dx = bc^3d^2\sqrt{1-c^2x^2}-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{d^2(a+b\arcsin(cx))}{3x^3}+\frac{2c^2d^2(a+b\arcsin(cx))}{x}+c^4d^2x(a+b\arcsin(cx))+\frac{11}{6}bc^3d^2\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -1/3*d^2*(a+b*arcsin(c*x))/x^3+2*c^2*d^2*(a+b*arcsin(c*x))/x+c^4*d^2*x*(a+b
*arcsin(c*x))+11/6*b*c^3*d^2*arctanh((-c^2*x^2+1)^(1/2))+b*c^3*d^2*(-c^2*x^
2+1)^(1/2)-1/6*b*c*d^2*(-c^2*x^2+1)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {276, 4777, 12, 1265, 911, 1171, 396, 214}

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^4}\,dx = c^4d^2x(a+b\arcsin(cx))+\frac{2c^2d^2(a+b\arcsin(cx))}{x}-\frac{d^2(a+b\arcsin(cx))}{3x^3}+\frac{11}{6}bc^3d^2\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)-\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}+bc^3d^2\sqrt{1-c^2x^2}$$

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] b*c^3*d^2*Sqrt[1 - c^2*x^2] - (b*c*d^2*Sqrt[1 - c^2*x^2])/(6*x^2) - (d^2*(a
 + b*ArcSin[c*x]))/(3*x^3) + (2*c^2*d^2*(a + b*ArcSin[c*x]))/x + c^4*d^2*x*
(a + b*ArcSin[c*x]) + (11*b*c^3*d^2*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1171

```
Int[((d_) + (e_.)*(x_)^2)^(q_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 + c*x^4)^p, d + e*x^2
, x], R = Coeff[PolynomialRemainder[(a + b*x^2 + c*x^4)^p, d + e*x^2, x], x
, 0]}, Simp[(-R)*x*((d + e*x^2)^(q + 1)/(2*d*(q + 1))), x] + Dist[1/(2*d*(q
 + 1)), Int[(d + e*x^2)^(q + 1)*ExpandToSum[2*d*(q + 1)*Qx + R*(2*q + 3), x
], x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2
```

```
 - b*d*e + a*e^2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^2(a+b\arcsin(cx))}{3x^3}+\frac{2c^2d^2(a+b\arcsin(cx))}{x}\\
&\quad+c^4d^2x(a+b\arcsin(cx))-(bc)\int\frac{d^2(-1+6c^2x^2+3c^4x^4)}{3x^3\sqrt{1-c^2x^2}}\,dx\\
&= -\frac{d^2(a+b\arcsin(cx))}{3x^3}+\frac{2c^2d^2(a+b\arcsin(cx))}{x}\\
&\quad+c^4d^2x(a+b\arcsin(cx))-\frac{1}{3}\left(bcd^2\right)\int\frac{-1+6c^2x^2+3c^4x^4}{x^3\sqrt{1-c^2x^2}}\,dx\\
&= -\frac{d^2(a+b\arcsin(cx))}{3x^3}+\frac{2c^2d^2(a+b\arcsin(cx))}{x}+c^4d^2x(a+b\arcsin(cx))\\
&\quad-\frac{1}{6}\left(bcd^2\right)\text{Subst}\left(\int\frac{-1+6c^2x+3c^4x^2}{x^2\sqrt{1-c^2x}}\,dx,x,x^2\right)\\
&= -\frac{d^2(a+b\arcsin(cx))}{3x^3}+\frac{2c^2d^2(a+b\arcsin(cx))}{x}\\
&\quad+c^4d^2x(a+b\arcsin(cx))+\frac{\left(bd^2\right)\text{Subst}\left(\int\frac{8-12x^2+3x^4}{\left(\frac{1}{c^2}-\frac{x^2}{c^2}\right)^2}\,dx,x,\sqrt{1-c^2x^2}\right)}{3c}\\
&= -\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2}-\frac{d^2(a+b\arcsin(cx))}{3x^3}+\frac{2c^2d^2(a+b\arcsin(cx))}{x}\\
&\quad+c^4d^2x(a+b\arcsin(cx))-\frac{1}{6}\left(bcd^2\right)\text{Subst}\left(\int\frac{-17+6x^2}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)
\end{aligned}$$

$$= bc^3d^2\sqrt{1-c^2x^2} - \frac{bcd^2\sqrt{1-c^2x^2}}{6x^2} - \frac{d^2(a+b\arcsin(cx))}{3x^3} + \frac{2c^2d^2(a+b\arcsin(cx))}{x} + c^4d^2x(a+b\arcsin(cx)) + \frac{1}{6}(11bcd^2)\,\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)$$

$$= bc^3d^2\sqrt{1-c^2x^2} - \frac{bcd^2\sqrt{1-c^2x^2}}{6x^2} - \frac{d^2(a+b\arcsin(cx))}{3x^3} + \frac{2c^2d^2(a+b\arcsin(cx))}{x} + c^4d^2x(a+b\arcsin(cx)) + \frac{11}{6}bc^3d^2\text{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.06

$$\int \frac{(d-c^2dx^2)^2\,(a+b\arcsin(cx))}{x^4}\,dx = \frac{d^2\left(-2a+12ac^2x^2+6ac^4x^4-bcx\sqrt{1-c^2x^2}+6bc^3x^3\sqrt{1-c^2x^2}+2b(-1+6c^2x^2+3c^4x^4)\arcsin(cx)-\right.}{6x^3}$$

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (d^2*(-2*a + 12*a*c^2*x^2 + 6*a*c^4*x^4 - b*c*x*Sqrt[1 - c^2*x^2] + 6*b*c^3
*x^3*Sqrt[1 - c^2*x^2] + 2*b*(-1 + 6*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x] - 11*
b*c^3*x^3*Log[x] + 11*b*c^3*x^3*Log[1 + Sqrt[1 - c^2*x^2]]))/(6*x^3)
```

Maple [A] (verified)

Time = 0.06 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.88

method	result
parts	$d^2a\left(c^4x+\frac{2c^2}{x}-\frac{1}{3x^3}\right)+d^2b\,c^3\left(cx\arcsin(cx)-\frac{\arcsin(cx)}{3c^3x^3}+\frac{2\arcsin(cx)}{cx}+\sqrt{-c^2x^2+1}-\right.$
derivativedivides	$c^3\left(d^2a\left(cx-\frac{1}{3c^3x^3}+\frac{2}{cx}\right)+d^2b\left(cx\arcsin(cx)-\frac{\arcsin(cx)}{3c^3x^3}+\frac{2\arcsin(cx)}{cx}+\sqrt{-c^2x^2+1}-\right.\right.$
default	$c^3\left(d^2a\left(cx-\frac{1}{3c^3x^3}+\frac{2}{cx}\right)+d^2b\left(cx\arcsin(cx)-\frac{\arcsin(cx)}{3c^3x^3}+\frac{2\arcsin(cx)}{cx}+\sqrt{-c^2x^2+1}-\right.\right.$

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] d^2*a*(c^4*x+2*c^2/x-1/3/x^3)+d^2*b*c^3*(c*x*arcsin(c*x)-1/3/c^3/x^3*arcsin
(c*x)+2/c/x*arcsin(c*x)+(-c^2*x^2+1)^(1/2)-1/6/c^2/x^2*(-c^2*x^2+1)^(1/2)+1
1/6*arctanh(1/(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.27

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^4}\,dx = \frac{12\,ac^4d^2x^4+11\,bc^3d^2x^3\log\left(\sqrt{-c^2x^2+1}+1\right)-11\,bc^3d^2x^3\log\left(\sqrt{-c^2x^2+1}-1\right)+24\,ac^2d^2x^2-4\,ad^2+4}{12\,x^3}$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] 1/12*(12*a*c^4*d^2*x^4 + 11*b*c^3*d^2*x^3*log(sqrt(-c^2*x^2 + 1) + 1) - 11*
b*c^3*d^2*x^3*log(sqrt(-c^2*x^2 + 1) - 1) + 24*a*c^2*d^2*x^2 - 4*a*d^2 + 4*
(3*b*c^4*d^2*x^4 + 6*b*c^2*d^2*x^2 - b*d^2)*arcsin(c*x) + 2*(6*b*c^3*d^2*x^
3 - b*c*d^2*x)*sqrt(-c^2*x^2 + 1))/x^3
```

Sympy [A] (verification not implemented)

Time = 3.22 (sec) , antiderivative size = 233, normalized size of antiderivative = 1.82

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))}{x^4}\,dx = ac^4d^2x+\frac{2ac^2d^2}{x}-\frac{ad^2}{3x^3}+bc^4d^2\left(\begin{cases}0 & \text{for } c=0\\ x\operatorname{asin}(cx)+\frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise}\end{cases}\right) - 2bc^3d^2\left(\begin{cases}-\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|}>1\\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right)+\frac{2bc^2d^2\operatorname{asin}(cx)}{x} + \frac{bcd^2\left(\begin{cases}-\frac{c^2\operatorname{acosh}\left(\frac{1}{cx}\right)}{2}+\frac{c}{2x\sqrt{-1+\frac{1}{c^2x^2}}}-\frac{1}{2cx^3\sqrt{-1+\frac{1}{c^2x^2}}} & \text{for } \frac{1}{|c^2x^2|}>1\\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx}\right)}{2}-\frac{ic\sqrt{1-\frac{1}{c^2x^2}}}{2x} & \text{otherwise}\end{cases}\right)}{3}-\frac{bd^2\operatorname{asin}(cx)}{3x^3}$$

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))/x**4,x)
```

```
[Out] a*c**4*d**2*x + 2*a*c**2*d**2/x - a*d**2/(3*x**3) + b*c**4*d**2*Piecewise((
0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True)) - 2*b*c**3*d**2
*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)
) + 2*b*c**2*d**2*asin(c*x)/x + b*c*d**2*Piecewise((-c**2*acosh(1/(c*x))/2
+ c/(2*x*sqrt(-1 + 1/(c**2*x**2))) - 1/(2*c*x**3*sqrt(-1 + 1/(c**2*x**2))),
 1/Abs(c**2*x**2) > 1), (I*c**2*asin(1/(c*x))/2 - I*c*sqrt(1 - 1/(c**2*x**2
))/(2*x), True))/3 - b*d**2*asin(c*x)/(3*x**3)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.33

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))}{x^4}\,dx$$
$$= ac^4d^2x + \left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bc^3d^2$$
$$+ 2\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\arcsin(cx)}{x}\right)bc^2d^2$$
$$- \frac{1}{6}\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\sqrt{-c^2x^2+1}}{x^2}\right)c + \frac{2\arcsin(cx)}{x^3}\right)bd^2$$
$$+ \frac{2\,ac^2d^2}{x} - \frac{ad^2}{3\,x^3}$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] a*c^4*d^2*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*c^3*d^2 + 2*(c*log(2
*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*c^2*d^2 - 1/6*((c
^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)/x^2)*c
+ 2*arcsin(c*x)/x^3)*b*d^2 + 2*a*c^2*d^2/x - 1/3*a*d^2/x^3
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1409 vs. 2(116) = 232.

Time = 59.12 (sec) , antiderivative size = 1409, normalized size of antiderivative = 11.01

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))}{x^4}\,dx = \text{Too large to display}$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] -1/24*b*c^11*d^2*x^8*arcsin(c*x)/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3
*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) - 1/24*a*c^11*
d^2*x^8/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1)
+ 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) + 1/24*b*c^10*d^2*x^7/((c^5*x^5/(sqrt(-
c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 +
1) + 1)^7) + 5/6*b*c^9*d^2*x^6*arcsin(c*x)/((c^5*x^5/(sqrt(-c^2*x^2 + 1) +
1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) + 5/
6*a*c^9*d^2*x^6/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x
^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) - 11/6*b*c^8*d^2*x^5*log(abs(c)
*abs(x))/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1)
```

```
 + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) + 11/6*b*c^8*d^2*x^5*log(sqrt(-c^2*x^2
 + 1) + 1)/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 +
1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) - 23/24*b*c^8*d^2*x^5/((c^5*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2
 + 1) + 1)^5) + 15/4*b*c^7*d^2*x^4*arcsin(c*x)/((c^5*x^5/(sqrt(-c^2*x^2 + 1
) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4)
+ 15/4*a*c^7*d^2*x^4/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) - 11/6*b*c^6*d^2*x^3*log(a
bs(c)*abs(x))/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2
 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) + 11/6*b*c^6*d^2*x^3*log(sqrt(-c^
2*x^2 + 1) + 1)/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x
^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) + 23/24*b*c^6*d^2*x^3/((c^5*x^5
/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^
2*x^2 + 1) + 1)^3) + 5/6*b*c^5*d^2*x^2*arcsin(c*x)/((c^5*x^5/(sqrt(-c^2*x^2
 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)
^2) + 5/6*a*c^5*d^2*x^2/((c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqr
t(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^2) - 1/24*b*c^4*d^2*x/((c^
5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqr
t(-c^2*x^2 + 1) + 1)) - 1/24*b*c^3*d^2*arcsin(c*x)/(c^5*x^5/(sqrt(-c^2*x^2
+ 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3) - 1/24*a*c^3*d^2/(c^5*x^5
/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))}{x^4} dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)^2}{x^4} dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x^4,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^2)/x^4, x)
```

3.19 $\int x^4(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 232

$$\int x^4(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx=\frac{16bd^3\sqrt{1-c^2x^2}}{1155c^5}+\frac{8bd^3(1-c^2x^2)^{3/2}}{3465c^5}+\frac{2bd^3(1-c^2x^2)^{5/2}}{1925c^5}+\frac{bd^3(1-c^2x^2)^{7/2}}{1617c^5}-\frac{4bd^3(1-c^2x^2)^{9/2}}{297c^5}+\frac{bd^3(1-c^2x^2)^{11/2}}{121c^5}+\frac{1}{5}d^3x^5(a+b\arcsin(cx))-\frac{3}{7}c^2d^3x^7(a+b\arcsin(cx))+\frac{1}{3}c^4d^3x^9(a+b\arcsin(cx))-\frac{1}{11}c^6d^3x^{11}(a+b\arcsin(c$$

```
[Out] 8/3465*b*d^3*(-c^2*x^2+1)^(3/2)/c^5+2/1925*b*d^3*(-c^2*x^2+1)^(5/2)/c^5+1/1
617*b*d^3*(-c^2*x^2+1)^(7/2)/c^5-4/297*b*d^3*(-c^2*x^2+1)^(9/2)/c^5+1/121*b
*d^3*(-c^2*x^2+1)^(11/2)/c^5+1/5*d^3*x^5*(a+b*arcsin(c*x))-3/7*c^2*d^3*x^7*
(a+b*arcsin(c*x))+1/3*c^4*d^3*x^9*(a+b*arcsin(c*x))-1/11*c^6*d^3*x^11*(a+b*
arcsin(c*x))+16/1155*b*d^3*(-c^2*x^2+1)^(1/2)/c^5
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 232, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {276, 4777, 12, 1813, 1634}

$$\int x^4 \left(d-c^2dx^2\right)^3 (a+b\arcsin(cx))\,dx = -\frac{1}{11}c^6d^3x^{11}(a+b\arcsin(cx)) + \frac{1}{3}c^4d^3x^9(a+b\arcsin(cx)) - \frac{3}{7}c^2d^3x^7(a+b\arcsin(cx)) + \frac{1}{5}d^3x^5(a+b\arcsin(cx)) + \frac{bd^3(1-c^2x^2)^{11/2}}{121c^5} - \frac{4bd^3(1-c^2x^2)^{9/2}}{297c^5} + \frac{bd^3(1-c^2x^2)^{7/2}}{1617c^5} + \frac{2bd^3(1-c^2x^2)^{5/2}}{1925c^5} + \frac{8bd^3(1-c^2x^2)^{3/2}}{3465c^5} + \frac{16bd^3\sqrt{1-c^2x^2}}{1155c^5}$$

```
[In] Int[x^4*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (16*b*d^3*Sqrt[1 - c^2*x^2])/(1155*c^5) + (8*b*d^3*(1 - c^2*x^2)^(3/2))/(34
65*c^5) + (2*b*d^3*(1 - c^2*x^2)^(5/2))/(1925*c^5) + (b*d^3*(1 - c^2*x^2)^(
7/2))/(1617*c^5) - (4*b*d^3*(1 - c^2*x^2)^(9/2))/(297*c^5) + (b*d^3*(1 - c^
2*x^2)^(11/2))/(121*c^5) + (d^3*x^5*(a + b*ArcSin[c*x]))/5 - (3*c^2*d^3*x^7
*(a + b*ArcSin[c*x]))/7 + (c^4*d^3*x^9*(a + b*ArcSin[c*x]))/3 - (c^6*d^3*x^
11*(a + b*ArcSin[c*x]))/11
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
```

```
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{1}{5}d^3x^5(a+b\arcsin(cx)) - \frac{3}{7}c^2d^3x^7(a+b\arcsin(cx)) \\ &\quad + \frac{1}{3}c^4d^3x^9(a+b\arcsin(cx)) - \frac{1}{11}c^6d^3x^{11}(a+b\arcsin(cx)) \\ &\quad - (bc)\int \frac{d^3x^5(231-495c^2x^2+385c^4x^4-105c^6x^6)}{1155\sqrt{1-c^2x^2}}\,dx \\ &= \frac{1}{5}d^3x^5(a+b\arcsin(cx)) - \frac{3}{7}c^2d^3x^7(a+b\arcsin(cx)) + \frac{1}{3}c^4d^3x^9(a+b\arcsin(cx)) \\ &\quad - \frac{1}{11}c^6d^3x^{11}(a+b\arcsin(cx)) - \frac{(bcd^3)\int \frac{x^5(231-495c^2x^2+385c^4x^4-105c^6x^6)}{\sqrt{1-c^2x^2}}\,dx}{1155} \\ &= \frac{1}{5}d^3x^5(a+b\arcsin(cx)) - \frac{3}{7}c^2d^3x^7(a+b\arcsin(cx)) + \frac{1}{3}c^4d^3x^9(a+b\arcsin(cx)) \\ &\quad - \frac{1}{11}c^6d^3x^{11}(a+b\arcsin(cx)) - \frac{(bcd^3)\,\text{Subst}\left(\int \frac{x^2(231-495c^2x+385c^4x^2-105c^6x^3)}{\sqrt{1-c^2x}}\,dx, x, x^2\right)}{2310} \\ &= \frac{1}{5}d^3x^5(a+b\arcsin(cx)) - \frac{3}{7}c^2d^3x^7(a+b\arcsin(cx)) \\ &\quad + \frac{1}{3}c^4d^3x^9(a+b\arcsin(cx)) - \frac{1}{11}c^6d^3x^{11}(a+b\arcsin(cx)) \\ &\quad - \frac{(bcd^3)\,\text{Subst}\left(\int \left(\frac{16}{c^4\sqrt{1-c^2x}} + \frac{8\sqrt{1-c^2x}}{c^4} + \frac{6(1-c^2x)^{3/2}}{c^4} + \frac{5(1-c^2x)^{5/2}}{c^4} - \frac{140(1-c^2x)^{7/2}}{c^4} + \frac{105(1-c^2x)^{9/2}}{c^4}\right) d\right.}{2310}\end{aligned}$$

$$
\begin{aligned}
&= \frac{16bd^3\sqrt{1-c^2x^2}}{1155c^5} + \frac{8bd^3(1-c^2x^2)^{3/2}}{3465c^5} + \frac{2bd^3(1-c^2x^2)^{5/2}}{1925c^5} \\
&+ \frac{bd^3(1-c^2x^2)^{7/2}}{1617c^5} - \frac{4bd^3(1-c^2x^2)^{9/2}}{297c^5} + \frac{bd^3(1-c^2x^2)^{11/2}}{121c^5} \\
&+ \frac{1}{5}d^3x^5(a+b\arcsin(cx)) - \frac{3}{7}c^2d^3x^7(a+b\arcsin(cx)) + \frac{1}{3}c^4d^3x^9(a+b\arcsin(cx)) - \frac{1}{11}c^6d^3x^{11}(a+b\,\text{ar}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 143, normalized size of antiderivative = 0.62

$$
\int x^4(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx
= \frac{d^3(-3465ac^5x^5(-231+495c^2x^2-385c^4x^4+105c^6x^6)+b\sqrt{1-c^2x^2}(50488+25244c^2x^2+18933c^4x^4-1}{40020}
$$

```
[In] Integrate[x^4*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^3*(-3465*a*c^5*x^5*(-231 + 495*c^2*x^2 - 385*c^4*x^4 + 105*c^6*x^6) + b*
Sqrt[1 - c^2*x^2]*(50488 + 25244*c^2*x^2 + 18933*c^4*x^4 - 117625*c^6*x^6 +
 111475*c^8*x^8 - 33075*c^10*x^10) - 3465*b*c^5*x^5*(-231 + 495*c^2*x^2 - 3
85*c^4*x^4 + 105*c^6*x^6)*ArcSin[c*x]))/(4002075*c^5)
```

Maple [A] (verified)

Time = 0.09 (sec) , antiderivative size = 210, normalized size of antiderivative = 0.91

method	result
parts	$-d^3a\left(\frac{1}{11}c^6x^{11}-\frac{1}{3}c^4x^9+\frac{3}{7}c^2x^7-\frac{1}{5}x^5\right)-\frac{d^3b\left(\frac{\arcsin(cx)c^{11}x^{11}}{11}-\frac{\arcsin(cx)c^9x^9}{3}+\frac{3\arcsin(cx)c^7x^7}{7}-\frac{\arcsin(c}{5}\right.}{}$
derivativedivides	$\frac{-d^3a\left(\frac{1}{11}c^{11}x^{11}-\frac{1}{3}c^9x^9+\frac{3}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-d^3b\left(\frac{\arcsin(cx)c^{11}x^{11}}{11}-\frac{\arcsin(cx)c^9x^9}{3}+\frac{3\arcsin(cx)c^7x^7}{7}-\frac{\arcsin(cx)c^5x^5}{5}-\frac{91c^8x}{}\right.}{c^5}$
default	$\frac{-d^3a\left(\frac{1}{11}c^{11}x^{11}-\frac{1}{3}c^9x^9+\frac{3}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-d^3b\left(\frac{\arcsin(cx)c^{11}x^{11}}{11}-\frac{\arcsin(cx)c^9x^9}{3}+\frac{3\arcsin(cx)c^7x^7}{7}-\frac{\arcsin(cx)c^5x^5}{5}-\frac{91c^8x}{}\right.}{c^5}$

```
[In] int(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -d^3*a*(1/11*c^6*x^11-1/3*c^4*x^9+3/7*c^2*x^7-1/5*x^5)-d^3*b/c^5*(1/11*arcs
in(c*x)*c^11*x^11-1/3*arcsin(c*x)*c^9*x^9+3/7*arcsin(c*x)*c^7*x^7-1/5*arcsi
n(c*x)*c^5*x^5-91/3267*c^8*x^8*(-c^2*x^2+1)^(1/2)+4705/160083*c^6*x^6*(-c^2
*x^2+1)^(1/2)-6311/1334025*c^4*x^4*(-c^2*x^2+1)^(1/2)-25244/4002075*c^2*x^2
*(-c^2*x^2+1)^(1/2)-50488/4002075*(-c^2*x^2+1)^(1/2)+1/121*c^10*x^10*(-c^2*
x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 189, normalized size of antiderivative = 0.81

$$\int x^4(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx =$$
$$-\frac{363825\,ac^{11}d^3x^{11}-1334025\,ac^9d^3x^9+1715175\,ac^7d^3x^7-800415\,ac^5d^3x^5+3465\,(105\,bc^{11}d^3x^{11}-385}{}$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/4002075*(363825*a*c^11*d^3*x^11 - 1334025*a*c^9*d^3*x^9 + 1715175*a*c^7*
d^3*x^7 - 800415*a*c^5*d^3*x^5 + 3465*(105*b*c^11*d^3*x^11 - 385*b*c^9*d^3*
x^9 + 495*b*c^7*d^3*x^7 - 231*b*c^5*d^3*x^5)*arcsin(c*x) + (33075*b*c^10*d^
3*x^10 - 111475*b*c^8*d^3*x^8 + 117625*b*c^6*d^3*x^6 - 18933*b*c^4*d^3*x^4
- 25244*b*c^2*d^3*x^2 - 50488*b*d^3)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] (verification not implemented)

Time = 2.16 (sec) , antiderivative size = 289, normalized size of antiderivative = 1.25

$$\int x^4(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx$$
$$=\begin{cases}-\frac{ac^6d^3x^{11}}{11}+\frac{ac^4d^3x^9}{3}-\frac{3ac^2d^3x^7}{7}+\frac{ad^3x^5}{5}-\frac{bc^6d^3x^{11}\operatorname{asin}(cx)}{11}-\frac{bc^5d^3x^{10}\sqrt{-c^2x^2+1}}{121}+\frac{bc^4d^3x^9\operatorname{asin}(cx)}{3}+\frac{91bc^3d^3x^8\sqrt{-c^2x}}{3267} \\ \frac{ad^3x^5}{5}\end{cases}$$

```
[In] integrate(x**4*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**11/11 + a*c**4*d**3*x**9/3 - 3*a*c**2*d**3*x**7/
7 + a*d**3*x**5/5 - b*c**6*d**3*x**11*asin(c*x)/11 - b*c**5*d**3*x**10*sqrt
(-c**2*x**2 + 1)/121 + b*c**4*d**3*x**9*asin(c*x)/3 + 91*b*c**3*d**3*x**8*s
qrt(-c**2*x**2 + 1)/3267 - 3*b*c**2*d**3*x**7*asin(c*x)/7 - 4705*b*c*d**3*x
**6*sqrt(-c**2*x**2 + 1)/160083 + b*d**3*x**5*asin(c*x)/5 + 6311*b*d**3*x**
4*sqrt(-c**2*x**2 + 1)/(1334025*c) + 25244*b*d**3*x**2*sqrt(-c**2*x**2 + 1)
/(4002075*c**3) + 50488*b*d**3*sqrt(-c**2*x**2 + 1)/(4002075*c**5), Ne(c, 0
)), (a*d**3*x**5/5, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 479 vs. 2(200) = 400.

Time = 0.31 (sec) , antiderivative size = 479, normalized size of antiderivative = 2.06

$$\int x^4 (d - c^2 dx^2)^3 (a + b \arcsin(cx))\, dx = -\frac{1}{11}\, ac^6 d^3 x^{11} + \frac{1}{3}\, ac^4 d^3 x^9 - \frac{3}{7}\, ac^2 d^3 x^7$$

$$-\frac{1}{7623}\left(693\, x^{11} \arcsin(cx) + \left(\frac{63\sqrt{-c^2x^2+1}x^{10}}{c^2} + \frac{70\sqrt{-c^2x^2+1}x^8}{c^4} + \frac{80\sqrt{-c^2x^2+1}x^6}{c^6} + \frac{96\sqrt{-c^2x^2}}{c^8}\right.\right.$$

$$+\frac{1}{945}\left(315\, x^9 \arcsin(cx) + \left(\frac{35\sqrt{-c^2x^2+1}x^8}{c^2} + \frac{40\sqrt{-c^2x^2+1}x^6}{c^4} + \frac{48\sqrt{-c^2x^2+1}x^4}{c^6} + \frac{64\sqrt{-c^2x^2+}}{c^8}\right.\right.$$

$$+\frac{1}{5}\, ad^3 x^5$$

$$-\frac{3}{245}\left(35\, x^7 \arcsin(cx) + \left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2} + \frac{6\sqrt{-c^2x^2+1}x^4}{c^4} + \frac{8\sqrt{-c^2x^2+1}x^2}{c^6} + \frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right.$$

$$+\frac{1}{75}\left(15\, x^5 \arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd^3$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/11*a*c^6*d^3*x^11 + 1/3*a*c^4*d^3*x^9 - 3/7*a*c^2*d^3*x^7 - 1/7623*(693*
x^11*arcsin(c*x) + (63*sqrt(-c^2*x^2 + 1)*x^10/c^2 + 70*sqrt(-c^2*x^2 + 1)*
x^8/c^4 + 80*sqrt(-c^2*x^2 + 1)*x^6/c^6 + 96*sqrt(-c^2*x^2 + 1)*x^4/c^8 + 1
28*sqrt(-c^2*x^2 + 1)*x^2/c^10 + 256*sqrt(-c^2*x^2 + 1)/c^12)*c)*b*c^6*d^3
+ 1/945*(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^
2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*
x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*b*c^4*d^3 + 1/5*a*d^3*x^5 - 3/245
*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)
*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c
^2*d^3 + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(
-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d^3
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 353, normalized size of antiderivative = 1.52

$$\int x^4(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx = -\frac{1}{11}ac^6d^3x^{11}+\frac{1}{3}ac^4d^3x^9-\frac{3}{7}ac^2d^3x^7+\frac{1}{5}ad^3x^5-\frac{(c^2x^2-1)^5bd^3x\arcsin(cx)}{11\,c^4}-\frac{4\,(c^2x^2-1)^4bd^3x\arcsin(cx)}{33\,c^4}-\frac{(c^2x^2-1)^3bd^3x\arcsin(cx)}{231\,c^4}-\frac{(c^2x^2-1)^5\sqrt{-c^2x^2+1}bd^3}{121\,c^5}+\frac{2\,(c^2x^2-1)^2bd^3x\arcsin(cx)}{385\,c^4}-\frac{4\,(c^2x^2-1)^4\sqrt{-c^2x^2+1}bd^3}{297\,c^5}-\frac{8\,(c^2x^2-1)bd^3x\arcsin(cx)}{1155\,c^4}-\frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}bd^3}{1617\,c^5}+\frac{16\,bd^3x\arcsin(cx)}{1155\,c^4}+\frac{2\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}bd^3}{1925\,c^5}+\frac{8\,(-c^2x^2+1)^{\frac{3}{2}}bd^3}{3465\,c^5}+\frac{16\,\sqrt{-c^2x^2+1}bd^3}{1155\,c^5}$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/11*a*c^6*d^3*x^11 + 1/3*a*c^4*d^3*x^9 - 3/7*a*c^2*d^3*x^7 + 1/5*a*d^3*x^
5 - 1/11*(c^2*x^2 - 1)^5*b*d^3*x*arcsin(c*x)/c^4 - 4/33*(c^2*x^2 - 1)^4*b*d
^3*x*arcsin(c*x)/c^4 - 1/231*(c^2*x^2 - 1)^3*b*d^3*x*arcsin(c*x)/c^4 - 1/12
1*(c^2*x^2 - 1)^5*sqrt(-c^2*x^2 + 1)*b*d^3/c^5 + 2/385*(c^2*x^2 - 1)^2*b*d^
3*x*arcsin(c*x)/c^4 - 4/297*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*d^3/c^5 -
8/1155*(c^2*x^2 - 1)*b*d^3*x*arcsin(c*x)/c^4 - 1/1617*(c^2*x^2 - 1)^3*sqrt(
-c^2*x^2 + 1)*b*d^3/c^5 + 16/1155*b*d^3*x*arcsin(c*x)/c^4 + 2/1925*(c^2*x^2
 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^3/c^5 + 8/3465*(-c^2*x^2 + 1)^(3/2)*b*d^3/c^
5 + 16/1155*sqrt(-c^2*x^2 + 1)*b*d^3/c^5
```

Mupad [F(-1)]

Timed out.

$$\int x^4 (d-c^2dx^2)^3 (a+b\arcsin(cx))\,dx=\int x^4\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^3\,dx$$

```
[In] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^3,x)
[Out] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^3, x)
```

3.20 $\int x^3(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 206

$$\int x^3(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx=\frac{49bd^3x\sqrt{1-c^2x^2}}{5120c^3}+\frac{49bd^3x(1-c^2x^2)^{3/2}}{7680c^3}+\frac{49bd^3x(1-c^2x^2)^{5/2}}{9600c^3}+\frac{7bd^3x(1-c^2x^2)^{7/2}}{1600c^3}-\frac{bd^3x(1-c^2x^2)^{9/2}}{100c^3}+\frac{49bd^3\arcsin(cx)}{5120c^4}-\frac{d^3(1-c^2x^2)^4(a+b\arcsin(cx))}{8c^4}+\frac{d^3(1-c^2x^2)^5(a+b\arcsin(cx))}{10c^4}$$

```
[Out] 49/7680*b*d^3*x*(-c^2*x^2+1)^(3/2)/c^3+49/9600*b*d^3*x*(-c^2*x^2+1)^(5/2)/c
^3+7/1600*b*d^3*x*(-c^2*x^2+1)^(7/2)/c^3-1/100*b*d^3*x*(-c^2*x^2+1)^(9/2)/c
^3+49/5120*b*d^3*arcsin(c*x)/c^4-1/8*d^3*(-c^2*x^2+1)^4*(a+b*arcsin(c*x))/c
^4+1/10*d^3*(-c^2*x^2+1)^5*(a+b*arcsin(c*x))/c^4+49/5120*b*d^3*x*(-c^2*x^2+
1)^(1/2)/c^3
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used

= {272, 45, 4777, 12, 396, 201, 222}

$$\int x^3(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx = \frac{d^3(1-c^2x^2)^5(a+b\arcsin(cx))}{10c^4} - \frac{d^3(1-c^2x^2)^4(a+b\arcsin(cx))}{8c^4} + \frac{49bd^3\arcsin(cx)}{5120c^4} - \frac{bd^3x(1-c^2x^2)^{9/2}}{100c^3} + \frac{7bd^3x(1-c^2x^2)^{7/2}}{1600c^3} + \frac{49bd^3x(1-c^2x^2)^{5/2}}{9600c^3} + \frac{49bd^3x(1-c^2x^2)^{3/2}}{7680c^3} + \frac{49bd^3x\sqrt{1-c^2x^2}}{5120c^3}$$

```
[In] Int[x^3*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (49*b*d^3*x*Sqrt[1 - c^2*x^2])/(5120*c^3) + (49*b*d^3*x*(1 - c^2*x^2)^(3/2)
)/(7680*c^3) + (49*b*d^3*x*(1 - c^2*x^2)^(5/2))/(9600*c^3) + (7*b*d^3*x*(1
- c^2*x^2)^(7/2))/(1600*c^3) - (b*d^3*x*(1 - c^2*x^2)^(9/2))/(100*c^3) + (4
9*b*d^3*ArcSin[c*x])/(5120*c^4) - (d^3*(1 - c^2*x^2)^4*(a + b*ArcSin[c*x]))
/(8*c^4) + (d^3*(1 - c^2*x^2)^5*(a + b*ArcSin[c*x]))/(10*c^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^3(1-c^2x^2)^4\,(a+b\arcsin(cx))}{8c^4}+\frac{d^3(1-c^2x^2)^5\,(a+b\arcsin(cx))}{10c^4} \\
&\quad -(bc)\int \frac{d^3(-1-4c^2x^2)\,(1-c^2x^2)^{7/2}}{40c^4}\,dx \\
&= -\frac{d^3(1-c^2x^2)^4\,(a+b\arcsin(cx))}{8c^4}+\frac{d^3(1-c^2x^2)^5\,(a+b\arcsin(cx))}{10c^4} \\
&\quad -\frac{(bd^3)\int(-1-4c^2x^2)\,(1-c^2x^2)^{7/2}\,dx}{40c^3} \\
&= -\frac{bd^3x(1-c^2x^2)^{9/2}}{100c^3}-\frac{d^3(1-c^2x^2)^4\,(a+b\arcsin(cx))}{8c^4} \\
&\quad +\frac{d^3(1-c^2x^2)^5\,(a+b\arcsin(cx))}{10c^4}+\frac{(7bd^3)\int(1-c^2x^2)^{7/2}\,dx}{200c^3} \\
&= \frac{7bd^3x(1-c^2x^2)^{7/2}}{1600c^3}-\frac{bd^3x(1-c^2x^2)^{9/2}}{100c^3}-\frac{d^3(1-c^2x^2)^4\,(a+b\arcsin(cx))}{8c^4} \\
&\quad +\frac{d^3(1-c^2x^2)^5\,(a+b\arcsin(cx))}{10c^4}+\frac{(49bd^3)\int(1-c^2x^2)^{5/2}\,dx}{1600c^3}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{49bd^3x(1-c^2x^2)^{5/2}}{9600c^3} + \frac{7bd^3x(1-c^2x^2)^{7/2}}{1600c^3} \\
&\quad - \frac{bd^3x(1-c^2x^2)^{9/2}}{100c^3} - \frac{d^3(1-c^2x^2)^4(a+b\arcsin(cx))}{8c^4} \\
&\quad + \frac{d^3(1-c^2x^2)^5(a+b\arcsin(cx))}{10c^4} + \frac{(49bd^3)\int(1-c^2x^2)^{3/2}\,dx}{1920c^3} \\
&= \frac{49bd^3x(1-c^2x^2)^{3/2}}{7680c^3} + \frac{49bd^3x(1-c^2x^2)^{5/2}}{9600c^3} + \frac{7bd^3x(1-c^2x^2)^{7/2}}{1600c^3} \\
&\quad - \frac{bd^3x(1-c^2x^2)^{9/2}}{100c^3} - \frac{d^3(1-c^2x^2)^4(a+b\arcsin(cx))}{8c^4} \\
&\quad + \frac{d^3(1-c^2x^2)^5(a+b\arcsin(cx))}{10c^4} + \frac{(49bd^3)\int\sqrt{1-c^2x^2}\,dx}{2560c^3} \\
&= \frac{49bd^3x\sqrt{1-c^2x^2}}{5120c^3} + \frac{49bd^3x(1-c^2x^2)^{3/2}}{7680c^3} + \frac{49bd^3x(1-c^2x^2)^{5/2}}{9600c^3} \\
&\quad + \frac{7bd^3x(1-c^2x^2)^{7/2}}{1600c^3} - \frac{bd^3x(1-c^2x^2)^{9/2}}{100c^3} - \frac{d^3(1-c^2x^2)^4(a+b\arcsin(cx))}{8c^4} \\
&\quad + \frac{d^3(1-c^2x^2)^5(a+b\arcsin(cx))}{10c^4} + \frac{(49bd^3)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{5120c^3} \\
&= \frac{49bd^3x\sqrt{1-c^2x^2}}{5120c^3} + \frac{49bd^3x(1-c^2x^2)^{3/2}}{7680c^3} + \frac{49bd^3x(1-c^2x^2)^{5/2}}{9600c^3} \\
&\quad + \frac{7bd^3x(1-c^2x^2)^{7/2}}{1600c^3} - \frac{bd^3x(1-c^2x^2)^{9/2}}{100c^3} + \frac{49bd^3\arcsin(cx)}{5120c^4} \\
&\quad - \frac{d^3(1-c^2x^2)^4(a+b\arcsin(cx))}{8c^4} + \frac{d^3(1-c^2x^2)^5(a+b\arcsin(cx))}{10c^4}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 139, normalized size of antiderivative = 0.67

$$
\int x^3\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))\,dx
$$

$$
= \frac{d^3\left(-1920ac^4x^4(-10+20c^2x^2-15c^4x^4+4c^6x^6)+bcx\sqrt{1-c^2x^2}(1185+790c^2x^2-3208c^4x^4+2736c^6x^6\right.}{76800c^4}
$$

```
[In] Integrate[x^3*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^3*(-1920*a*c^4*x^4*(-10 + 20*c^2*x^2 - 15*c^4*x^4 + 4*c^6*x^6) + b*c*x*S
qrt[1 - c^2*x^2]*(1185 + 790*c^2*x^2 - 3208*c^4*x^4 + 2736*c^6*x^6 - 768*c^
8*x^8) - 15*b*(79 - 1280*c^4*x^4 + 2560*c^6*x^6 - 1920*c^8*x^8 + 512*c^10*x
^10)*ArcSin[c*x]))/(76800*c^4)
```

Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 198, normalized size of antiderivative = 0.96

method	result
parts	$-d^3a\left(\frac{1}{10}c^6x^{10}-\frac{3}{8}c^4x^8+\frac{1}{2}c^2x^6-\frac{1}{4}x^4\right)-\frac{d^3b\left(\frac{\arcsin(cx)c^{10}x^{10}}{10}-\frac{3\arcsin(cx)c^8x^8}{8}+\frac{\arcsin(cx)c^6x^6}{2}-\frac{c^4x^4 a}{}\right.}{}$
derivativedivides	$\frac{-d^3a\left(\frac{1}{10}c^{10}x^{10}-\frac{3}{8}c^8x^8+\frac{1}{2}c^6x^6-\frac{1}{4}c^4x^4\right)-d^3b\left(\frac{\arcsin(cx)c^{10}x^{10}}{10}-\frac{3\arcsin(cx)c^8x^8}{8}+\frac{\arcsin(cx)c^6x^6}{2}-\frac{c^4x^4\arcsin(cx)}{4}+\frac{c^9x}{}\right.}{c^4}$
default	$\frac{-d^3a\left(\frac{1}{10}c^{10}x^{10}-\frac{3}{8}c^8x^8+\frac{1}{2}c^6x^6-\frac{1}{4}c^4x^4\right)-d^3b\left(\frac{\arcsin(cx)c^{10}x^{10}}{10}-\frac{3\arcsin(cx)c^8x^8}{8}+\frac{\arcsin(cx)c^6x^6}{2}-\frac{c^4x^4\arcsin(cx)}{4}+\frac{c^9x}{}\right.}{c^4}$

```
[In] int(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -d^3*a*(1/10*c^6*x^10-3/8*c^4*x^8+1/2*c^2*x^6-1/4*x^4)-d^3*b/c^4*(1/10*arcs
in(c*x)*c^10*x^10-3/8*arcsin(c*x)*c^8*x^8+1/2*arcsin(c*x)*c^6*x^6-1/4*c^4*x
^4*arcsin(c*x)+1/100*c^9*x^9*(-c^2*x^2+1)^(1/2)-57/1600*c^7*x^7*(-c^2*x^2+1
)^(1/2)+401/9600*c^5*x^5*(-c^2*x^2+1)^(1/2)-79/7680*c^3*x^3*(-c^2*x^2+1)^(1
/2)-79/5120*c*x*(-c^2*x^2+1)^(1/2)+79/5120*arcsin(c*x))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 185, normalized size of antiderivative = 0.90

$$\int x^3\left(d-c^2dx^2\right)^3\left(a+b\arcsin(cx)\right)dx = -\frac{7680\,ac^{10}d^3x^{10}-28800\,ac^8d^3x^8+38400\,ac^6d^3x^6-19200\,ac^4d^3x^4+15\,(512\,bc^{10}d^3x^{10}-1920\,bc^8d^3x^8+}{}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/76800*(7680*a*c^10*d^3*x^10 - 28800*a*c^8*d^3*x^8 + 38400*a*c^6*d^3*x^6
- 19200*a*c^4*d^3*x^4 + 15*(512*b*c^10*d^3*x^10 - 1920*b*c^8*d^3*x^8 + 2560
*b*c^6*d^3*x^6 - 1280*b*c^4*d^3*x^4 + 79*b*d^3)*arcsin(c*x) + (768*b*c^9*d^
3*x^9 - 2736*b*c^7*d^3*x^7 + 3208*b*c^5*d^3*x^5 - 790*b*c^3*d^3*x^3 - 1185*
b*c*d^3*x)*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [A] (verification not implemented)

Time = 1.53 (sec) , antiderivative size = 280, normalized size of antiderivative = 1.36

$$\int x^3 (d - c^2dx^2)^3 (a + b \arcsin(cx))\, dx$$
$$= \begin{cases} -\frac{ac^6d^3x^{10}}{10} + \frac{3ac^4d^3x^8}{8} - \frac{ac^2d^3x^6}{2} + \frac{ad^3x^4}{4} - \frac{bc^6d^3x^{10}\operatorname{asin}(cx)}{10} - \frac{bc^5d^3x^9\sqrt{-c^2x^2+1}}{100} + \frac{3bc^4d^3x^8\operatorname{asin}(cx)}{8} + \frac{57bc^3d^3x^7\sqrt{-c^2x^2+1}}{1600} \\ \frac{ad^3x^4}{4} \end{cases}$$

```
[In] integrate(x**3*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**10/10 + 3*a*c**4*d**3*x**8/8 - a*c**2*d**3*x**6/
2 + a*d**3*x**4/4 - b*c**6*d**3*x**10*asin(c*x)/10 - b*c**5*d**3*x**9*sqrt(
-c**2*x**2 + 1)/100 + 3*b*c**4*d**3*x**8*asin(c*x)/8 + 57*b*c**3*d**3*x**7*
sqrt(-c**2*x**2 + 1)/1600 - b*c**2*d**3*x**6*asin(c*x)/2 - 401*b*c*d**3*x**
5*sqrt(-c**2*x**2 + 1)/9600 + b*d**3*x**4*asin(c*x)/4 + 79*b*d**3*x**3*sqrt
(-c**2*x**2 + 1)/(7680*c) + 79*b*d**3*x*sqrt(-c**2*x**2 + 1)/(5120*c**3) -
79*b*d**3*asin(c*x)/(5120*c**4), Ne(c, 0)), (a*d**3*x**4/4, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 439 vs. 2(178) = 356.

Time = 0.30 (sec) , antiderivative size = 439, normalized size of antiderivative = 2.13

$$\int x^3 (d - c^2dx^2)^3 (a + b \arcsin(cx))\, dx = -\frac{1}{10}ac^6d^3x^{10} + \frac{3}{8}ac^4d^3x^8 - \frac{1}{2}ac^2d^3x^6$$
$$- \frac{1}{12800}\left(1280\, x^{10}\arcsin(cx) + \left(\frac{128\sqrt{-c^2x^2+1}x^9}{c^2} + \frac{144\sqrt{-c^2x^2+1}x^7}{c^4} + \frac{168\sqrt{-c^2x^2+1}x^5}{c^6} + \frac{210\sqrt{}}{}\right.\right.$$
$$+ \frac{1}{1024}\left(384\, x^8\arcsin(cx) + \left(\frac{48\sqrt{-c^2x^2+1}x^7}{c^2} + \frac{56\sqrt{-c^2x^2+1}x^5}{c^4} + \frac{70\sqrt{-c^2x^2+1}x^3}{c^6} + \frac{105\sqrt{-c^2x^2}}{c^8}\right.\right.$$
$$+ \frac{1}{4}ad^3x^4$$
$$- \frac{1}{96}\left(48\, x^6\arcsin(cx) + \left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2} + \frac{10\sqrt{-c^2x^2+1}x^3}{c^4} + \frac{15\sqrt{-c^2x^2+1}x}{c^6} - \frac{15\arcsin(cx)}{c^7}\right)c\right)$$
$$+ \frac{1}{32}\left(8\, x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bd^3$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/10*a*c^6*d^3*x^10 + 3/8*a*c^4*d^3*x^8 - 1/2*a*c^2*d^3*x^6 - 1/12800*(128
0*x^10*arcsin(c*x) + (128*sqrt(-c^2*x^2 + 1)*x^9/c^2 + 144*sqrt(-c^2*x^2 +
```

```
1)*x^7/c^4 + 168*sqrt(-c^2*x^2 + 1)*x^5/c^6 + 210*sqrt(-c^2*x^2 + 1)*x^3/c^
8 + 315*sqrt(-c^2*x^2 + 1)*x/c^10 - 315*arcsin(c*x)/c^11)*c)*b*c^6*d^3 + 1/
1024*(384*x^8*arcsin(c*x) + (48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x
^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/
c^8 - 105*arcsin(c*x)/c^9)*c)*b*c^4*d^3 + 1/4*a*d^3*x^4 - 1/96*(48*x^6*arcs
in(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 1
5*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*c^2*d^3 + 1/32*(8*x^4
*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 -
 3*arcsin(c*x)/c^5)*c)*b*d^3
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.21

$$\int x^3\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))\,dx = -\frac{1}{10}\,ac^6d^3x^{10}+\frac{3}{8}\,ac^4d^3x^8-\frac{1}{2}\,ac^2d^3x^6+\frac{1}{4}\,ad^3x^4-\frac{\left(c^2x^2-1\right)^4\sqrt{-c^2x^2+1}bd^3x}{100\,c^3}-\frac{\left(c^2x^2-1\right)^5bd^3\arcsin\left(cx\right)}{10\,c^4}-\frac{7\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}bd^3x}{1600\,c^3}-\frac{\left(c^2x^2-1\right)^4bd^3\arcsin\left(cx\right)}{8\,c^4}+\frac{49\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}bd^3x}{9600\,c^3}+\frac{49\left(-c^2x^2+1\right)^{\frac{3}{2}}bd^3x}{7680\,c^3}+\frac{49\sqrt{-c^2x^2+1}bd^3x}{5120\,c^3}+\frac{49\,bd^3\arcsin\left(cx\right)}{5120\,c^4}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/10*a*c^6*d^3*x^10 + 3/8*a*c^4*d^3*x^8 - 1/2*a*c^2*d^3*x^6 + 1/4*a*d^3*x^
4 - 1/100*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*d^3*x/c^3 - 1/10*(c^2*x^2 -
1)^5*b*d^3*arcsin(c*x)/c^4 - 7/1600*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d^
3*x/c^3 - 1/8*(c^2*x^2 - 1)^4*b*d^3*arcsin(c*x)/c^4 + 49/9600*(c^2*x^2 - 1)
^2*sqrt(-c^2*x^2 + 1)*b*d^3*x/c^3 + 49/7680*(-c^2*x^2 + 1)^(3/2)*b*d^3*x/c^
3 + 49/5120*sqrt(-c^2*x^2 + 1)*b*d^3*x/c^3 + 49/5120*b*d^3*arcsin(c*x)/c^4
```

Mupad [F(-1)]

Timed out.

$$\int x^3 (d - c^2 d x^2)^3 (a + b \arcsin(cx))\, dx = \int x^3 (a + b \operatorname{asin}(c\, x)) \left(d - c^2\, d\, x^2\right)^3 dx$$

```
[In] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^3,x)
[Out] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^3, x)
```

3.21 $\int x^2(d-c^2dx^2)^3 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 207

$$\int x^2(d-c^2dx^2)^3 (a+b\arcsin(cx))\,dx = \frac{16bd^3\sqrt{1-c^2x^2}}{315c^3} + \frac{8bd^3(1-c^2x^2)^{3/2}}{945c^3} + \frac{2bd^3(1-c^2x^2)^{5/2}}{525c^3} + \frac{bd^3(1-c^2x^2)^{7/2}}{441c^3} - \frac{bd^3(1-c^2x^2)^{9/2}}{81c^3} + \frac{1}{3}d^3x^3(a+b\arcsin(cx)) - \frac{3}{5}c^2d^3x^5(a+b\arcsin(cx)) + \frac{3}{7}c^4d^3x^7(a+b\arcsin(cx)) - \frac{1}{9}c^6d^3x^9(a+b\arcsin(cx))$$

```
[Out] 8/945*b*d^3*(-c^2*x^2+1)^(3/2)/c^3+2/525*b*d^3*(-c^2*x^2+1)^(5/2)/c^3+1/441
*b*d^3*(-c^2*x^2+1)^(7/2)/c^3-1/81*b*d^3*(-c^2*x^2+1)^(9/2)/c^3+1/3*d^3*x^3
*(a+b*arcsin(c*x))-3/5*c^2*d^3*x^5*(a+b*arcsin(c*x))+3/7*c^4*d^3*x^7*(a+b*a
rcsin(c*x))-1/9*c^6*d^3*x^9*(a+b*arcsin(c*x))+16/315*b*d^3*(-c^2*x^2+1)^(1/
2)/c^3
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {276, 4777, 12, 1813, 1634}

$$\int x^2\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))\,dx=-\frac{1}{9}c^6d^3x^9(a+b\arcsin(cx))+\frac{3}{7}c^4d^3x^7(a+b\arcsin(cx))-\frac{3}{5}c^2d^3x^5(a+b\arcsin(cx))+\frac{1}{3}d^3x^3(a+b\arcsin(cx))-\frac{bd^3\left(1-c^2x^2\right)^{9/2}}{81c^3}+\frac{bd^3\left(1-c^2x^2\right)^{7/2}}{441c^3}+\frac{2bd^3\left(1-c^2x^2\right)^{5/2}}{525c^3}+\frac{8bd^3\left(1-c^2x^2\right)^{3/2}}{945c^3}+\frac{16bd^3\sqrt{1-c^2x^2}}{315c^3}$$

```
[In] Int[x^2*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (16*b*d^3*Sqrt[1 - c^2*x^2])/(315*c^3) + (8*b*d^3*(1 - c^2*x^2)^(3/2))/(945
*c^3) + (2*b*d^3*(1 - c^2*x^2)^(5/2))/(525*c^3) + (b*d^3*(1 - c^2*x^2)^(7/2
))/(441*c^3) - (b*d^3*(1 - c^2*x^2)^(9/2))/(81*c^3) + (d^3*x^3*(a + b*ArcSi
n[c*x]))/3 - (3*c^2*d^3*x^5*(a + b*ArcSin[c*x]))/5 + (3*c^4*d^3*x^7*(a + b*
ArcSin[c*x]))/7 - (c^6*d^3*x^9*(a + b*ArcSin[c*x]))/9
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{3}d^3x^3(a+b\arcsin(cx))-\frac{3}{5}c^2d^3x^5(a+b\arcsin(cx))+\frac{3}{7}c^4d^3x^7(a+b\arcsin(cx)) \\
&\quad -\frac{1}{9}c^6d^3x^9(a+b\arcsin(cx))-(bc)\int\frac{d^3x^3(105-189c^2x^2+135c^4x^4-35c^6x^6)}{315\sqrt{1-c^2x^2}}\,dx \\
&= \frac{1}{3}d^3x^3(a+b\arcsin(cx))-\frac{3}{5}c^2d^3x^5(a+b\arcsin(cx))+\frac{3}{7}c^4d^3x^7(a+b\arcsin(cx)) \\
&\quad -\frac{1}{9}c^6d^3x^9(a+b\arcsin(cx))-\frac{1}{315}(bcd^3)\int\frac{x^3(105-189c^2x^2+135c^4x^4-35c^6x^6)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{1}{3}d^3x^3(a+b\arcsin(cx))-\frac{3}{5}c^2d^3x^5(a+b\arcsin(cx)) \\
&\quad +\frac{3}{7}c^4d^3x^7(a+b\arcsin(cx))-\frac{1}{9}c^6d^3x^9(a+b\arcsin(cx)) \\
&\quad -\frac{1}{630}(bcd^3)\,\text{Subst}\left(\int\frac{x(105-189c^2x+135c^4x^2-35c^6x^3)}{\sqrt{1-c^2x}}\,dx,x,x^2\right) \\
&= \frac{1}{3}d^3x^3(a+b\arcsin(cx))-\frac{3}{5}c^2d^3x^5(a+b\arcsin(cx))+\frac{3}{7}c^4d^3x^7(a+b\arcsin(cx)) \\
&\quad -\frac{1}{9}c^6d^3x^9(a+b\arcsin(cx))-\frac{1}{630}(bcd^3)\,\text{Subst}\left(\int\left(\frac{16}{c^2\sqrt{1-c^2x}}+\frac{8\sqrt{1-c^2x}}{c^2}\right.\right. \\
&\quad \left.\left.+\frac{6(1-c^2x)^{3/2}}{c^2}+\frac{5(1-c^2x)^{5/2}}{c^2}-\frac{35(1-c^2x)^{7/2}}{c^2}\right)dx,x,x^2\right) \\
&= \frac{16bd^3\sqrt{1-c^2x^2}}{315c^3}+\frac{8bd^3(1-c^2x^2)^{3/2}}{945c^3}+\frac{2bd^3(1-c^2x^2)^{5/2}}{525c^3} \\
&\quad +\frac{bd^3(1-c^2x^2)^{7/2}}{441c^3}-\frac{bd^3(1-c^2x^2)^{9/2}}{81c^3} \\
&\quad +\frac{1}{3}d^3x^3(a+b\arcsin(cx))-\frac{3}{5}c^2d^3x^5(a+b\arcsin(cx))+\frac{3}{7}c^4d^3x^7(a+b\arcsin(cx))-\frac{1}{9}c^6d^3x^9(a+b\,\text{ar}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.65

$$\int x^2 (d - c^2 dx^2)^3 (a + b \arcsin(cx)) \, dx$$
$$= \frac{d^3 \left(-315ac^3x^3(-105 + 189c^2x^2 - 135c^4x^4 + 35c^6x^6) + b\sqrt{1 - c^2x^2}(5258 + 2629c^2x^2 - 6297c^4x^4 + 4675c^6x\right.}{99225c^3}$$

[In] Integrate[x^2*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]

[Out] (d^3*(-315*a*c^3*x^3*(-105 + 189*c^2*x^2 - 135*c^4*x^4 + 35*c^6*x^6) + b*Sq
rt[1 - c^2*x^2]*(5258 + 2629*c^2*x^2 - 6297*c^4*x^4 + 4675*c^6*x^6 - 1225*c
^8*x^8) - 315*b*c^3*x^3*(-105 + 189*c^2*x^2 - 135*c^4*x^4 + 35*c^6*x^6)*Arc
Sin[c*x]))/(99225*c^3)

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 190, normalized size of antiderivative = 0.92

method	result
parts	$-d^3a\left(\frac{1}{9}c^6x^9 - \frac{3}{7}c^4x^7 + \frac{3}{5}c^2x^5 - \frac{1}{3}x^3\right) - \frac{d^3b\left(\frac{\arcsin(cx)c^9x^9}{9} - \frac{3\arcsin(cx)c^7x^7}{7} + \frac{3\arcsin(cx)c^5x^5}{5} - \frac{c^3x^3\arcsin(\right.}{}$
derivativedivides	$\frac{-d^3a\left(\frac{1}{9}c^9x^9 - \frac{3}{7}c^7x^7 + \frac{3}{5}c^5x^5 - \frac{1}{3}c^3x^3\right) - d^3b\left(\frac{\arcsin(cx)c^9x^9}{9} - \frac{3\arcsin(cx)c^7x^7}{7} + \frac{3\arcsin(cx)c^5x^5}{5} - \frac{c^3x^3\arcsin(cx)}{3} + \frac{c^8x^8\sqrt{-c}}{81}\right.}{c^3}$
default	$\frac{-d^3a\left(\frac{1}{9}c^9x^9 - \frac{3}{7}c^7x^7 + \frac{3}{5}c^5x^5 - \frac{1}{3}c^3x^3\right) - d^3b\left(\frac{\arcsin(cx)c^9x^9}{9} - \frac{3\arcsin(cx)c^7x^7}{7} + \frac{3\arcsin(cx)c^5x^5}{5} - \frac{c^3x^3\arcsin(cx)}{3} + \frac{c^8x^8\sqrt{-c}}{81}\right.}{c^3}$

[In] int(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] -d^3*a*(1/9*c^6*x^9-3/7*c^4*x^7+3/5*c^2*x^5-1/3*x^3)-d^3*b/c^3*(1/9*arcsin(
c*x)*c^9*x^9-3/7*arcsin(c*x)*c^7*x^7+3/5*arcsin(c*x)*c^5*x^5-1/3*c^3*x^3*ar
csin(c*x)+1/81*c^8*x^8*(-c^2*x^2+1)^(1/2)-187/3969*c^6*x^6*(-c^2*x^2+1)^(1/
2)+2099/33075*c^4*x^4*(-c^2*x^2+1)^(1/2)-2629/99225*c^2*x^2*(-c^2*x^2+1)^(1
/2)-5258/99225*(-c^2*x^2+1)^(1/2))

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 177, normalized size of antiderivative = 0.86

$$\int x^2 \left(d-c^2 d x^2\right)^3 (a+b \arcsin(cx))\, dx =$$
$$-\frac{11025\, ac^9 d^3 x^9 - 42525\, ac^7 d^3 x^7 + 59535\, ac^5 d^3 x^5 - 33075\, ac^3 d^3 x^3 + 315\, (35\, bc^9 d^3 x^9 - 135\, bc^7 d^3 x^7 + 18}{}$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/99225*(11025*a*c^9*d^3*x^9 - 42525*a*c^7*d^3*x^7 + 59535*a*c^5*d^3*x^5 -
 33075*a*c^3*d^3*x^3 + 315*(35*b*c^9*d^3*x^9 - 135*b*c^7*d^3*x^7 + 189*b*c^
5*d^3*x^5 - 105*b*c^3*d^3*x^3)*arcsin(c*x) + (1225*b*c^8*d^3*x^8 - 4675*b*c
^6*d^3*x^6 + 6297*b*c^4*d^3*x^4 - 2629*b*c^2*d^3*x^2 - 5258*b*d^3)*sqrt(-c^
2*x^2 + 1))/c^3
```

Sympy [A] (verification not implemented)

Time = 1.12 (sec) , antiderivative size = 265, normalized size of antiderivative = 1.28

$$\int x^2 \left(d-c^2 d x^2\right)^3 (a+b \arcsin(cx))\, dx$$
$$= \begin{cases} -\frac{ac^6d^3x^9}{9} + \frac{3ac^4d^3x^7}{7} - \frac{3ac^2d^3x^5}{5} + \frac{ad^3x^3}{3} - \frac{bc^6d^3x^9 \operatorname{asin}(cx)}{9} - \frac{bc^5d^3x^8\sqrt{-c^2x^2+1}}{81} + \frac{3bc^4d^3x^7 \operatorname{asin}(cx)}{7} + \frac{187bc^3d^3x^6\sqrt{-c^2x}}{3969} \\ \frac{ad^3x^3}{3} \end{cases}$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**9/9 + 3*a*c**4*d**3*x**7/7 - 3*a*c**2*d**3*x**5/
5 + a*d**3*x**3/3 - b*c**6*d**3*x**9*asin(c*x)/9 - b*c**5*d**3*x**8*sqrt(-c
**2*x**2 + 1)/81 + 3*b*c**4*d**3*x**7*asin(c*x)/7 + 187*b*c**3*d**3*x**6*sq
rt(-c**2*x**2 + 1)/3969 - 3*b*c**2*d**3*x**5*asin(c*x)/5 - 2099*b*c*d**3*x*
*4*sqrt(-c**2*x**2 + 1)/33075 + b*d**3*x**3*asin(c*x)/3 + 2629*b*d**3*x**2*
sqrt(-c**2*x**2 + 1)/(99225*c) + 5258*b*d**3*sqrt(-c**2*x**2 + 1)/(99225*c*
*3), Ne(c, 0)), (a*d**3*x**3/3, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 398 vs. 2(179) = 358.

Time = 0.28 (sec) , antiderivative size = 398, normalized size of antiderivative = 1.92

$$\int x^2 \left(d - c^2 d x^2\right)^3 (a + b \arcsin(cx))\, dx = -\frac{1}{9} a c^6 d^3 x^9 + \frac{3}{7} a c^4 d^3 x^7$$

$$-\frac{1}{2835} \left(315\, x^9 \arcsin(cx) + \left(\frac{35 \sqrt{-c^2x^2 + 1} x^8}{c^2} + \frac{40 \sqrt{-c^2x^2 + 1} x^6}{c^4} + \frac{48 \sqrt{-c^2x^2 + 1} x^4}{c^6} + \frac{64 \sqrt{-c^2x^2 +}}{c^8}\right.\right.$$

$$-\frac{3}{5} a c^2 d^3 x^5$$

$$+\frac{3}{245} \left(35\, x^7 \arcsin(cx) + \left(\frac{5 \sqrt{-c^2x^2 + 1} x^6}{c^2} + \frac{6 \sqrt{-c^2x^2 + 1} x^4}{c^4} + \frac{8 \sqrt{-c^2x^2 + 1} x^2}{c^6} + \frac{16 \sqrt{-c^2x^2 + 1}}{c^8}\right) c\right.$$

$$-\frac{1}{25} \left(15\, x^5 \arcsin(cx) + \left(\frac{3 \sqrt{-c^2x^2 + 1} x^4}{c^2} + \frac{4 \sqrt{-c^2x^2 + 1} x^2}{c^4} + \frac{8 \sqrt{-c^2x^2 + 1}}{c^6}\right) c\right) b c^2 d^3$$

$$+\frac{1}{3} a d^3 x^3 + \frac{1}{9} \left(3\, x^3 \arcsin(cx) + c \left(\frac{\sqrt{-c^2x^2 + 1} x^2}{c^2} + \frac{2 \sqrt{-c^2x^2 + 1}}{c^4}\right)\right) b d^3$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/9*a*c^6*d^3*x^9 + 3/7*a*c^4*d^3*x^7 - 1/2835*(315*x^9*arcsin(c*x) + (35*
sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x
^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^
10)*c)*b*c^6*d^3 - 3/5*a*c^2*d^3*x^5 + 3/245*(35*x^7*arcsin(c*x) + (5*sqrt(
-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)
*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^4*d^3 - 1/25*(15*x^5*arcsin(c*
x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(
-c^2*x^2 + 1)/c^6)*c)*b*c^2*d^3 + 1/3*a*d^3*x^3 + 1/9*(3*x^3*arcsin(c*x) +
c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^3
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 296, normalized size of antiderivative = 1.43

$$\int x^2 (d-c^2dx^2)^3 (a+b\arcsin(cx))\,dx = -\frac{1}{9}\,ac^6d^3x^9 + \frac{3}{7}\,ac^4d^3x^7 - \frac{3}{5}\,ac^2d^3x^5 - \frac{(c^2x^2-1)^4bd^3x\arcsin(cx)}{9\,c^2} + \frac{1}{3}\,ad^3x^3 - \frac{(c^2x^2-1)^3bd^3x\arcsin(cx)}{63\,c^2} + \frac{2\,(c^2x^2-1)^2bd^3x\arcsin(cx)}{105\,c^2} - \frac{(c^2x^2-1)^4\sqrt{-c^2x^2+1}bd^3}{81\,c^3} - \frac{8\,(c^2x^2-1)bd^3x\arcsin(cx)}{315\,c^2} - \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}bd^3}{441\,c^3} + \frac{16\,bd^3x\arcsin(cx)}{315\,c^2} + \frac{2\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}bd^3}{525\,c^3} + \frac{8\,(-c^2x^2+1)^{\frac{3}{2}}bd^3}{945\,c^3} + \frac{16\,\sqrt{-c^2x^2+1}bd^3}{315\,c^3}$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/9*a*c^6*d^3*x^9 + 3/7*a*c^4*d^3*x^7 - 3/5*a*c^2*d^3*x^5 - 1/9*(c^2*x^2 -
 1)^4*b*d^3*x*arcsin(c*x)/c^2 + 1/3*a*d^3*x^3 - 1/63*(c^2*x^2 - 1)^3*b*d^3*
x*arcsin(c*x)/c^2 + 2/105*(c^2*x^2 - 1)^2*b*d^3*x*arcsin(c*x)/c^2 - 1/81*(c
^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*d^3/c^3 - 8/315*(c^2*x^2 - 1)*b*d^3*x*ar
csin(c*x)/c^2 - 1/441*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d^3/c^3 + 16/315
*b*d^3*x*arcsin(c*x)/c^2 + 2/525*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^3/c
^3 + 8/945*(-c^2*x^2 + 1)^(3/2)*b*d^3/c^3 + 16/315*sqrt(-c^2*x^2 + 1)*b*d^3
/c^3
```

Mupad [F(-1)]

Timed out.

$$\int x^2\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))\,dx=\int x^2\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^3\,dx$$

```
[In] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^3,x)
[Out] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^3, x)
```

3.22 $\int x(d-c^2dx^2)^3 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 150

$$\int x\left(d-c^2dx^2\right)^3 (a+b\arcsin(cx))\,dx=\frac{35bd^3x\sqrt{1-c^2x^2}}{1024c}+\frac{35bd^3x(1-c^2x^2)^{3/2}}{1536c}+\frac{7bd^3x(1-c^2x^2)^{5/2}}{384c}+\frac{bd^3x(1-c^2x^2)^{7/2}}{64c}+\frac{35bd^3\arcsin(cx)}{1024c^2}-\frac{d^3(1-c^2x^2)^4(a+b\arcsin(cx))}{8c^2}$$

```
[Out] 35/1536*b*d^3*x*(-c^2*x^2+1)^(3/2)/c+7/384*b*d^3*x*(-c^2*x^2+1)^(5/2)/c+1/6
4*b*d^3*x*(-c^2*x^2+1)^(7/2)/c+35/1024*b*d^3*arcsin(c*x)/c^2-1/8*d^3*(-c^2*
x^2+1)^4*(a+b*arcsin(c*x))/c^2+35/1024*b*d^3*x*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {4767, 201, 222}

$$\int x\left(d-c^2dx^2\right)^3 (a+b\arcsin(cx))\,dx=-\frac{d^3(1-c^2x^2)^4(a+b\arcsin(cx))}{8c^2}+\frac{35bd^3\arcsin(cx)}{1024c^2}+\frac{bd^3x(1-c^2x^2)^{7/2}}{64c}+\frac{7bd^3x(1-c^2x^2)^{5/2}}{384c}+\frac{35bd^3x(1-c^2x^2)^{3/2}}{1536c}+\frac{35bd^3x\sqrt{1-c^2x^2}}{1024c}$$

```
[In] Int[x*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (35*b*d^3*x*Sqrt[1 - c^2*x^2])/(1024*c) + (35*b*d^3*x*(1 - c^2*x^2)^(3/2))/
(1536*c) + (7*b*d^3*x*(1 - c^2*x^2)^(5/2))/(384*c) + (b*d^3*x*(1 - c^2*x^2)
^(7/2))/(64*c) + (35*b*d^3*ArcSin[c*x])/(1024*c^2) - (d^3*(1 - c^2*x^2)^4*(
a + b*ArcSin[c*x]))/(8*c^2)
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{d^3(1-c^2x^2)^4\,(a+b\arcsin(cx))}{8c^2}+\frac{(bd^3)\int(1-c^2x^2)^{7/2}\,dx}{8c}\\
&= \frac{bd^3x(1-c^2x^2)^{7/2}}{64c}-\frac{d^3(1-c^2x^2)^4\,(a+b\arcsin(cx))}{8c^2}+\frac{(7bd^3)\int(1-c^2x^2)^{5/2}\,dx}{64c}\\
&= \frac{7bd^3x(1-c^2x^2)^{5/2}}{384c}+\frac{bd^3x(1-c^2x^2)^{7/2}}{64c}\\
&\quad -\frac{d^3(1-c^2x^2)^4\,(a+b\arcsin(cx))}{8c^2}+\frac{(35bd^3)\int(1-c^2x^2)^{3/2}\,dx}{384c}\\
&= \frac{35bd^3x(1-c^2x^2)^{3/2}}{1536c}+\frac{7bd^3x(1-c^2x^2)^{5/2}}{384c}+\frac{bd^3x(1-c^2x^2)^{7/2}}{64c}\\
&\quad -\frac{d^3(1-c^2x^2)^4\,(a+b\arcsin(cx))}{8c^2}+\frac{(35bd^3)\int\sqrt{1-c^2x^2}\,dx}{512c}
\end{aligned}
$$

$$= \frac{35bd^3x\sqrt{1-c^2x^2}}{1024c} + \frac{35bd^3x(1-c^2x^2)^{3/2}}{1536c} + \frac{7bd^3x(1-c^2x^2)^{5/2}}{384c} + \frac{bd^3x(1-c^2x^2)^{7/2}}{64c} - \frac{d^3(1-c^2x^2)^4(a+b\arcsin(cx))}{8c^2} + \frac{(35bd^3)\int \frac{1}{\sqrt{1-c^2x^2}}dx}{1024c}$$

$$= \frac{35bd^3x\sqrt{1-c^2x^2}}{1024c} + \frac{35bd^3x(1-c^2x^2)^{3/2}}{1536c} + \frac{7bd^3x(1-c^2x^2)^{5/2}}{384c} + \frac{bd^3x(1-c^2x^2)^{7/2}}{64c} + \frac{35bd^3\arcsin(cx)}{1024c^2} - \frac{d^3(1-c^2x^2)^4(a+b\arcsin(cx))}{8c^2}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 110, normalized size of antiderivative = 0.73

$$\int x(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx = -\frac{d^3\left(384a(-1+c^2x^2)^4 + bcx\sqrt{1-c^2x^2}(-279+326c^2x^2-200c^4x^4+48c^6x^6) + 3b(93-512c^2x^2+768c\right.}{3072c^2}$$

```
[In] Integrate[x*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
[Out] -1/3072*(d^3*(384*a*(-1 + c^2*x^2)^4 + b*c*x*Sqrt[1 - c^2*x^2]*(-279 + 326*
c^2*x^2 - 200*c^4*x^4 + 48*c^6*x^6) + 3*b*(93 - 512*c^2*x^2 + 768*c^4*x^4 -
 512*c^6*x^6 + 128*c^8*x^8)*ArcSin[c*x]))/c^2
```

Maple [A] (verified)

Time = 0.07 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.07

method	result
derivativedivides	$\frac{-\frac{d^3a(c^2x^2-1)^4}{8} - d^3b\left(\frac{\arcsin(cx)c^8x^8}{8} - \frac{\arcsin(cx)c^6x^6}{2} + \frac{3c^4x^4\arcsin(cx)}{4} - \frac{c^2x^2\arcsin(cx)}{2} + \frac{93\arcsin(cx)}{1024} + \frac{c^7x^7\sqrt{-c^2x^2+1}}{64} -\right.}{c^2}$
default	$\frac{-\frac{d^3a(c^2x^2-1)^4}{8} - d^3b\left(\frac{\arcsin(cx)c^8x^8}{8} - \frac{\arcsin(cx)c^6x^6}{2} + \frac{3c^4x^4\arcsin(cx)}{4} - \frac{c^2x^2\arcsin(cx)}{2} + \frac{93\arcsin(cx)}{1024} + \frac{c^7x^7\sqrt{-c^2x^2+1}}{64} -\right.}{c^2}$
parts	$-\frac{d^3a(c^2x^2-1)^4}{8c^2} - \frac{d^3b\left(\frac{\arcsin(cx)c^8x^8}{8} - \frac{\arcsin(cx)c^6x^6}{2} + \frac{3c^4x^4\arcsin(cx)}{4} - \frac{c^2x^2\arcsin(cx)}{2} + \frac{93\arcsin(cx)}{1024} + \frac{c^7x^7\sqrt{-c^2x^2}}{64}\right.}{c^2}$

```
[In] int(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] 1/c^2*(-1/8*d^3*a*(c^2*x^2-1)^4-d^3*b*(1/8*arcsin(c*x)*c^8*x^8-1/2*arcsin(c
*x)*c^6*x^6+3/4*c^4*x^4*arcsin(c*x)-1/2*c^2*x^2*arcsin(c*x)+93/1024*arcsin(
c*x)+1/64*c^7*x^7*(-c^2*x^2+1)^(1/2)-25/384*c^5*x^5*(-c^2*x^2+1)^(1/2)+163/
1536*c^3*x^3*(-c^2*x^2+1)^(1/2)-93/1024*c*x*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.15

$$\int x\left(d-c^2dx^2\right)^3\left(a+b\arcsin(cx)\right)dx = -\frac{384\,ac^8d^3x^8-1536\,ac^6d^3x^6+2304\,ac^4d^3x^4-1536\,ac^2d^3x^2+3\,(128\,bc^8d^3x^8-512\,bc^6d^3x^6+768\,bc^4d^3x^4}{307}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/3072*(384*a*c^8*d^3*x^8 - 1536*a*c^6*d^3*x^6 + 2304*a*c^4*d^3*x^4 - 1536
*a*c^2*d^3*x^2 + 3*(128*b*c^8*d^3*x^8 - 512*b*c^6*d^3*x^6 + 768*b*c^4*d^3*x
^4 - 512*b*c^2*d^3*x^2 + 93*b*d^3)*arcsin(c*x) + (48*b*c^7*d^3*x^7 - 200*b*
c^5*d^3*x^5 + 326*b*c^3*d^3*x^3 - 279*b*c*d^3*x)*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [A] (verification not implemented)

Time = 0.86 (sec) , antiderivative size = 253, normalized size of antiderivative = 1.69

$$\int x\left(d-c^2dx^2\right)^3\left(a+b\arcsin(cx)\right)dx = \begin{cases} -\frac{ac^6d^3x^8}{8}+\frac{ac^4d^3x^6}{2}-\frac{3ac^2d^3x^4}{4}+\frac{ad^3x^2}{2}-\frac{bc^6d^3x^8\operatorname{asin}(cx)}{8}-\frac{bc^5d^3x^7\sqrt{-c^2x^2+1}}{64}+\frac{bc^4d^3x^6\operatorname{asin}(cx)}{2}+\frac{25bc^3d^3x^5\sqrt{-c^2x^2+1}}{384} \\ \frac{ad^3x^2}{2} \end{cases}$$

```
[In] integrate(x*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**8/8 + a*c**4*d**3*x**6/2 - 3*a*c**2*d**3*x**4/4
+ a*d**3*x**2/2 - b*c**6*d**3*x**8*asin(c*x)/8 - b*c**5*d**3*x**7*sqrt(-c**
2*x**2 + 1)/64 + b*c**4*d**3*x**6*asin(c*x)/2 + 25*b*c**3*d**3*x**5*sqrt(-c
**2*x**2 + 1)/384 - 3*b*c**2*d**3*x**4*asin(c*x)/4 - 163*b*c*d**3*x**3*sqrt
(-c**2*x**2 + 1)/1536 + b*d**3*x**2*asin(c*x)/2 + 93*b*d**3*x*sqrt(-c**2*x*
*2 + 1)/(1024*c) - 93*b*d**3*asin(c*x)/(1024*c**2), Ne(c, 0)), (a*d**3*x**2
/2, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 358 vs. $2(129) = 258$.

Time = 0.29 (sec) , antiderivative size = 358, normalized size of antiderivative = 2.39

$$\int x\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))\,dx = -\frac{1}{8}\,ac^6d^3x^8+\frac{1}{2}\,ac^4d^3x^6$$
$$-\frac{1}{3072}\left(384\,x^8\arcsin\left(cx\right)+\left(\frac{48\,\sqrt{-c^2x^2+1}x^7}{c^2}+\frac{56\,\sqrt{-c^2x^2+1}x^5}{c^4}+\frac{70\,\sqrt{-c^2x^2+1}x^3}{c^6}+\frac{105\,\sqrt{-c^2x}}{c^8}\right.\right.$$
$$-\frac{3}{4}\,ac^2d^3x^4$$
$$+\frac{1}{96}\left(48\,x^6\arcsin\left(cx\right)+\left(\frac{8\,\sqrt{-c^2x^2+1}x^5}{c^2}+\frac{10\,\sqrt{-c^2x^2+1}x^3}{c^4}+\frac{15\,\sqrt{-c^2x^2+1}x}{c^6}-\frac{15\,\arcsin\left(cx\right)}{c^7}\right)c\right.$$
$$-\frac{3}{32}\left(8\,x^4\arcsin\left(cx\right)+\left(\frac{2\,\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\,\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\,\arcsin\left(cx\right)}{c^5}\right)c\right)bc^2d^3$$
$$+\frac{1}{2}\,ad^3x^2+\frac{1}{4}\left(2\,x^2\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2}-\frac{\arcsin\left(cx\right)}{c^3}\right)\right)bd^3$$

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/8*a*c^6*d^3*x^8 + 1/2*a*c^4*d^3*x^6 - 1/3072*(384*x^8*arcsin(c*x) + (48*
sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x
^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c*x)/c^9)*c)*b*
c^6*d^3 - 3/4*a*c^2*d^3*x^4 + 1/96*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 +
 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 -
 15*arcsin(c*x)/c^7)*c)*b*c^4*d^3 - 3/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*
x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*c^2
*d^3 + 1/2*a*d^3*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2
 - arcsin(c*x)/c^3))*b*d^3
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.35

$$\int x(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx = -\frac{1}{8}ac^6d^3x^8+\frac{1}{2}ac^4d^3x^6-\frac{3}{4}ac^2d^3x^4 - \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}bd^3x}{64\,c} - \frac{(c^2x^2-1)^4bd^3\arcsin(cx)}{8\,c^2} + \frac{7\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}bd^3x}{384\,c} + \frac{35\,(-c^2x^2+1)^{\frac{3}{2}}bd^3x}{1536\,c} + \frac{35\,\sqrt{-c^2x^2+1}bd^3x}{1024\,c} + \frac{(c^2x^2-1)ad^3}{2\,c^2} + \frac{35\,bd^3\arcsin(cx)}{1024\,c^2}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/8*a*c^6*d^3*x^8 + 1/2*a*c^4*d^3*x^6 - 3/4*a*c^2*d^3*x^4 - 1/64*(c^2*x^2
- 1)^3*sqrt(-c^2*x^2 + 1)*b*d^3*x/c - 1/8*(c^2*x^2 - 1)^4*b*d^3*arcsin(c*x)
/c^2 + 7/384*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^3*x/c + 35/1536*(-c^2*x
^2 + 1)^(3/2)*b*d^3*x/c + 35/1024*sqrt(-c^2*x^2 + 1)*b*d^3*x/c + 1/2*(c^2*x
^2 - 1)*a*d^3/c^2 + 35/1024*b*d^3*arcsin(c*x)/c^2
```

Mupad [F(-1)]

Timed out.

$$\int x(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx = \int x\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^3\,dx$$

```
[In] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^3,x)
```

```
[Out] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^3, x)
```

3.23 $\int (d-c^2dx^2)^3 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 22, antiderivative size = 175

$$\int (d-c^2dx^2)^3 (a+b\arcsin(cx))\,dx = \frac{16bd^3\sqrt{1-c^2x^2}}{35c}+\frac{8bd^3(1-c^2x^2)^{3/2}}{105c}+\frac{6bd^3(1-c^2x^2)^{5/2}}{175c}+\frac{bd^3(1-c^2x^2)^{7/2}}{49c} +d^3x(a+b\arcsin(cx))-c^2d^3x^3(a+b\arcsin(cx))+\frac{3}{5}c^4d^3x^5(a+b\arcsin(cx))-\frac{1}{7}c^6d^3x^7(a+b\arcsin(cx))$$

```
[Out] 8/105*b*d^3*(-c^2*x^2+1)^(3/2)/c+6/175*b*d^3*(-c^2*x^2+1)^(5/2)/c+1/49*b*d^
3*(-c^2*x^2+1)^(7/2)/c+d^3*x*(a+b*arcsin(c*x))-c^2*d^3*x^3*(a+b*arcsin(c*x)
)+3/5*c^4*d^3*x^5*(a+b*arcsin(c*x))-1/7*c^6*d^3*x^7*(a+b*arcsin(c*x))+16/35
*b*d^3*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {200, 4739, 12, 1813, 1864}

$$\int (d-c^2dx^2)^3 (a+b\arcsin(cx))\,dx = -\frac{1}{7}c^6d^3x^7(a+b\arcsin(cx))+\frac{3}{5}c^4d^3x^5(a+b\arcsin(cx)) - c^2d^3x^3(a+b\arcsin(cx))+d^3x(a+b\arcsin(cx)) +\frac{bd^3(1-c^2x^2)^{7/2}}{49c}+\frac{6bd^3(1-c^2x^2)^{5/2}}{175c} +\frac{8bd^3(1-c^2x^2)^{3/2}}{105c}+\frac{16bd^3\sqrt{1-c^2x^2}}{35c}$$

```
[In] Int[(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (16*b*d^3*Sqrt[1 - c^2*x^2])/(35*c) + (8*b*d^3*(1 - c^2*x^2)^(3/2))/(105*c)
 + (6*b*d^3*(1 - c^2*x^2)^(5/2))/(175*c) + (b*d^3*(1 - c^2*x^2)^(7/2))/(49*
c) + d^3*x*(a + b*ArcSin[c*x]) - c^2*d^3*x^3*(a + b*ArcSin[c*x]) + (3*c^4*d
^3*x^5*(a + b*ArcSin[c*x]))/5 - (c^6*d^3*x^7*(a + b*ArcSin[c*x]))/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= d^3x(a+b\arcsin(cx)) - c^2d^3x^3(a+b\arcsin(cx)) + \frac{3}{5}c^4d^3x^5(a+b\arcsin(cx)) \\
&\quad - \frac{1}{7}c^6d^3x^7(a+b\arcsin(cx)) - (bc)\int \frac{d^3x(35-35c^2x^2+21c^4x^4-5c^6x^6)}{35\sqrt{1-c^2x^2}}\,dx \\
&= d^3x(a+b\arcsin(cx)) - c^2d^3x^3(a+b\arcsin(cx)) + \frac{3}{5}c^4d^3x^5(a+b\arcsin(cx)) \\
&\quad - \frac{1}{7}c^6d^3x^7(a+b\arcsin(cx)) - \frac{1}{35}\left(bcd^3\right)\int \frac{x(35-35c^2x^2+21c^4x^4-5c^6x^6)}{\sqrt{1-c^2x^2}}\,dx
\end{aligned}$$

$$= d^3x(a + b\arcsin(cx)) - c^2d^3x^3(a + b\arcsin(cx)) + \frac{3}{5}c^4d^3x^5(a + b\arcsin(cx)) - \frac{1}{7}c^6d^3x^7(a + b\arcsin(cx)) - \frac{1}{70}(bcd^3)\,\text{Subst}\left(\int \frac{35 - 35c^2x + 21c^4x^2 - 5c^6x^3}{\sqrt{1 - c^2x}}\,dx, x, x^2\right)$$

$$= d^3x(a + b\arcsin(cx)) - c^2d^3x^3(a + b\arcsin(cx)) + \frac{3}{5}c^4d^3x^5(a + b\arcsin(cx)) - \frac{1}{7}c^6d^3x^7(a + b\arcsin(cx)) - \frac{1}{70}(bcd^3)\,\text{Subst}\left(\int \left(\frac{16}{\sqrt{1 - c^2x}} + 8\sqrt{1 - c^2x} + 6(1 - c^2x)^{3/2} + 5(1 - c^2x)^{5/2}\right) dx, x, x^2\right)$$

$$= \frac{16bd^3\sqrt{1 - c^2x^2}}{35c} + \frac{8bd^3(1 - c^2x^2)^{3/2}}{105c} + \frac{6bd^3(1 - c^2x^2)^{5/2}}{175c} + \frac{bd^3(1 - c^2x^2)^{7/2}}{49c} + d^3x(a+b\arcsin(cx)) - c^2d^3x^3(a+b\arcsin(cx)) + \frac{3}{5}c^4d^3x^5(a+b\arcsin(cx)) - \frac{1}{7}c^6d^3x^7(a+b\arcsin($$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 119, normalized size of antiderivative = 0.68

$$\int (d - c^2dx^2)^3 (a + b\arcsin(cx))\,dx = -\frac{d^3\left(105acx(-35 + 35c^2x^2 - 21c^4x^4 + 5c^6x^6) + b\sqrt{1 - c^2x^2}(-2161 + 757c^2x^2 - 351c^4x^4 + 75c^6x^6) + 10\right.}{3675c}$$

```
[In] Integrate[(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
[Out] -1/3675*(d^3*(105*a*c*x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) + b*Sqr
t[1 - c^2*x^2]*(-2161 + 757*c^2*x^2 - 351*c^4*x^4 + 75*c^6*x^6) + 105*b*c*x
*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6)*ArcSin[c*x]))/c
```

Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 162, normalized size of antiderivative = 0.93

method	result
parts	$-d^3a\left(\frac{1}{7}c^6x^7 - \frac{3}{5}c^4x^5 + c^2x^3 - x\right) - \frac{d^3b\left(\frac{\arcsin(cx)c^7x^7}{7} - \frac{3\arcsin(cx)c^5x^5}{5} + c^3x^3\arcsin(cx) - cx\arcsin(cx) - \right.}{}$
derivativedivides	$\frac{-d^3a\left(\frac{1}{7}c^7x^7 - \frac{3}{5}c^5x^5 + c^3x^3 - cx\right) - d^3b\left(\frac{\arcsin(cx)c^7x^7}{7} - \frac{3\arcsin(cx)c^5x^5}{5} + c^3x^3\arcsin(cx) - cx\arcsin(cx) - \frac{2161\sqrt{-c^2x^2+1}}{3675}\right.}{c}$
default	$\frac{-d^3a\left(\frac{1}{7}c^7x^7 - \frac{3}{5}c^5x^5 + c^3x^3 - cx\right) - d^3b\left(\frac{\arcsin(cx)c^7x^7}{7} - \frac{3\arcsin(cx)c^5x^5}{5} + c^3x^3\arcsin(cx) - cx\arcsin(cx) - \frac{2161\sqrt{-c^2x^2+1}}{3675}\right.}{c}$

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -d^3*a*(1/7*c^6*x^7-3/5*c^4*x^5+c^2*x^3-x)-d^3*b/c*(1/7*arcsin(c*x)*c^7*x^7
-3/5*arcsin(c*x)*c^5*x^5+c^3*x^3*arcsin(c*x)-c*x*arcsin(c*x)-2161/3675*(-c^
2*x^2+1)^(1/2)+1/49*c^6*x^6*(-c^2*x^2+1)^(1/2)-117/1225*c^4*x^4*(-c^2*x^2+1
)^(1/2)+757/3675*c^2*x^2*(-c^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 157, normalized size of antiderivative = 0.90

$$\int \left(d-c^2dx^2\right)^3 (a+b\arcsin(cx))\,dx = -\frac{525\,ac^7d^3x^7-2205\,ac^5d^3x^5+3675\,ac^3d^3x^3-3675\,acd^3x+105\,(5\,bc^7d^3x^7-21\,bc^5d^3x^5+35\,bc^3d^3x^3-3}{3675\,c}$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/3675*(525*a*c^7*d^3*x^7 - 2205*a*c^5*d^3*x^5 + 3675*a*c^3*d^3*x^3 - 3675
*a*c*d^3*x + 105*(5*b*c^7*d^3*x^7 - 21*b*c^5*d^3*x^5 + 35*b*c^3*d^3*x^3 - 3
5*b*c*d^3*x)*arcsin(c*x) + (75*b*c^6*d^3*x^6 - 351*b*c^4*d^3*x^4 + 757*b*c^
2*d^3*x^2 - 2161*b*d^3)*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A] (verification not implemented)

Time = 0.56 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.26

$$\int \left(d-c^2dx^2\right)^3 (a+b\arcsin(cx))\,dx = \begin{cases} -\frac{ac^6d^3x^7}{7}+\frac{3ac^4d^3x^5}{5}-ac^2d^3x^3+ad^3x-\frac{bc^6d^3x^7\operatorname{asin}{(cx)}}{7}-\frac{bc^5d^3x^6\sqrt{-c^2x^2+1}}{49}+\frac{3bc^4d^3x^5\operatorname{asin}{(cx)}}{5}+\frac{117bc^3d^3x^4\sqrt{-c^2x^2}}{1225} \\ ad^3x \end{cases}$$

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((-a*c**6*d**3*x**7/7 + 3*a*c**4*d**3*x**5/5 - a*c**2*d**3*x**3 +
a*d**3*x - b*c**6*d**3*x**7*asin(c*x)/7 - b*c**5*d**3*x**6*sqrt(-c**2*x**2
+ 1)/49 + 3*b*c**4*d**3*x**5*asin(c*x)/5 + 117*b*c**3*d**3*x**4*sqrt(-c**2*
x**2 + 1)/1225 - b*c**2*d**3*x**3*asin(c*x) - 757*b*c*d**3*x**2*sqrt(-c**2*
x**2 + 1)/3675 + b*d**3*x*asin(c*x) + 2161*b*d**3*sqrt(-c**2*x**2 + 1)/(367
5*c), Ne(c, 0)), (a*d**3*x, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 307, normalized size of antiderivative = 1.75

$$\int \left(d-c^2dx^2\right)^3(a+b\arcsin(cx))\,dx=-\frac{1}{7}\,ac^6d^3x^7+\frac{3}{5}\,ac^4d^3x^5$$
$$-\frac{1}{245}\left(35\,x^7\arcsin\left(cx\right)+\left(\frac{5\,\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\,\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\,\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\,\sqrt{-c^2x^2+1}}{c^8}\right)\right.$$
$$\left.+\frac{1}{25}\left(15\,x^5\arcsin\left(cx\right)+\left(\frac{3\,\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\,\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\,\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bc^4d^3\right.$$
$$-ac^2d^3x^3-\frac{1}{3}\left(3\,x^3\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)bc^2d^3$$
$$+ad^3x+\frac{\left(cx\arcsin\left(cx\right)+\sqrt{-c^2x^2+1}\right)bd^3}{c}$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/7*a*c^6*d^3*x^7 + 3/5*a*c^4*d^3*x^5 - 1/245*(35*x^7*arcsin(c*x) + (5*sqr
t(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 +
1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*c^6*d^3 + 1/25*(15*x^5*arcsin(
c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqr
t(-c^2*x^2 + 1)/c^6)*c)*b*c^4*d^3 - a*c^2*d^3*x^3 - 1/3*(3*x^3*arcsin(c*x)
+ c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^2*d^3 + a*
d^3*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d^3/c
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 224, normalized size of antiderivative = 1.28

$$\int (d-c^2dx^2)^3 (a+b\arcsin(cx))\,dx = -\frac{1}{7}ac^6d^3x^7 + \frac{3}{5}ac^4d^3x^5 - ac^2d^3x^3 - \frac{1}{7}(c^2x^2-1)^3bd^3x\arcsin(cx) + \frac{6}{35}(c^2x^2-1)^2bd^3x\arcsin(cx) - \frac{8}{35}(c^2x^2-1)bd^3x\arcsin(cx) - \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}bd^3}{49\,c} + \frac{16}{35}bd^3x\arcsin(cx) + \frac{6(c^2x^2-1)^2\sqrt{-c^2x^2+1}bd^3}{175\,c} + ad^3x + \frac{8(-c^2x^2+1)^{\frac{3}{2}}bd^3}{105\,c} + \frac{16\sqrt{-c^2x^2+1}bd^3}{35\,c}$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -1/7*a*c^6*d^3*x^7 + 3/5*a*c^4*d^3*x^5 - a*c^2*d^3*x^3 - 1/7*(c^2*x^2 - 1)^
3*b*d^3*x*arcsin(c*x) + 6/35*(c^2*x^2 - 1)^2*b*d^3*x*arcsin(c*x) - 8/35*(c^
2*x^2 - 1)*b*d^3*x*arcsin(c*x) - 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*
d^3/c + 16/35*b*d^3*x*arcsin(c*x) + 6/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1
)*b*d^3/c + a*d^3*x + 8/105*(-c^2*x^2 + 1)^(3/2)*b*d^3/c + 16/35*sqrt(-c^2*
x^2 + 1)*b*d^3/c
```

Mupad [F(-1)]

Timed out.

$$\int (d-c^2dx^2)^3 (a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^3\,dx$$

```
[In] int((a + b*asin(c*x))*(d - c^2*d*x^2)^3,x)
```

```
[Out] int((a + b*asin(c*x))*(d - c^2*d*x^2)^3, x)
```

3.24 $\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))}{x}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 235

$$\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))}{x}\,dx = -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2}-\frac{7}{72}bcd^3x(1-c^2x^2)^{3/2} - \frac{1}{36}bcd^3x(1-c^2x^2)^{5/2} - \frac{19}{48}bd^3\arcsin(cx)+\frac{1}{2}d^3(1-c^2x^2)(a+b\arcsin(cx)) + \frac{1}{4}d^3(1-c^2x^2)^2(a+b\arcsin(cx)) + \frac{1}{6}d^3(1-c^2x^2)^3(a+b\arcsin(cx)) - \frac{id^3(a+b\arcsin(cx))^2}{2b} + d^3(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) - \frac{1}{2}ibd^3\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)$$

```
[Out] -7/72*b*c*d^3*x*(-c^2*x^2+1)^(3/2)-1/36*b*c*d^3*x*(-c^2*x^2+1)^(5/2)-19/48*
b*d^3*arcsin(c*x)+1/2*d^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))+1/4*d^3*(-c^2*x^2+
1)^2*(a+b*arcsin(c*x))+1/6*d^3*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))-1/2*I*d^3*(
a+b*arcsin(c*x))^2/b+d^3*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^
2)-1/2*I*b*d^3*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-19/48*b*c*d^3*x*(-c^
2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 235, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {4773, 4721, 3798, 2221, 2317, 2438, 201, 222}

$$\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))}{x}\,dx = \frac{1}{6}d^3(1-c^2x^2)^3(a+b\arcsin(cx)) + \frac{1}{4}d^3(1-c^2x^2)^2(a+b\arcsin(cx)) + \frac{1}{2}d^3(1-c^2x^2)(a+b\arcsin(cx)) - \frac{id^3(a+b\arcsin(cx))^2}{2b} + d^3\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx)) - \frac{1}{2}ibd^3\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) - \frac{19}{48}bd^3\arcsin(cx) - \frac{1}{36}bcd^3x(1-c^2x^2)^{5/2} - \frac{7}{72}bcd^3x(1-c^2x^2)^{3/2} - \frac{19}{48}bcd^3x\sqrt{1-c^2x^2}$$

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (-19*b*c*d^3*x*Sqrt[1 - c^2*x^2])/48 - (7*b*c*d^3*x*(1 - c^2*x^2)^(3/2))/72
 - (b*c*d^3*x*(1 - c^2*x^2)^(5/2))/36 - (19*b*d^3*ArcSin[c*x])/48 + (d^3*(1
 - c^2*x^2)*(a + b*ArcSin[c*x]))/2 + (d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x
]))/4 + (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/6 - ((I/2)*d^3*(a + b*Arc
Sin[c*x])^2)/b + d^3*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])] - (
I/2)*b*d^3*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx)) \\
&\quad + d\int\frac{\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))}{x}\,dx - \frac{1}{6}\left(bcd^3\right)\int\left(1-c^2x^2\right)^{5/2}\,dx \\
&= -\frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2} + \frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) \\
&\quad + \frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx)) + d^2\int\frac{\left(d-c^2dx^2\right)(a+b\arcsin(cx))}{x}\,dx \\
&\quad - \frac{1}{36}\left(5bcd^3\right)\int\left(1-c^2x^2\right)^{3/2}\,dx - \frac{1}{4}\left(bcd^3\right)\int\left(1-c^2x^2\right)^{3/2}\,dx
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{7}{72}bcd^3x\left(1-c^2x^2\right)^{3/2} - \frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2} + \frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\arcsin(cx)) \\
&\quad + \frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) + \frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx)) \\
&\quad + d^3\int\frac{a+b\arcsin(cx)}{x}\,dx - \frac{1}{48}\left(5bcd^3\right)\int\sqrt{1-c^2x^2}\,dx \\
&\quad - \frac{1}{16}\left(3bcd^3\right)\int\sqrt{1-c^2x^2}\,dx - \frac{1}{2}\left(bcd^3\right)\int\sqrt{1-c^2x^2}\,dx \\
&= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2} - \frac{7}{72}bcd^3x\left(1-c^2x^2\right)^{3/2} \\
&\quad - \frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2} + \frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\arcsin(cx)) \\
&\quad + \frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) + \frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx)) \\
&\quad + d^3\text{Subst}\left(\int(a+bx)\cot(x)\,dx, x, \arcsin(cx)\right) - \frac{1}{96}\left(5bcd^3\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx \\
&\quad - \frac{1}{32}\left(3bcd^3\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx - \frac{1}{4}\left(bcd^3\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2} - \frac{7}{72}bcd^3x\left(1-c^2x^2\right)^{3/2} \\
&\quad - \frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2} - \frac{19}{48}bd^3\arcsin(cx) + \frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\arcsin(cx)) \\
&\quad + \frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) + \frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx)) \\
&\quad - \frac{id^3(a+b\arcsin(cx))^2}{2b} - \left(2id^3\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right) \\
&= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2} - \frac{7}{72}bcd^3x\left(1-c^2x^2\right)^{3/2} \\
&\quad - \frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2} - \frac{19}{48}bd^3\arcsin(cx) + \frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\arcsin(cx)) \\
&\quad + \frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) + \frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx)) \\
&\quad - \frac{id^3(a+b\arcsin(cx))^2}{2b} + d^3(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) \\
&\quad - \left(bd^3\right)\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2} - \frac{7}{72}bcd^3x\left(1-c^2x^2\right)^{3/2} \\
&\quad - \frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2} - \frac{19}{48}bd^3\arcsin(cx) + \frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\arcsin(cx)) \\
&\quad + \frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) + \frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx)) \\
&\quad - \frac{id^3(a+b\arcsin(cx))^2}{2b} + d^3(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) \\
&\quad + \frac{1}{2}\left(ibd^3\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right) \\
&= -\frac{19}{48}bcd^3x\sqrt{1-c^2x^2} - \frac{7}{72}bcd^3x\left(1-c^2x^2\right)^{3/2} \\
&\quad - \frac{1}{36}bcd^3x\left(1-c^2x^2\right)^{5/2} - \frac{19}{48}bd^3\arcsin(cx) \\
&\quad + \frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\arcsin(cx)) + \frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) \\
&\quad + \frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx)) - \frac{id^3(a+b\arcsin(cx))^2}{2b} \\
&\quad + d^3(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) - \frac{1}{2}ibd^3\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.55 (sec) , antiderivative size = 207, normalized size of antiderivative = 0.88

$$
\begin{aligned}
\int\frac{\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))}{x}\,dx = -\frac{1}{144}d^3\Bigg(&216ac^2x^2 - 108ac^4x^4 + 24ac^6x^6 \\
&+ 75bcx\sqrt{1-c^2x^2} - 22bc^3x^3\sqrt{1-c^2x^2} \\
&+ 4bc^5x^5\sqrt{1-c^2x^2} + 72ib\arcsin(cx)^2 \\
&- 150b\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right) \\
&+ 12b\arcsin(cx)\left(18c^2x^2 - 9c^4x^4 + 2c^6x^6\right. \\
&\left.- 12\log\left(1-e^{2i\arcsin(cx)}\right)\right) - 144a\log(x) \\
&+ 72ib\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)\Bigg)
\end{aligned}
$$

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -1/144*(d^3*(216*a*c^2*x^2 - 108*a*c^4*x^4 + 24*a*c^6*x^6 + 75*b*c*x*Sqrt[1
 - c^2*x^2] - 22*b*c^3*x^3*Sqrt[1 - c^2*x^2] + 4*b*c^5*x^5*Sqrt[1 - c^2*x^2
] + (72*I)*b*ArcSin[c*x]^2 - 150*b*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])] +
 12*b*ArcSin[c*x]*(18*c^2*x^2 - 9*c^4*x^4 + 2*c^6*x^6 - 12*Log[1 - E^((2*I)
*ArcSin[c*x])]) - 144*a*Log[x] + (72*I)*b*PolyLog[2, E^((2*I)*ArcSin[c*x])]
))
```

Maple [A] (verified)

Time = 0.15 (sec) , antiderivative size = 221, normalized size of antiderivative = 0.94

method	result
parts	$-d^3a\left(\frac{c^6x^6}{6}-\frac{3c^4x^4}{4}+\frac{3c^2x^2}{2}-\ln(x)\right)-d^3b\left(\frac{i\arcsin(cx)^2}{2}-\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x\right.\right.$
derivativedivides	$-d^3a\left(\frac{c^6x^6}{6}-\frac{3c^4x^4}{4}+\frac{3c^2x^2}{2}-\ln(cx)\right)-d^3b\left(\frac{i\arcsin(cx)^2}{2}-\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2\right.\right.$
default	$-d^3a\left(\frac{c^6x^6}{6}-\frac{3c^4x^4}{4}+\frac{3c^2x^2}{2}-\ln(cx)\right)-d^3b\left(\frac{i\arcsin(cx)^2}{2}-\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2\right.\right.$

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
[Out] -d^3*a*(1/6*c^6*x^6-3/4*c^4*x^4+3/2*c^2*x^2-ln(x))-d^3*b*(1/2*I*arcsin(c*x)
^2-arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+I*polylog(2,-I*c*x-(-c^2*x^2+
1)^(1/2))-arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+I*polylog(2,I*c*x+(-c^
2*x^2+1)^(1/2))-1/192*arcsin(c*x)*cos(6*arcsin(c*x))+1/1152*sin(6*arcsin(c*
x))-1/16*arcsin(c*x)*cos(4*arcsin(c*x))+1/64*sin(4*arcsin(c*x))-29/64*arcsi
n(c*x)*cos(2*arcsin(c*x))+29/128*sin(2*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))}{x}\,dx=\int -\frac{(c^2dx^2-d)^3(b\arcsin(cx)+a)}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
[Out] integral(-(a*c^6*d^3*x^6 - 3*a*c^4*d^3*x^4 + 3*a*c^2*d^3*x^2 - a*d^3 + (b*c
^6*d^3*x^6 - 3*b*c^4*d^3*x^4 + 3*b*c^2*d^3*x^2 - b*d^3)*arcsin(c*x))/x, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))}{x}\,dx=-d^3\left(\int\left(-\frac{a}{x}\right)dx+\int 3ac^2x\,dx+\int\left(-3ac^4x^3\right)dx+\int ac^6x^5\,dx+\int\left(-\frac{b\operatorname{asin}(cx)}{x}\right)dx+\int 3bc^2x\operatorname{asin}(cx)\,dx+\int\left(-3bc^4x^3\operatorname{asin}(cx)\right)dx+\int bc^6x^5\operatorname{asin}(cx)\,dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))/x,x)
```

```
[Out] -d**3*(Integral(-a/x, x) + Integral(3*a*c**2*x, x) + Integral(-3*a*c**4*x**
3, x) + Integral(a*c**6*x**5, x) + Integral(-b*asin(c*x)/x, x) + Integral(3
*b*c**2*x*asin(c*x), x) + Integral(-3*b*c**4*x**3*asin(c*x), x) + Integral(
b*c**6*x**5*asin(c*x), x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))}{x}\,dx = \int -\frac{(c^2dx^2-d)^3(b\arcsin(cx)+a)}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] -1/6*a*c^6*d^3*x^6 + 3/4*a*c^4*d^3*x^4 - 3/2*a*c^2*d^3*x^2 + a*d^3*log(x) -
 integrate((b*c^6*d^3*x^6 - 3*b*c^4*d^3*x^4 + 3*b*c^2*d^3*x^2 - b*d^3)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Giac [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))}{x}\,dx = \int -\frac{(c^2dx^2-d)^3(b\arcsin(cx)+a)}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)^3}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x, x)
```

3.25 $\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))}{x^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 164

$$\begin{aligned}\int \frac{(d-c^2dx^2)^3\,(a+b\arcsin(cx))}{x^2}\,dx = &-\frac{11}{5}bcd^3\sqrt{1-c^2x^2}-\frac{1}{5}bcd^3\left(1-c^2x^2\right)^{3/2}\\&-\frac{1}{25}bcd^3\left(1-c^2x^2\right)^{5/2}-\frac{d^3(a+b\arcsin(cx))}{x}\\&-3c^2d^3x(a+b\arcsin(cx))+c^4d^3x^3(a+b\arcsin(cx))\\&-\frac{1}{5}c^6d^3x^5(a+b\arcsin(cx))\\&-bcd^3\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)\end{aligned}$$

```
[Out] -1/5*b*c*d^3*(-c^2*x^2+1)^(3/2)-1/25*b*c*d^3*(-c^2*x^2+1)^(5/2)-d^3*(a+b*ar
csin(c*x))/x-3*c^2*d^3*x*(a+b*arcsin(c*x))+c^4*d^3*x^3*(a+b*arcsin(c*x))-1/
5*c^6*d^3*x^5*(a+b*arcsin(c*x))-b*c*d^3*arctanh((-c^2*x^2+1)^(1/2))-11/5*b*
c*d^3*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used

= {276, 4777, 12, 1813, 1634, 65, 214}

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))}{x^2}\,dx = -\frac{1}{5}c^6d^3x^5(a+b\arcsin(cx))+c^4d^3x^3(a+b\arcsin(cx)) - 3c^2d^3x(a+b\arcsin(cx)) - \frac{d^3(a+b\arcsin(cx))}{x} - bcd^3\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right) - \frac{1}{25}bcd^3\left(1-c^2x^2\right)^{5/2} - \frac{1}{5}bcd^3\left(1-c^2x^2\right)^{3/2} - \frac{11}{5}bcd^3\sqrt{1-c^2x^2}$$

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (-11*b*c*d^3*Sqrt[1 - c^2*x^2])/5 - (b*c*d^3*(1 - c^2*x^2)^(3/2))/5 - (b*c*
d^3*(1 - c^2*x^2)^(5/2))/25 - (d^3*(a + b*ArcSin[c*x]))/x - 3*c^2*d^3*x*(a
+ b*ArcSin[c*x]) + c^4*d^3*x^3*(a + b*ArcSin[c*x]) - (c^6*d^3*x^5*(a + b*Ar
cSin[c*x]))/5 - b*c*d^3*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
```

```
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^3(a+b\arcsin(cx))}{x} - 3c^2d^3x(a+b\arcsin(cx)) + c^4d^3x^3(a+b\arcsin(cx)) \\
&\quad - \frac{1}{5}c^6d^3x^5(a+b\arcsin(cx)) - (bc)\int \frac{d^3(-5-15c^2x^2+5c^4x^4-c^6x^6)}{5x\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d^3(a+b\arcsin(cx))}{x} - 3c^2d^3x(a+b\arcsin(cx)) + c^4d^3x^3(a+b\arcsin(cx)) \\
&\quad - \frac{1}{5}c^6d^3x^5(a+b\arcsin(cx)) - \frac{1}{5}(bcd^3)\int \frac{-5-15c^2x^2+5c^4x^4-c^6x^6}{x\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d^3(a+b\arcsin(cx))}{x} - 3c^2d^3x(a+b\arcsin(cx)) + c^4d^3x^3(a \\
&\quad + b\arcsin(cx)) - \frac{1}{5}c^6d^3x^5(a+b\arcsin(cx)) \\
&\quad - \frac{1}{10}(bcd^3)\,\text{Subst}\left(\int \frac{-5-15c^2x+5c^4x^2-c^6x^3}{x\sqrt{1-c^2x}}\,dx, x, x^2\right) \\
&= -\frac{d^3(a+b\arcsin(cx))}{x} - 3c^2d^3x(a+b\arcsin(cx)) + c^4d^3x^3(a+b\arcsin(cx)) \\
&\quad - \frac{1}{5}c^6d^3x^5(a+b\arcsin(cx)) - \frac{1}{10}(bcd^3)\,\text{Subst}\left(\int \left(-\frac{11c^2}{\sqrt{1-c^2x}} - \frac{5}{x\sqrt{1-c^2x}}\right.\right. \\
&\quad \left.\left. - 3c^2\sqrt{1-c^2x} - c^2(1-c^2x)^{3/2}\right)dx, x, x^2\right) \\
&= -\frac{11}{5}bcd^3\sqrt{1-c^2x^2} - \frac{1}{5}bcd^3(1-c^2x^2)^{3/2} - \frac{1}{25}bcd^3(1-c^2x^2)^{5/2} \\
&\quad - \frac{d^3(a+b\arcsin(cx))}{x} - 3c^2d^3x(a+b\arcsin(cx)) + c^4d^3x^3(a+b\arcsin(cx)) \\
&\quad - \frac{1}{5}c^6d^3x^5(a+b\arcsin(cx)) + \frac{1}{2}(bcd^3)\,\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx, x, x^2\right)
\end{aligned}$$

$$= -\frac{11}{5}bcd^3\sqrt{1-c^2x^2} - \frac{1}{5}bcd^3\left(1-c^2x^2\right)^{3/2} - \frac{1}{25}bcd^3\left(1-c^2x^2\right)^{5/2} - \frac{d^3(a+b\arcsin(cx))}{x} - 3c^2d^3x(a+b\arcsin(cx)) + c^4d^3x^3(a+b\arcsin(cx)) - \frac{1}{5}c^6d^3x^5(a+b\arcsin(cx)) - \frac{(bd^3)\,\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{c}$$

$$= -\frac{11}{5}bcd^3\sqrt{1-c^2x^2} - \frac{1}{5}bcd^3\left(1-c^2x^2\right)^{3/2} - \frac{1}{25}bcd^3\left(1-c^2x^2\right)^{5/2} - \frac{d^3(a+b\arcsin(cx))}{x} - 3c^2d^3x(a+b\arcsin(cx)) + c^4d^3x^3(a+b\arcsin(cx)) - \frac{1}{5}c^6d^3x^5(a+b\arcsin(cx)) - bcd^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.75

$$\int \frac{\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))}{x^2}\,dx = \frac{1}{10}d^3\left(-\frac{10(a+b\arcsin(cx))}{x} - 30c^2x(a+b\arcsin(cx)) + 10c^4x^3(a+b\arcsin(cx)) - 2c^6x^5(a+b\arcsin(cx)) - \frac{2}{5}bc\left(\sqrt{1-c^2x^2}\left(61-7c^2x^2+c^4x^4\right) + 25\text{arctanh}\left(\sqrt{1-c^2x^2}\right)\right)\right)$$

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (d^3*((-10*(a + b*ArcSin[c*x]))/x - 30*c^2*x*(a + b*ArcSin[c*x]) + 10*c^4*x
^3*(a + b*ArcSin[c*x]) - 2*c^6*x^5*(a + b*ArcSin[c*x]) - (2*b*c*(Sqrt[1 - c
^2*x^2]*(61 - 7*c^2*x^2 + c^4*x^4) + 25*ArcTanh[Sqrt[1 - c^2*x^2]]))/5))/10
```

Maple [A] (verified)

Time = 0.05 (sec) , antiderivative size = 152, normalized size of antiderivative = 0.93

method	result
parts	$-d^3a\left(\frac{c^6x^5}{5}-c^4x^3+3c^2x+\frac{1}{x}\right)-d^3bc\left(\frac{\arcsin(cx)c^5x^5}{5}-c^3x^3\arcsin(cx)+3cx\arcsin(cx)\right.$
derivativedivides	$c\left(-d^3a\left(\frac{c^5x^5}{5}-c^3x^3+3cx+\frac{1}{cx}\right)-d^3b\left(\frac{\arcsin(cx)c^5x^5}{5}-c^3x^3\arcsin(cx)+3cx\arcsin(c\right.\right.$
default	$c\left(-d^3a\left(\frac{c^5x^5}{5}-c^3x^3+3cx+\frac{1}{cx}\right)-d^3b\left(\frac{\arcsin(cx)c^5x^5}{5}-c^3x^3\arcsin(cx)+3cx\arcsin(c\right.\right.$

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -d^3*a*(1/5*c^6*x^5-c^4*x^3+3*c^2*x+1/x)-d^3*b*c*(1/5*arcsin(c*x)*c^5*x^5-c
^3*x^3*arcsin(c*x)+3*c*x*arcsin(c*x)+1/c/x*arcsin(c*x)+1/25*c^4*x^4*(-c^2*x
^2+1)^(1/2)-7/25*c^2*x^2*(-c^2*x^2+1)^(1/2)+61/25*(-c^2*x^2+1)^(1/2)+arctan
h(1/(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.15

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))}{x^2}\,dx = -\frac{10\,ac^6d^3x^6 - 50\,ac^4d^3x^4 + 150\,ac^2d^3x^2 + 25\,bcd^3x\log\left(\sqrt{-c^2x^2+1}+1\right) - 25\,bcd^3x\log\left(\sqrt{-c^2x^2+1}-1\right.}{}$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] -1/50*(10*a*c^6*d^3*x^6 - 50*a*c^4*d^3*x^4 + 150*a*c^2*d^3*x^2 + 25*b*c*d^3
*x*log(sqrt(-c^2*x^2 + 1) + 1) - 25*b*c*d^3*x*log(sqrt(-c^2*x^2 + 1) - 1) +
 50*a*d^3 + 10*(b*c^6*d^3*x^6 - 5*b*c^4*d^3*x^4 + 15*b*c^2*d^3*x^2 + 5*b*d^
3)*arcsin(c*x) + 2*(b*c^5*d^3*x^5 - 7*b*c^3*d^3*x^3 + 61*b*c*d^3*x)*sqrt(-c
^2*x^2 + 1))/x
```

Sympy [A] (verification not implemented)

Time = 3.07 (sec) , antiderivative size = 291, normalized size of antiderivative = 1.77

$$\begin{aligned}
&\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))}{x^2}\,dx \\
&= -\frac{ac^6d^3x^5}{5} + ac^4d^3x^3 - 3ac^2d^3x - \frac{ad^3}{x} \\
&+ \frac{bc^7d^3\left(\begin{cases} -\frac{x^4\sqrt{-c^2x^2+1}}{5c^2} - \frac{4x^2\sqrt{-c^2x^2+1}}{15c^4} - \frac{8\sqrt{-c^2x^2+1}}{15c^6} & \text{for}\: c^2 \neq 0 \\ \frac{x^6}{6} & \text{otherwise} \end{cases}\right)}{5} \\
&- \frac{bc^6d^3x^5\,\mathrm{asin}\,(cx)}{5} - bc^5d^3\left(\begin{cases} -\frac{x^2\sqrt{-c^2x^2+1}}{3c^2} - \frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for}\: c^2 \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}\right) \\
&+ bc^4d^3x^3\,\mathrm{asin}\,(cx) - 3bc^2d^3\left(\begin{cases} 0 & \text{for}\: c = 0 \\ x\,\mathrm{asin}\,(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise} \end{cases}\right) \\
&+ bcd^3\left(\begin{cases} -\mathrm{acosh}\,\left(\frac{1}{cx}\right) & \text{for}\: \frac{1}{|c^2x^2|} > 1 \\ i\,\mathrm{asin}\,\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) - \frac{bd^3\,\mathrm{asin}\,(cx)}{x}
\end{aligned}$$

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*c**6*d**3*x**5/5 + a*c**4*d**3*x**3 - 3*a*c**2*d**3*x - a*d**3/x + b*c**
7*d**3*Piecewise((-x**4*sqrt(-c**2*x**2 + 1)/(5*c**2) - 4*x**2*sqrt(-c**2*x
**2 + 1)/(15*c**4) - 8*sqrt(-c**2*x**2 + 1)/(15*c**6), Ne(c**2, 0)), (x**6/
6, True))/5 - b*c**6*d**3*x**5*asin(c*x)/5 - b*c**5*d**3*Piecewise((-x**2*s
qrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 + 1)/(3*c**4), Ne(c**2, 0)
), (x**4/4, True)) + b*c**4*d**3*x**3*asin(c*x) - 3*b*c**2*d**3*Piecewise((
0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True)) + b*c*d**3*Piec
ewise((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b
*d**3*asin(c*x)/x
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.52

$$\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))}{x^2}\,dx = -\frac{1}{5}\,ac^6d^3x^5 - \frac{1}{75}\left(15\,x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bc^6d^3 + ac^4d^3x^3 + \frac{1}{3}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bc^4d^3 - 3\,ac^2d^3x - 3\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bcd^3 - \left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\arcsin(cx)}{x}\right)bd^3 - \frac{ad^3}{x}$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] -1/5*a*c^6*d^3*x^5 - 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c
^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*c^6*d^3
+ a*c^4*d^3*x^3 + 1/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 +
2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^4*d^3 - 3*a*c^2*d^3*x - 3*(c*x*arcsin(c*x) +
 sqrt(-c^2*x^2 + 1))*b*c*d^3 - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x
)) + arcsin(c*x)/x)*b*d^3 - a*d^3/x
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 5513 vs. $2(148) = 296$.

Time = 29.09 (sec) , antiderivative size = 5513, normalized size of antiderivative = 33.62

$$\int \frac{(d - c^2dx^2)^3 (a + b \arcsin(cx))}{x^2} \, dx = \text{Too large to display}$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^13*d^3*x^12*arcsin(c*x)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 +
5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^
7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) +
 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^12) - 1/2*a*
c^13*d^3*x^12/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^
2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-
c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^12) + b*c^12*d^3*x^11*log(abs(c
)*abs(x))/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^
2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c
^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*
x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) - b*c^12*d^3*x^11*log(sqrt(-c^2
*x^2 + 1) + 1)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c
^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sq
rt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(
-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) + 61/25*b*c^12*d^3*x^11/((
c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^
9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1)
+ 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1
))*(sqrt(-c^2*x^2 + 1) + 1)^11) - 9*b*c^11*d^3*x^10*arcsin(c*x)/((c^11*x^11
/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^
7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(
-c^2*x^2 + 1) + 1)^10) - 9*a*c^11*d^3*x^10/((c^11*x^11/(sqrt(-c^2*x^2 + 1)
+ 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2
+ 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*
x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^10
) + 5*b*c^10*d^3*x^9*log(abs(c)*abs(x))/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1
)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1
) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2
 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) -
5*b*c^10*d^3*x^9*log(sqrt(-c^2*x^2 + 1) + 1)/((c^11*x^11/(sqrt(-c^2*x^2 + 1
) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^
2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^
2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^
```

9) + 31/5*b*c^10*d^3*x^9/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) - 47/2*b*c^9*d^3*x^8*arcsin(c*x)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) - 47/2*a*c^9*d^3*x^8/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) + 10*b*c^8*d^3*x^7*log(abs(c)*abs(x))/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^7) - 10*b*c^8*d^3*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^7) + 22/5*b*c^8*d^3*x^7/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^7) - 182/5*b*c^7*d^3*x^6*arcsin(c*x)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) - 182/5*a*c^7*d^3*x^6/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 10*b*c^6*d^3*x^5*log(abs(c)*abs(x))/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 10*b*c^6*d^3*x^5*log(sqrt(-c^2*x^2 + 1) + 1)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 22/5*b*c^6*d^3*x^5/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 47/2*b*c^5*d^3*x^4*arcsin(c*x)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^

```
5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(s
qrt(-c^2*x^2 + 1) + 1)^4) - 47/2*a*c^5*d^3*x^4/((c^11*x^11/(sqrt(-c^2*x^2 +
 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*
x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1
)^4) + 5*b*c^4*d^3*x^3*log(abs(c)*abs(x))/((c^11*x^11/(sqrt(-c^2*x^2 + 1) +
 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 +
 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x
^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3)
- 5*b*c^4*d^3*x^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^11*x^11/(sqrt(-c^2*x^2 +
1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x
^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c
^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)
^3) - 31/5*b*c^4*d^3*x^3/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^
9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c
^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 9*b*c^3*d^3*x^2
*arcsin(c*x)/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2
*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt
(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c
^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 9*a*c^3*d^3*x^2/((c^11*x^11
/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^
7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(
-c^2*x^2 + 1) + 1)^2) + b*c^2*d^3*x*log(abs(c)*abs(x))/((c^11*x^11/(sqrt(-c
^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sq
rt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2
+ 1) + 1)) - b*c^2*d^3*x*log(sqrt(-c^2*x^2 + 1) + 1)/((c^11*x^11/(sqrt(-c^2
*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt
(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(
sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
1) + 1)) - 61/25*b*c^2*d^3*x/((c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^
9*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 +
10*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^
3 + c*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - 1/2*b*c*d^3*a
rcsin(c*x)/(c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9*x^9/(sqrt(-c^2*x^
2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^5*x^5/(sqrt(-c
^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c*x/(sqrt(-c^2*
x^2 + 1) + 1)) - 1/2*a*c*d^3/(c^11*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^9
*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^7*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 1
0*c^5*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^3*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3
 + c*x/(sqrt(-c^2*x^2 + 1) + 1))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^3\,(a+b\arcsin(cx))}{x^2}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^3}{x^2}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x^2,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x^2, x)
```

3.26 $\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))}{x^3}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 263

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))}{x^3}\,dx = \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2}-\frac{7}{16}bc^3d^3x(1-c^2x^2)^{3/2} - \frac{bcd^3(1-c^2x^2)^{5/2}}{2x}+\frac{3}{32}bc^2d^3\arcsin(cx) - \frac{3}{2}c^2d^3(1-c^2x^2)(a+b\arcsin(cx)) - \frac{3}{4}c^2d^3(1-c^2x^2)^2(a+b\arcsin(cx)) - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))}{2x^2} + \frac{3ic^2d^3(a+b\arcsin(cx))^2}{2b} - 3c^2d^3(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) + \frac{3}{2}ibc^2d^3\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)$$

```
[Out] -7/16*b*c^3*d^3*x*(-c^2*x^2+1)^(3/2)-1/2*b*c*d^3*(-c^2*x^2+1)^(5/2)/x+3/32*
b*c^2*d^3*arcsin(c*x)-3/2*c^2*d^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))-3/4*c^2*d^
3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))-1/2*d^3*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))
/x^2+3/2*I*c^2*d^3*(a+b*arcsin(c*x))^2/b-3*c^2*d^3*(a+b*arcsin(c*x))*ln(1-(
I*c*x+(-c^2*x^2+1)^(1/2))^2)+3/2*I*b*c^2*d^3*polylog(2,(I*c*x+(-c^2*x^2+1)^
(1/2))^2)+3/32*b*c^3*d^3*x*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4775, 283, 201, 222, 4773, 4721, 3798, 2221, 2317, 2438}

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))}{x^3} \, dx = -\frac{d^3(1-c^2x^2)^3 (a+b\arcsin(cx))}{2x^2} - \frac{3}{4}c^2d^3(1-c^2x^2)^2 (a+b\arcsin(cx)) - \frac{3}{2}c^2d^3(1-c^2x^2) (a+b\arcsin(cx)) + \frac{3ic^2d^3(a+b\arcsin(cx))^2}{2b} - 3c^2d^3\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx)) + \frac{3}{2}ibc^2d^3\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) + \frac{3}{32}bc^2d^3\arcsin(cx) - \frac{bcd^3(1-c^2x^2)^{5/2}}{2x} - \frac{7}{16}bc^3d^3x(1-c^2x^2)^{3/2} + \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2}$$

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] (3*b*c^3*d^3*x*Sqrt[1 - c^2*x^2])/32 - (7*b*c^3*d^3*x*(1 - c^2*x^2)^(3/2))/
16 - (b*c*d^3*(1 - c^2*x^2)^(5/2))/(2*x) + (3*b*c^2*d^3*ArcSin[c*x])/32 - (
3*c^2*d^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/2 - (3*c^2*d^3*(1 - c^2*x^2)^2
*(a + b*ArcSin[c*x]))/4 - (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(2*x^2)
 + (((3*I)/2)*c^2*d^3*(a + b*ArcSin[c*x])^2)/b - 3*c^2*d^3*(a + b*ArcSin[c*
x])*Log[1 - E^((2*I)*ArcSin[c*x])] + ((3*I)/2)*b*c^2*d^3*PolyLog[2, E^((2*I
)*ArcSin[c*x])]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 283

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^p/(c*(m + 1))), x] - Dist[b*n*(p/(c^n*(m + 1))), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcSin[c*x
])/(f*(m + 1))), x] + (-Dist[b*c*(d^p/(f*(m + 1))), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{d^3(1-c^2x^2)^3\,(a+b\arcsin(cx))}{2x^2} \\
&\quad -\left(3c^2d\right)\int \frac{(d-c^2dx^2)^2\,(a+b\arcsin(cx))}{x}\,dx+\frac{1}{2}\left(bcd^3\right)\int \frac{(1-c^2x^2)^{5/2}}{x^2}\,dx \\
&= -\frac{bcd^3(1-c^2x^2)^{5/2}}{2x}-\frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) \\
&\quad -\frac{d^3(1-c^2x^2)^3\,(a+b\arcsin(cx))}{2x^2}-\left(3c^2d^2\right)\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))}{x}\,dx \\
&\quad +\frac{1}{4}\left(3bc^3d^3\right)\int \left(1-c^2x^2\right)^{3/2}dx-\frac{1}{2}\left(5bc^3d^3\right)\int \left(1-c^2x^2\right)^{3/2}dx \\
&= -\frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2}-\frac{bcd^3(1-c^2x^2)^{5/2}}{2x}-\frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b\arcsin(cx)) \\
&\quad -\frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))-\frac{d^3(1-c^2x^2)^3\,(a+b\arcsin(cx))}{2x^2} \\
&\quad -\left(3c^2d^3\right)\int \frac{a+b\arcsin(cx)}{x}\,dx+\frac{1}{16}\left(9bc^3d^3\right)\int \sqrt{1-c^2x^2}\,dx \\
&\quad +\frac{1}{2}\left(3bc^3d^3\right)\int \sqrt{1-c^2x^2}\,dx-\frac{1}{8}\left(15bc^3d^3\right)\int \sqrt{1-c^2x^2}\,dx \\
&= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2}-\frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} \\
&\quad -\frac{bcd^3(1-c^2x^2)^{5/2}}{2x}-\frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b\arcsin(cx)) \\
&\quad -\frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))-\frac{d^3(1-c^2x^2)^3\,(a+b\arcsin(cx))}{2x^2} \\
&\quad -\left(3c^2d^3\right)\text{Subst}\left(\int (a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)+\frac{1}{32}\left(9bc^3d^3\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx \\
&\quad +\frac{1}{4}\left(3bc^3d^3\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{16}\left(15bc^3d^3\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx
\end{aligned}
$$

$$= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2} - \frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}}{2x} + \frac{3}{32}bc^2d^3\arcsin(cx) - \frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b\arcsin(cx)) - \frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) - \frac{d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))}{2x^2} + \frac{3ic^2d^3(a+b\arcsin(cx))^2}{2b} + \left(6ic^2d^3\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)$$

$$= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2} - \frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}}{2x} + \frac{3}{32}bc^2d^3\arcsin(cx) - \frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b\arcsin(cx)) - \frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) - \frac{d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))}{2x^2} + \frac{3ic^2d^3(a+b\arcsin(cx))^2}{2b} - 3c^2d^3(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) + \left(3bc^2d^3\right)\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)$$

$$= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2} - \frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}}{2x} + \frac{3}{32}bc^2d^3\arcsin(cx) - \frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b\arcsin(cx)) - \frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) - \frac{d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))}{2x^2} + \frac{3ic^2d^3(a+b\arcsin(cx))^2}{2b} - 3c^2d^3(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) - \frac{1}{2}\left(3ibc^2d^3\right)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)$$

$$= \frac{3}{32}bc^3d^3x\sqrt{1-c^2x^2} - \frac{7}{16}bc^3d^3x\left(1-c^2x^2\right)^{3/2} - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}}{2x} + \frac{3}{32}bc^2d^3\arcsin(cx) - \frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b\arcsin(cx)) - \frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx)) - \frac{d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))}{2x^2} + \frac{3ic^2d^3(a+b\arcsin(cx))^2}{2b} - 3c^2d^3(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right) + \frac{3}{2}ibc^2d^3\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.37 (sec) , antiderivative size = 226, normalized size of antiderivative = 0.86

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))}{x^3} dx =$$

$$-\frac{d^3\left(16a-48ac^4x^4+8ac^6x^6+16bcx\sqrt{1-c^2x^2}-21bc^3x^3\sqrt{1-c^2x^2}+2bc^5x^5\sqrt{1-c^2x^2}-48ibc^2x^2\operatorname{arcs}\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/32*(d^3*(16*a - 48*a*c^4*x^4 + 8*a*c^6*x^6 + 16*b*c*x*Sqrt[1 - c^2*x^2]
- 21*b*c^3*x^3*Sqrt[1 - c^2*x^2] + 2*b*c^5*x^5*Sqrt[1 - c^2*x^2] - (48*I)*b
*c^2*x^2*ArcSin[c*x]^2 + 42*b*c^2*x^2*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])
] + 8*b*ArcSin[c*x]*(2 - 6*c^4*x^4 + c^6*x^6 + 12*c^2*x^2*Log[1 - E^((2*I)*
ArcSin[c*x])]) + 96*a*c^2*x^2*Log[x] - (48*I)*b*c^2*x^2*PolyLog[2, E^((2*I)
*ArcSin[c*x])]))/x^2
```

Maple [A] (verified)

Time = 0.21 (sec) , antiderivative size = 293, normalized size of antiderivative = 1.11

method	result
parts	$-d^3a\left(\frac{c^6x^4}{4}-\frac{3c^4x^2}{2}+\frac{1}{2x^2}+3c^2\ln(x)\right)-d^3b\,c^2\left(-\frac{3i\arcsin(cx)^2}{2}-\frac{5(i+2\arcsin(cx))\left(2c^2x^2-2icx\sqrt{}\right.}{32}\right.$
derivativedivides	$c^2\left(-d^3a\left(\frac{c^4x^4}{4}-\frac{3c^2x^2}{2}+\frac{1}{2c^2x^2}+3\ln(cx)\right)+\frac{3id^3b\arcsin(cx)^2}{2}+\frac{5bc\,d^3x\sqrt{-c^2x^2+1}}{8}+\frac{5d^3b\arcsin(}{4}\right.$
default	$c^2\left(-d^3a\left(\frac{c^4x^4}{4}-\frac{3c^2x^2}{2}+\frac{1}{2c^2x^2}+3\ln(cx)\right)+\frac{3id^3b\arcsin(cx)^2}{2}+\frac{5bc\,d^3x\sqrt{-c^2x^2+1}}{8}+\frac{5d^3b\arcsin(}{4}\right.$

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -d^3*a*(1/4*c^6*x^4-3/2*c^4*x^2+1/2/x^2+3*c^2*ln(x))-d^3*b*c^2*(-3/2*I*arcs
in(c*x)^2-5/32*(I+2*arcsin(c*x))*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)-5
/32*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*(-I+2*arcsin(c*x))+1/2*(-I*c^2
*x^2+c*x*(-c^2*x^2+1)^(1/2)+arcsin(c*x))/c^2/x^2+3*arcsin(c*x)*ln(1+I*c*x+(
-c^2*x^2+1)^(1/2))+3*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-3*I*polylog
(2,-I*c*x-(-c^2*x^2+1)^(1/2))-3*I*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+1/32*
arcsin(c*x)*cos(4*arcsin(c*x))-1/128*sin(4*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))}{x^3} dx = \int -\frac{(c^2dx^2-d)^3 (b\arcsin(cx)+a)}{x^3} dx$$

[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")

[Out] integral(-(a*c^6*d^3*x^6 - 3*a*c^4*d^3*x^4 + 3*a*c^2*d^3*x^2 - a*d^3 + (b*c^6*d^3*x^6 - 3*b*c^4*d^3*x^4 + 3*b*c^2*d^3*x^2 - b*d^3)*arcsin(c*x))/x^3, x)

Sympy [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))}{x^3} dx = -d^3 \left(\int \left(-\frac{a}{x^3}\right) dx + \int \frac{3ac^2}{x} dx + \int (-3ac^4x)\, dx + \int ac^6x^3\, dx + \int \left(-\frac{b\operatorname{asin}(cx)}{x^3}\right) dx + \int \frac{3bc^2\operatorname{asin}(cx)}{x} dx + \int (-3bc^4x\operatorname{asin}(cx))\, dx + \int bc^6x^3\operatorname{asin}(cx)\, dx \right)$$

[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))/x**3,x)

[Out] -d**3*(Integral(-a/x**3, x) + Integral(3*a*c**2/x, x) + Integral(-3*a*c**4*x, x) + Integral(a*c**6*x**3, x) + Integral(-b*asin(c*x)/x**3, x) + Integral(3*b*c**2*asin(c*x)/x, x) + Integral(-3*b*c**4*x*asin(c*x), x) + Integral(b*c**6*x**3*asin(c*x), x))

Maxima [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))}{x^3} dx = \int -\frac{(c^2dx^2-d)^3 (b\arcsin(cx)+a)}{x^3} dx$$

[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")

[Out] -1/4*a*c^6*d^3*x^4 + 3/2*a*c^4*d^3*x^2 - 3*a*c^2*d^3*log(x) - 1/2*b*d^3*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) - 1/2*a*d^3/x^2 - integrate((b*c^6*d^3*x^4 - 3*b*c^4*d^3*x^2 + 3*b*c^2*d^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)

Giac [F]

$$\int \frac{(d-c^2dx^2)^3\,(a+b\arcsin(cx))}{x^3}\,dx = \int -\frac{(c^2dx^2-d)^3(b\arcsin{(cx)}+a)}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)/x^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^3\,(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^3}{x^3}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x^3,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x^3, x)
```

3.27 $\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))}{x^4}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 178

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))}{x^4}\,dx = \frac{8}{3}bc^3d^3\sqrt{1-c^2x^2}-\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} + \frac{1}{9}bc^3d^3(1-c^2x^2)^{3/2}-\frac{d^3(a+b\arcsin(cx))}{3x^3} + \frac{3c^2d^3(a+b\arcsin(cx))}{x} + 3c^4d^3x(a+b\arcsin(cx))-\frac{1}{3}c^6d^3x^3(a+b\arcsin(cx)) + \frac{17}{6}bc^3d^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] 1/9*b*c^3*d^3*(-c^2*x^2+1)^(3/2)-1/3*d^3*(a+b*arcsin(c*x))/x^3+3*c^2*d^3*(a
+b*arcsin(c*x))/x+3*c^4*d^3*x*(a+b*arcsin(c*x))-1/3*c^6*d^3*x^3*(a+b*arcsin
(c*x))+17/6*b*c^3*d^3*arctanh((-c^2*x^2+1)^(1/2))+8/3*b*c^3*d^3*(-c^2*x^2+1
)^(1/2)-1/6*b*c*d^3*(-c^2*x^2+1)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used

= {276, 4777, 12, 1813, 1635, 911, 1167, 214}

$$\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))}{x^4}\,dx = -\frac{1}{3}c^6d^3x^3(a+b\arcsin(cx))+3c^4d^3x(a+b\arcsin(cx)) + \frac{3c^2d^3(a+b\arcsin(cx))}{x} - \frac{d^3(a+b\arcsin(cx))}{3x^3} + \frac{17}{6}bc^3d^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right) - \frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} + \frac{1}{9}bc^3d^3(1-c^2x^2)^{3/2} + \frac{8}{3}bc^3d^3\sqrt{1-c^2x^2}$$

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (8*b*c^3*d^3*Sqrt[1 - c^2*x^2])/3 - (b*c*d^3*Sqrt[1 - c^2*x^2])/(6*x^2) + (
b*c^3*d^3*(1 - c^2*x^2)^(3/2))/9 - (d^3*(a + b*ArcSin[c*x]))/(3*x^3) + (3*c
^2*d^3*(a + b*ArcSin[c*x]))/x + 3*c^4*d^3*x*(a + b*ArcSin[c*x]) - (c^6*d^3*
x^3*(a + b*ArcSin[c*x]))/3 + (17*b*c^3*d^3*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
```

```
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1635

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :
> With[{Qx = PolynomialQuotient[Px, a + b*x, x], R = PolynomialRemainder[Px
, a + b*x, x]}, Simp[R*(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((m + 1)*(b*c -
 a*d))), x] + Dist[1/((m + 1)*(b*c - a*d)), Int[(a + b*x)^(m + 1)*(c + d*x)
^n*ExpandToSum[(m + 1)*(b*c - a*d)*Qx - d*R*(m + n + 2), x], x], x]] /; Fre
eQ[{a, b, c, d, n}, x] && PolyQ[Px, x] && ILtQ[m, -1] && GtQ[Expon[Px, x],
2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^3(a+b\arcsin(cx))}{3x^3}+\frac{3c^2d^3(a+b\arcsin(cx))}{x}+3c^4d^3x(a+b\arcsin(cx)) \\
&\quad -\frac{1}{3}c^6d^3x^3(a+b\arcsin(cx))-(bc)\int\frac{d^3(-1+9c^2x^2+9c^4x^4-c^6x^6)}{3x^3\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d^3(a+b\arcsin(cx))}{3x^3}+\frac{3c^2d^3(a+b\arcsin(cx))}{x}+3c^4d^3x(a+b\arcsin(cx)) \\
&\quad -\frac{1}{3}c^6d^3x^3(a+b\arcsin(cx))-\frac{1}{3}\left(bcd^3\right)\int\frac{-1+9c^2x^2+9c^4x^4-c^6x^6}{x^3\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d^3(a+b\arcsin(cx))}{3x^3}+\frac{3c^2d^3(a+b\arcsin(cx))}{x}+3c^4d^3x(a \\
&\qquad +b\arcsin(cx))-\frac{1}{3}c^6d^3x^3(a+b\arcsin(cx)) \\
&\quad -\frac{1}{6}\left(bcd^3\right)\text{Subst}\left(\int\frac{-1+9c^2x+9c^4x^2-c^6x^3}{x^2\sqrt{1-c^2x}}\,dx,x,x^2\right)
\end{aligned}$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} - \frac{d^3(a+b\arcsin(cx))}{3x^3} + \frac{3c^2d^3(a+b\arcsin(cx))}{x} + 3c^4d^3x(a+b\arcsin(cx)) - \frac{1}{3}c^6d^3x^3(a+b\arcsin(cx)) + \frac{1}{6}(bcd^3)\,\text{Subst}\left(\int \frac{-\frac{17c^2}{2} - 9c^4x + c^6x^2}{x\sqrt{1-c^2x}}\,dx, x, x^2\right)$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} - \frac{d^3(a+b\arcsin(cx))}{3x^3} + \frac{3c^2d^3(a+b\arcsin(cx))}{x} + 3c^4d^3x(a+b\arcsin(cx)) - \frac{1}{3}c^6d^3x^3(a+b\arcsin(cx)) - \frac{(bd^3)\,\text{Subst}\left(\int \frac{-\frac{33c^2}{2}+7c^2x^2+c^2x^4}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{3c}$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} - \frac{d^3(a+b\arcsin(cx))}{3x^3} + \frac{3c^2d^3(a+b\arcsin(cx))}{x} + 3c^4d^3x(a+b\arcsin(cx)) - \frac{1}{3}c^6d^3x^3(a+b\arcsin(cx)) - \frac{(bd^3)\,\text{Subst}\left(\int \left(-8c^4 - c^4x^2 - \frac{17c^2}{2\left(\frac{1}{c^2}-\frac{x^2}{c^2}\right)}\right)dx, x, \sqrt{1-c^2x^2}\right)}{3c}$$

$$= \frac{8}{3}bc^3d^3\sqrt{1-c^2x^2} - \frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} + \frac{1}{9}bc^3d^3\left(1-c^2x^2\right)^{3/2} - \frac{d^3(a+b\arcsin(cx))}{3x^3} + \frac{3c^2d^3(a+b\arcsin(cx))}{x} + 3c^4d^3x(a+b\arcsin(cx)) - \frac{1}{3}c^6d^3x^3(a+b\arcsin(cx)) + \frac{1}{6}(17bcd^3)\,\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)$$

$$= \frac{8}{3}bc^3d^3\sqrt{1-c^2x^2} - \frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} + \frac{1}{9}bc^3d^3\left(1-c^2x^2\right)^{3/2} - \frac{d^3(a+b\arcsin(cx))}{3x^3} + \frac{3c^2d^3(a+b\arcsin(cx))}{x} + 3c^4d^3x(a+b\arcsin(cx)) - \frac{1}{3}c^6d^3x^3(a+b\arcsin(cx)) + \frac{17}{6}bc^3d^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 162, normalized size of antiderivative = 0.91

$$\int \frac{(d-c^2dx^2)^3\,(a+b\arcsin(cx))}{x^4}\,dx$$

$$= \frac{d^3\left(-6a+54ac^2x^2+54ac^4x^4-6ac^6x^6-3bcx\sqrt{1-c^2x^2}+50bc^3x^3\sqrt{1-c^2x^2}-2bc^5x^5\sqrt{1-c^2x^2}-6b(1\right.}{18x^3}$$

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (d^3*(-6*a + 54*a*c^2*x^2 + 54*a*c^4*x^4 - 6*a*c^6*x^6 - 3*b*c*x*Sqrt[1 - c
^2*x^2] + 50*b*c^3*x^3*Sqrt[1 - c^2*x^2] - 2*b*c^5*x^5*Sqrt[1 - c^2*x^2] -
6*b*(1 - 9*c^2*x^2 - 9*c^4*x^4 + c^6*x^6)*ArcSin[c*x] + 51*b*c^3*x^3*ArcTan
h[Sqrt[1 - c^2*x^2]]))/(18*x^3)
```

Maple [A] (verified)

Time = 0.06 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.89

method	result
parts	$-d^3a\left(\frac{c^6x^3}{3}-3c^4x-\frac{3c^2}{x}+\frac{1}{3x^3}\right)-d^3b\,c^3\left(\frac{c^3x^3\arcsin(cx)}{3}-3cx\arcsin\left(cx\right)+\frac{\arcsin(cx)}{3c^3x^3}-\frac{3\,\mathrm{arc}}{}\right.$
derivativedivides	$c^3\left(-d^3a\left(\frac{c^3x^3}{3}-3cx+\frac{1}{3c^3x^3}-\frac{3}{cx}\right)-d^3b\left(\frac{c^3x^3\arcsin(cx)}{3}-3cx\arcsin\left(cx\right)+\frac{\arcsin(cx)}{3c^3x^3}-\frac{3\,a}{}\right.\right.$
default	$c^3\left(-d^3a\left(\frac{c^3x^3}{3}-3cx+\frac{1}{3c^3x^3}-\frac{3}{cx}\right)-d^3b\left(\frac{c^3x^3\arcsin(cx)}{3}-3cx\arcsin\left(cx\right)+\frac{\arcsin(cx)}{3c^3x^3}-\frac{3\,a}{}\right.\right.$

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -d^3*a*(1/3*c^6*x^3-3*c^4*x-3*c^2/x+1/3/x^3)-d^3*b*c^3*(1/3*c^3*x^3*arcsin(
c*x)-3*c*x*arcsin(c*x)+1/3/c^3/x^3*arcsin(c*x)-3/c/x*arcsin(c*x)+1/9*c^2*x^
2*(-c^2*x^2+1)^(1/2)-25/9*(-c^2*x^2+1)^(1/2)+1/6/c^2/x^2*(-c^2*x^2+1)^(1/2)
-17/6*arctanh(1/(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 196, normalized size of antiderivative = 1.10

$$\int \frac{(d-c^2dx^2)^3\,(a+b\arcsin(cx))}{x^4}\,dx =$$
$$-\frac{12\,ac^6d^3x^6-108\,ac^4d^3x^4-51\,bc^3d^3x^3\log\left(\sqrt{-c^2x^2+1}+1\right)+51\,bc^3d^3x^3\log\left(\sqrt{-c^2x^2+1}-1\right)-108\,a}{}$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] -1/36*(12*a*c^6*d^3*x^6 - 108*a*c^4*d^3*x^4 - 51*b*c^3*d^3*x^3*log(sqrt(-c^
2*x^2 + 1) + 1) + 51*b*c^3*d^3*x^3*log(sqrt(-c^2*x^2 + 1) - 1) - 108*a*c^2*
d^3*x^2 + 12*a*d^3 + 12*(b*c^6*d^3*x^6 - 9*b*c^4*d^3*x^4 - 9*b*c^2*d^3*x^2
+ b*d^3)*arcsin(c*x) + 2*(2*b*c^5*d^3*x^5 - 50*b*c^3*d^3*x^3 + 3*b*c*d^3*x)
*sqrt(-c^2*x^2 + 1))/x^3
```

Sympy [A] (verification not implemented)

Time = 3.89 (sec) , antiderivative size = 326, normalized size of antiderivative = 1.83

$$\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))}{x^4}\,dx$$

$$= -\frac{ac^6d^3x^3}{3} + 3ac^4d^3x + \frac{3ac^2d^3}{x} - \frac{ad^3}{3x^3} + \frac{bc^7d^3\left(\begin{cases} -\frac{x^2\sqrt{-c^2x^2+1}}{3c^2} - \frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for}\ c^2 \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}\right)}{3}$$
$$- \frac{bc^6d^3x^3\operatorname{asin}(cx)}{3} + 3bc^4d^3\left(\begin{cases} 0 & \text{for}\ c = 0 \\ x\operatorname{asin}(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise} \end{cases}\right)$$
$$- 3bc^3d^3\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for}\ \frac{1}{|c^2x^2|} > 1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) + \frac{3bc^2d^3\operatorname{asin}(cx)}{x}$$
$$+ \frac{bcd^3\left(\begin{cases} -\frac{c^2\operatorname{acosh}\left(\frac{1}{cx}\right)}{2} + \frac{c}{2x\sqrt{-1+\frac{1}{c^2x^2}}} - \frac{1}{2cx^3\sqrt{-1+\frac{1}{c^2x^2}}} & \text{for}\ \frac{1}{|c^2x^2|} > 1 \\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx}\right)}{2} - \frac{ic\sqrt{1-\frac{1}{c^2x^2}}}{2x} & \text{otherwise} \end{cases}\right)}{3} - \frac{bd^3\operatorname{asin}(cx)}{3x^3}$$

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))/x**4,x)
```

```
[Out] -a*c**6*d**3*x**3/3 + 3*a*c**4*d**3*x + 3*a*c**2*d**3/x - a*d**3/(3*x**3) +
 b*c**7*d**3*Piecewise((-x**2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*
x**2 + 1)/(3*c**4), Ne(c**2, 0)), (x**4/4, True))/3 - b*c**6*d**3*x**3*asin
(c*x)/3 + 3*b*c**4*d**3*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**2*
x**2 + 1)/c, True)) - 3*b*c**3*d**3*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*
x**2) > 1), (I*asin(1/(c*x)), True)) + 3*b*c**2*d**3*asin(c*x)/x + b*c*d**3
*Piecewise((-c**2*acosh(1/(c*x))/2 + c/(2*x*sqrt(-1 + 1/(c**2*x**2))) - 1/(
2*c*x**3*sqrt(-1 + 1/(c**2*x**2))), 1/Abs(c**2*x**2) > 1), (I*c**2*asin(1/(
c*x))/2 - I*c*sqrt(1 - 1/(c**2*x**2))/(2*x), True))/3 - b*d**3*asin(c*x)/(3
*x**3)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 242, normalized size of antiderivative = 1.36

$$\int \frac{(d-c^2dx^2)^3\,(a+b\arcsin(cx))}{x^4}\,dx$$
$$= -\frac{1}{3}\,ac^6d^3x^3 - \frac{1}{9}\left(3\,x^3\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)bc^6d^3$$
$$+ 3\,ac^4d^3x + 3\left(cx\arcsin\left(cx\right) + \sqrt{-c^2x^2+1}\right)bc^3d^3$$
$$+ 3\left(c\log\left(\frac{2\,\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\arcsin\left(cx\right)}{x}\right)bc^2d^3$$
$$- \frac{1}{6}\left(\left(c^2\log\left(\frac{2\,\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\sqrt{-c^2x^2+1}}{x^2}\right)c + \frac{2\,\arcsin\left(cx\right)}{x^3}\right)bd^3$$
$$+ \frac{3\,ac^2d^3}{x} - \frac{ad^3}{3\,x^3}$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] -1/3*a*c^6*d^3*x^3 - 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2
 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*c^6*d^3 + 3*a*c^4*d^3*x + 3*(c*x*arcsin(c*x
) + sqrt(-c^2*x^2 + 1))*b*c^3*d^3 + 3*(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) +
2/abs(x)) + arcsin(c*x)/x)*b*c^2*d^3 - 1/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/a
bs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)/x^2)*c + 2*arcsin(c*x)/x^3)*b*d^3 +
3*a*c^2*d^3/x - 1/3*a*d^3/x^3
```

Giac [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^3\,(a+b\arcsin(cx))}{x^4}\,dx = \text{Timed out}$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))}{x^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^3}{x^4}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x^4,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^3)/x^4, x)
```

3.28 $\int \frac{x^4(a+b\arcsin(cx))}{d-c^2dx^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 172

$$\int \frac{x^4(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = -\frac{4b\sqrt{1-c^2x^2}}{3c^5d}+\frac{b(1-c^2x^2)^{3/2}}{9c^5d} -\frac{x(a+b\arcsin(cx))}{c^4d}-\frac{x^3(a+b\arcsin(cx))}{3c^2d} -\frac{2i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d} +\frac{ib\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^5d}-\frac{ib\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^5d}$$

```
[Out] 1/9*b*(-c^2*x^2+1)^(3/2)/c^5/d-x*(a+b*arcsin(c*x))/c^4/d-1/3*x^3*(a+b*arcsi
n(c*x))/c^2/d-2*I*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c^5/d+
I*b*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d-I*b*polylog(2,I*(I*c*x+(
-c^2*x^2+1)^(1/2)))/c^5/d-4/3*b*(-c^2*x^2+1)^(1/2)/c^5/d
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {4795, 4749, 4266, 2317, 2438, 267, 272, 45}

$$\int \frac{x^4(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = -\frac{2i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^5d}-\frac{x(a+b\arcsin(cx))}{c^4d} -\frac{x^3(a+b\arcsin(cx))}{3c^2d}+\frac{ib\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^5d} -\frac{ib\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^5d}+\frac{b(1-c^2x^2)^{3/2}}{9c^5d}-\frac{4b\sqrt{1-c^2x^2}}{3c^5d}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] (-4*b*Sqrt[1 - c^2*x^2])/(3*c^5*d) + (b*(1 - c^2*x^2)^(3/2))/(9*c^5*d) - (x
*(a + b*ArcSin[c*x]))/(c^4*d) - (x^3*(a + b*ArcSin[c*x]))/(3*c^2*d) - ((2*I
)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^5*d) + (I*b*PolyLog[2,
(-I)*E^(I*ArcSin[c*x])])/(c^5*d) - (I*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c
^5*d)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^3(a+b\arcsin(cx))}{3c^2d}+\frac{\int \frac{x^2(a+b\arcsin(cx))}{d-c^2dx^2}\,dx}{c^2}+\frac{b\int \frac{x^3}{\sqrt{1-c^2x^2}}\,dx}{3cd} \\
&= -\frac{x(a+b\arcsin(cx))}{c^4d}-\frac{x^3(a+b\arcsin(cx))}{3c^2d}+\frac{\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx}{c^4} \\
&\quad +\frac{b\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{c^3d}+\frac{b\text{Subst}\left(\int \frac{x}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{6cd} \\
&= -\frac{b\sqrt{1-c^2x^2}}{c^5d}-\frac{x(a+b\arcsin(cx))}{c^4d}-\frac{x^3(a+b\arcsin(cx))}{3c^2d} \\
&\quad +\frac{\text{Subst}(\int (a+bx)\sec(x)\,dx,x,\arcsin(cx))}{c^5d} \\
&\quad +\frac{b\text{Subst}\left(\int \left(\frac{1}{c^2\sqrt{1-c^2x}}-\frac{\sqrt{1-c^2x}}{c^2}\right)\,dx,x,x^2\right)}{6cd} \\
&= -\frac{4b\sqrt{1-c^2x^2}}{3c^5d}+\frac{b(1-c^2x^2)^{3/2}}{9c^5d}-\frac{x(a+b\arcsin(cx))}{c^4d} \\
&\quad -\frac{x^3(a+b\arcsin(cx))}{3c^2d}-\frac{2i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d} \\
&\quad -\frac{b\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^5d} \\
&\quad +\frac{b\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^5d}
\end{aligned}$$

$$= -\frac{4b\sqrt{1-c^2x^2}}{3c^5d} + \frac{b(1-c^2x^2)^{3/2}}{9c^5d} - \frac{x(a+b\arcsin(cx))}{c^4d} - \frac{x^3(a+b\arcsin(cx))}{3c^2d} - \frac{2i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d} + \frac{(ib)\text{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{c^5d} - \frac{(ib)\text{Subst}\left(\int \frac{\log(1+ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{c^5d}$$

$$= -\frac{4b\sqrt{1-c^2x^2}}{3c^5d} + \frac{b(1-c^2x^2)^{3/2}}{9c^5d} - \frac{x(a+b\arcsin(cx))}{c^4d} - \frac{x^3(a+b\arcsin(cx))}{3c^2d} - \frac{2i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d} + \frac{ib\,\text{PolyLog}\left(2, -ie^{i\arcsin(cx)}\right)}{c^5d} - \frac{ib\,\text{PolyLog}\left(2, ie^{i\arcsin(cx)}\right)}{c^5d}$$

Mathematica [A] (verified)

Time = 0.91 (sec) , antiderivative size = 286, normalized size of antiderivative = 1.66

$$\int \frac{x^4(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = -\frac{18acx + 6ac^3x^3 + 22b\sqrt{1-c^2x^2} + 2bc^2x^2\sqrt{1-c^2x^2} + 9ib\pi\arcsin(cx) + 18bcx\arcsin(cx) + 6bc^3x^3\arcsin}{}$$

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -1/18*(18*a*c*x + 6*a*c^3*x^3 + 22*b*Sqrt[1 - c^2*x^2] + 2*b*c^2*x^2*Sqrt[1
 - c^2*x^2] + (9*I)*b*Pi*ArcSin[c*x] + 18*b*c*x*ArcSin[c*x] + 6*b*c^3*x^3*A
rcSin[c*x] - 9*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 18*b*ArcSin[c*x]*Log[1 -
 I*E^(I*ArcSin[c*x])] - 9*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 18*b*ArcSin[c
*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 9*a*Log[1 - c*x] - 9*a*Log[1 + c*x] + 9*
b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 9*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x]
)/4]] - (18*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (18*I)*b*PolyLog[2, I
*E^(I*ArcSin[c*x])])/(c^5*d)
```

Maple [A] (verified)

Time = 0.21 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.33

method	result
derivativedivides	$\frac{-\frac{a\left(\frac{c^3x^3}{3}+cx+\frac{\ln(cx-1)}{2}-\frac{\ln(cx+1)}{2}\right)}{d}-\frac{5b\sqrt{-c^2x^2+1}}{4d}-\frac{5b\arcsin(cx)cx}{4d}-\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}+\frac{b\arcsin(cx)\ln\left(1-\right.}{}}{}$
default	$\frac{-\frac{a\left(\frac{c^3x^3}{3}+cx+\frac{\ln(cx-1)}{2}-\frac{\ln(cx+1)}{2}\right)}{d}-\frac{5b\sqrt{-c^2x^2+1}}{4d}-\frac{5b\arcsin(cx)cx}{4d}-\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}+\frac{b\arcsin(cx)\ln\left(1-\right.}{}}{}$
parts	$-\frac{a\left(\frac{\frac{1}{3}c^2x^3+x}{c^4}+\frac{\ln(cx-1)}{2c^5}-\frac{\ln(cx+1)}{2c^5}\right)}{d}-\frac{5b\sqrt{-c^2x^2+1}}{4c^5d}-\frac{5b\arcsin(cx)x}{4d\,c^4}-\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d\,c^5}$

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(-a/d*(1/3*c^3*x^3+c*x+1/2*ln(c*x-1)-1/2*ln(c*x+1))-5/4*b/d*(-c^2*x^2
+1)^(1/2)-5/4*b/d*arcsin(c*x)*c*x-b/d*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1
)^(1/2)))+b/d*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*b/d*dilog(1+
I*(I*c*x+(-c^2*x^2+1)^(1/2)))-I*b/d*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1
/36*b/d*cos(3*arcsin(c*x))+1/12*b/d*arcsin(c*x)*sin(3*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{d-c^2dx^2}\,dx=\int -\frac{(b\arcsin{(cx)}+a)x^4}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^4*arcsin(c*x) + a*x^4)/(c^2*d*x^2 - d), x)
```

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{d-c^2dx^2}\,dx=-\frac{\int \frac{ax^4}{c^2x^2-1}\,dx+\int \frac{bx^4\operatorname{asin}{(cx)}}{c^2x^2-1}\,dx}{d}$$

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a*x**4/(c**2*x**2 - 1), x) + Integral(b*x**4*asin(c*x)/(c**2*x**
2 - 1), x))/d
```

Maxima [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin{(cx)}+a)x^4}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/6*a*(2*(c^2*x^3 + 3*x)/(c^4*d) - 3*log(c*x + 1)/(c^5*d) + 3*log(c*x - 1)
/(c^5*d)) + 1/6*(6*c^5*d*integrate(-1/6*(2*c^3*x^3 + 6*c*x - 3*log(c*x + 1)
 + 3*log(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d*x^2 - c^4*d), x) -
2*(c^3*x^3 + 3*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 3*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 3*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c^5*d)
```

Giac [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin{(cx)}+a)x^4}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^4/(c^2*d*x^2 - d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \int \frac{x^4\,(a+b\,\mathrm{asin}(c\,x))}{d-c^2\,d\,x^2}\,dx$$

```
[In] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2),x)
```

```
[Out] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2), x)
```

3.29 $\int \frac{x^3(a+b\arcsin(cx))}{d-c^2dx^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 144

$$\int \frac{x^3(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = -\frac{bx\sqrt{1-c^2x^2}}{4c^3d}+\frac{b\arcsin(cx)}{4c^4d}-\frac{x^2(a+b\arcsin(cx))}{2c^2d}+\frac{i(a+b\arcsin(cx))^2}{2bc^4d}-\frac{(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d}+\frac{ib\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2c^4d}$$

```
[Out] 1/4*b*arcsin(c*x)/c^4/d-1/2*x^2*(a+b*arcsin(c*x))/c^2/d+1/2*I*(a+b*arcsin(c
*x))^2/b/c^4/d-(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^4/d+1
/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^4/d-1/4*b*x*(-c^2*x^2+1)^
(1/2)/c^3/d
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {4795, 4765, 3800, 2221, 2317, 2438, 327, 222}

$$\int \frac{x^3(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \frac{i(a+b\arcsin(cx))^2}{2bc^4d}-\frac{\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^4d}-\frac{x^2(a+b\arcsin(cx))}{2c^2d}+\frac{ib\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2c^4d}+\frac{b\arcsin(cx)}{4c^4d}-\frac{bx\sqrt{1-c^2x^2}}{4c^3d}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -1/4*(b*x*Sqrt[1 - c^2*x^2])/(c^3*d) + (b*ArcSin[c*x])/(4*c^4*d) - (x^2*(a
+ b*ArcSin[c*x]))/(2*c^2*d) + ((I/2)*(a + b*ArcSin[c*x])^2)/(b*c^4*d) - ((a
 + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c^4*d) + ((I/2)*b*PolyLo
g[2, -E^((2*I)*ArcSin[c*x])])/(c^4*d)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
```

```
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^2(a+b\arcsin(cx))}{2c^2d}+\frac{\int\frac{x(a+b\arcsin(cx))}{d-c^2dx^2}\,dx}{c^2}+\frac{b\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2cd}\\
&= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d}-\frac{x^2(a+b\arcsin(cx))}{2c^2d}\\
&\quad+\frac{\text{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{c^4d}+\frac{b\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{4c^3d}\\
&= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d}+\frac{b\arcsin(cx)}{4c^4d}-\frac{x^2(a+b\arcsin(cx))}{2c^2d}\\
&\quad+\frac{i(a+b\arcsin(cx))^2}{2bc^4d}-\frac{(2i)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{c^4d}\\
&= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d}+\frac{b\arcsin(cx)}{4c^4d}-\frac{x^2(a+b\arcsin(cx))}{2c^2d}+\frac{i(a+b\arcsin(cx))^2}{2bc^4d}\\
&\quad-\frac{(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d}+\frac{b\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{c^4d}\\
&= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d}+\frac{b\arcsin(cx)}{4c^4d}-\frac{x^2(a+b\arcsin(cx))}{2c^2d}+\frac{i(a+b\arcsin(cx))^2}{2bc^4d}\\
&\quad-\frac{(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d}-\frac{(ib)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{2c^4d}\\
&= -\frac{bx\sqrt{1-c^2x^2}}{4c^3d}+\frac{b\arcsin(cx)}{4c^4d}-\frac{x^2(a+b\arcsin(cx))}{2c^2d}+\frac{i(a+b\arcsin(cx))^2}{2bc^4d}\\
&\quad-\frac{(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d}+\frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2c^4d}
\end{aligned}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 312 vs. 2(144) = 288.

Time = 0.43 (sec) , antiderivative size = 312, normalized size of antiderivative = 2.17

$$\int \frac{x^3(a+b\arcsin(cx))}{d-c^2dx^2}\,dx =$$
$$-\frac{2ac^2x^2+bcx\sqrt{1-c^2x^2}+4ib\pi\arcsin(cx)+2bc^2x^2\arcsin(cx)-2ib\arcsin(cx)^2-2b\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x}}\right.}{}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -1/4*(2*a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2] + (4*I)*b*Pi*ArcSin[c*x] + 2*b*
c^2*x^2*ArcSin[c*x] - (2*I)*b*ArcSin[c*x]^2 - 2*b*ArcTan[(c*x)/(-1 + Sqrt[1
 - c^2*x^2])] + 8*b*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 2*b*Pi*Log[1 - I*E^(
I*ArcSin[c*x])] + 4*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b*Pi*Log
[1 + I*E^(I*ArcSin[c*x])] + 4*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] +
2*a*Log[1 - c^2*x^2] - 8*b*Pi*Log[Cos[ArcSin[c*x]/2]] + 2*b*Pi*Log[-Cos[(Pi
 + 2*ArcSin[c*x])/4]] - 2*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (4*I)*b*P
olyLog[2, (-I)*E^(I*ArcSin[c*x])] - (4*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])]
)/(c^4*d)
```

Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.11

method	result
derivativedivides	$\frac{-\frac{a\left(\frac{c^2x^2}{2}+\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}+\frac{ib\arcsin(cx)^2}{2d}-\frac{b\sqrt{-c^2x^2+1}\,cx}{4d}-\frac{b\arcsin(cx)c^2x^2}{2d}+\frac{b\arcsin(cx)}{4d}-\frac{b\arcsin(cx)\ln\left(1+\left(icx+\sqrt{-\right.\right.}}{d}}{c^4}$
default	$\frac{-\frac{a\left(\frac{c^2x^2}{2}+\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}+\frac{ib\arcsin(cx)^2}{2d}-\frac{b\sqrt{-c^2x^2+1}\,cx}{4d}-\frac{b\arcsin(cx)c^2x^2}{2d}+\frac{b\arcsin(cx)}{4d}-\frac{b\arcsin(cx)\ln\left(1+\left(icx+\sqrt{-\right.\right.}}{d}}{c^4}$
parts	$-\frac{a\,x^2}{2d\,c^2}-\frac{a\ln(c^2x^2-1)}{2d\,c^4}+\frac{ib\arcsin(cx)^2}{2d\,c^4}-\frac{bx\sqrt{-c^2x^2+1}}{4c^3d}-\frac{b\arcsin(cx)x^2}{2d\,c^2}+\frac{b\arcsin(cx)}{4c^4d}-\frac{b\arcsin(cx)\ln\left(1\right.}{}$

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(-a/d*(1/2*c^2*x^2+1/2*ln(c*x-1)+1/2*ln(c*x+1))+1/2*I*b/d*arcsin(c*x)
^2-1/4*b/d*(-c^2*x^2+1)^(1/2)*c*x-1/2*b/d*arcsin(c*x)*c^2*x^2+1/4*b/d*arcsi
n(c*x)-b/d*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*I*b*polylog(2
,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d)
```

Fricas [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)x^3}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^3*arcsin(c*x) + a*x^3)/(c^2*d*x^2 - d), x)
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = -\frac{\int \frac{ax^3}{c^2x^2-1}\,dx + \int \frac{bx^3\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a*x**3/(c**2*x**2 - 1), x) + Integral(b*x**3*asin(c*x)/(c**2*x**
2 - 1), x))/d
```

Maxima [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)x^3}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(x^2/(c^2*d) + log(c^2*x^2 - 1)/(c^4*d)) - 1/2*(2*c^4*d*integrate(1/
2*(c^2*x^2*e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1)) + e^(1/2*log(c*x + 1) +
 1/2*log(-c*x + 1))*log(c*x + 1) + e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))
*log(-c*x + 1))/(c^7*d*x^4 - c^5*d*x^2 + (c^5*d*x^2 - c^3*d)*e^(log(c*x + 1
) + log(-c*x + 1))), x) + c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) + arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c^4*d)
```

Giac [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{d-c^2dx^2}\,dx=\int -\frac{(b\arcsin{(cx)}+a)x^3}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)*x^3/(c^2*d*x^2 - d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a+b\arcsin(cx))}{d-c^2dx^2}\,dx=\int \frac{x^3\,(a+b\,\mathrm{asin}(c\,x))}{d-c^2\,d\,x^2}\,dx$$

```
[In] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2),x)
[Out] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2), x)
```

3.30 $\int \frac{x^2(a+b\arcsin(cx))}{d-c^2dx^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 124

$$\int \frac{x^2(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = -\frac{b\sqrt{1-c^2x^2}}{c^3d}-\frac{x(a+b\arcsin(cx))}{c^2d}-\frac{2i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d}+\frac{ib\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^3d}-\frac{ib\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^3d}$$

```
[Out] -x*(a+b*arcsin(c*x))/c^2/d-2*I*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^
(1/2))/c^3/d+I*b*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d-I*b*polylog
(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d-b*(-c^2*x^2+1)^(1/2)/c^3/d
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4795, 4749, 4266, 2317, 2438, 267}

$$\int \frac{x^2(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = -\frac{2i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^3d}-\frac{x(a+b\arcsin(cx))}{c^2d}+\frac{ib\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^3d}-\frac{ib\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^3d}-\frac{b\sqrt{1-c^2x^2}}{c^3d}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -((b*Sqrt[1 - c^2*x^2])/(c^3*d)) - (x*(a + b*ArcSin[c*x]))/(c^2*d) - ((2*I)
*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^3*d) + (I*b*PolyLog[2, (
-I)*E^(I*ArcSin[c*x])])/(c^3*d) - (I*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^
3*d)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{x(a+b\arcsin(cx))}{c^2d} + \frac{\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx}{c^2} + \frac{b\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{cd} \\
&= -\frac{b\sqrt{1-c^2x^2}}{c^3d} - \frac{x(a+b\arcsin(cx))}{c^2d} + \frac{\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{c^3d} \\
&= -\frac{b\sqrt{1-c^2x^2}}{c^3d} - \frac{x(a+b\arcsin(cx))}{c^2d} - \frac{2i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d} \\
&\quad - \frac{b\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^3d} + \frac{b\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^3d} \\
&= -\frac{b\sqrt{1-c^2x^2}}{c^3d} - \frac{x(a+b\arcsin(cx))}{c^2d} - \frac{2i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d} \\
&\quad + \frac{(ib)\text{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{c^3d} - \frac{(ib)\text{Subst}\left(\int \frac{\log(1+ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{c^3d} \\
&= -\frac{b\sqrt{1-c^2x^2}}{c^3d} - \frac{x(a+b\arcsin(cx))}{c^2d} - \frac{2i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d} \\
&\quad + \frac{ib\,\text{PolyLog}\left(2, -ie^{i\arcsin(cx)}\right)}{c^3d} - \frac{ib\,\text{PolyLog}\left(2, ie^{i\arcsin(cx)}\right)}{c^3d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.49 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.92

$$
\int \frac{x^2(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = -\frac{2acx + 2b\sqrt{1-c^2x^2} + ib\pi\arcsin(cx) + 2bcx\arcsin(cx) - b\pi\log\left(1-ie^{i\arcsin(cx)}\right) - 2b\arcsin(cx)\log\left(1 \right.}{}
$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -1/2*(2*a*c*x + 2*b*Sqrt[1 - c^2*x^2] + I*b*Pi*ArcSin[c*x] + 2*b*c*x*ArcSin
[c*x] - b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b*ArcSin[c*x]*Log[1 - I*E^(I*
ArcSin[c*x])] - b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b*ArcSin[c*x]*Log[1 +
 I*E^(I*ArcSin[c*x])] + a*Log[1 - c*x] - a*Log[1 + c*x] + b*Pi*Log[-Cos[(Pi
 + 2*ArcSin[c*x])/4]] + b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*b*Pol
yLog[2, (-I)*E^(I*ArcSin[c*x])] + (2*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/
(c^3*d)
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 191, normalized size of antiderivative = 1.54

method	result
derivativedivides	$\frac{-\frac{a\left(cx+\frac{\ln(cx-1)}{2}-\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b\sqrt{-c^2x^2+1}}{d}-\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}+\frac{b\arcsin(cx)\ln\left(1-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}-}{c^3}$
default	$\frac{-\frac{a\left(cx+\frac{\ln(cx-1)}{2}-\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b\sqrt{-c^2x^2+1}}{d}-\frac{b\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}+\frac{b\arcsin(cx)\ln\left(1-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}-}{c^3}$
parts	$-\frac{a\left(\frac{x}{c^2}+\frac{\ln(cx-1)}{2c^3}-\frac{\ln(cx+1)}{2c^3}\right)}{d}-\frac{b\sqrt{-c^2x^2+1}}{c^3d}-\frac{b\arcsin(cx)x}{d\,c^2}+\frac{ib\,\text{dilog}\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d\,c^3}-\frac{ib\,\text{dilog}\left(1-\right.}{}$

[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)

[Out] 1/c^3*(-a/d*(c*x+1/2*ln(c*x-1)-1/2*ln(c*x+1))-b/d*(-c^2*x^2+1)^(1/2)-b/d*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+b/d*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-b/d*arcsin(c*x)*c*x-I*b/d*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*b/d*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2))))

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)x^2}{c^2dx^2-d}\,dx$$

[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")

[Out] integral(-(b*x^2*arcsin(c*x) + a*x^2)/(c^2*d*x^2 - d), x)

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = -\frac{\int \frac{ax^2}{c^2x^2-1}\,dx + \int \frac{bx^2\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)

[Out] -(Integral(a*x**2/(c**2*x**2 - 1), x) + Integral(b*x**2*asin(c*x)/(c**2*x**2 - 1), x))/d

Maxima [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)x^2}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(2*x/(c^2*d) - log(c*x + 1)/(c^3*d) + log(c*x - 1)/(c^3*d)) + 1/2*(2
*c^3*d*integrate(-1/2*(2*c*x - log(c*x + 1) + log(-c*x + 1))*sqrt(c*x + 1)*
sqrt(-c*x + 1)/(c^4*d*x^2 - c^2*d), x) - 2*c*x*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1)) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) -
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c^3*d)
```

Giac [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)x^2}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^2/(c^2*d*x^2 - d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))}{d-c^2\,d\,x^2}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2),x)
```

```
[Out] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2), x)
```

3.31 $\int \frac{x(a+b\arcsin(cx))}{d-c^2dx^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 82

$$\int \frac{x(a+b\arcsin(cx))}{d-c^2dx^2}\,dx=\frac{i(a+b\arcsin(cx))^2}{2bc^2d}-\frac{(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^2d}+\frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2c^2d}$$

```
[Out] 1/2*I*(a+b*arcsin(c*x))^2/b/c^2/d-(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1
)^(1/2))^2)/c^2/d+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^2/d
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {4765, 3800, 2221, 2317, 2438}

$$\int \frac{x(a+b\arcsin(cx))}{d-c^2dx^2}\,dx=\frac{i(a+b\arcsin(cx))^2}{2bc^2d}-\frac{\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^2d}+\frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2c^2d}$$

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] ((I/2)*(a + b*ArcSin[c*x])^2)/(b*c^2*d) - ((a + b*ArcSin[c*x])*Log[1 + E^((
2*I)*ArcSin[c*x])])/(c^2*d) + ((I/2)*b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/
(c^2*d)
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{c^2d} \\
&= \frac{i(a+b\arcsin(cx))^2}{2bc^2d} - \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{c^2d} \\
&= \frac{i(a+b\arcsin(cx))^2}{2bc^2d} - \frac{(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^2d} \\
&\quad + \frac{b\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{c^2d} \\
&= \frac{i(a+b\arcsin(cx))^2}{2bc^2d} - \frac{(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^2d} \\
&\quad - \frac{(ib)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2c^2d} \\
&= \frac{i(a+b\arcsin(cx))^2}{2bc^2d} - \frac{(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^2d} + \frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2c^2d}
\end{aligned}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 244 vs. $2(82) = 164$.

Time = 0.31 (sec) , antiderivative size = 244, normalized size of antiderivative = 2.98

$$\int \frac{x(a + b\arcsin(cx))}{d - c^2dx^2} \, dx = -\frac{2ib\pi\arcsin(cx) - ib\arcsin(cx)^2 + 4b\pi\log\left(1 + e^{-i\arcsin(cx)}\right) + b\pi\log\left(1 - ie^{i\arcsin(cx)}\right) + 2b\arcsin(cx)\,\mathrm{lo}}{}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] -1/2*((2*I)*b*Pi*ArcSin[c*x] - I*b*ArcSin[c*x]^2 + 4*b*Pi*Log[1 + E^((-I)*A
rcSin[c*x])] + b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b*ArcSin[c*x]*Log[1 -
I*E^(I*ArcSin[c*x])] - b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b*ArcSin[c*x]*
Log[1 + I*E^(I*ArcSin[c*x])] + a*Log[1 - c^2*x^2] - 4*b*Pi*Log[Cos[ArcSin[c
*x]/2]] + b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - b*Pi*Log[Sin[(Pi + 2*Arc
Sin[c*x])/4]] - (2*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (2*I)*b*PolyLo
g[2, I*E^(I*ArcSin[c*x])]])/(c^2*d)
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.16

method	result
parts	$-\frac{a\ln(c^2x^2-1)}{2d\,c^2} - \frac{b\left(-\frac{i\arcsin(cx)^2}{2} + \arcsin(cx)\ln\left(1+\left(icx+\sqrt{-c^2x^2+1}\right)^2\right) - \frac{i\,\mathrm{polylog}\left(2,-\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{2}\right)}{d\,c^2}$
derivativedivides	$\frac{-\frac{a\left(\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d} - \frac{b\left(-\frac{i\arcsin(cx)^2}{2} + \arcsin(cx)\ln\left(1+\left(icx+\sqrt{-c^2x^2+1}\right)^2\right) - \frac{i\,\mathrm{polylog}\left(2,-\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{2}\right)}{d}}{c^2}$
default	$\frac{-\frac{a\left(\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d} - \frac{b\left(-\frac{i\arcsin(cx)^2}{2} + \arcsin(cx)\ln\left(1+\left(icx+\sqrt{-c^2x^2+1}\right)^2\right) - \frac{i\,\mathrm{polylog}\left(2,-\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{2}\right)}{d}}{c^2}$

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/d/c^2*ln(c^2*x^2-1)-b/d/c^2*(-1/2*I*arcsin(c*x)^2+arcsin(c*x)*ln(1+(
I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)
)
```

Fricas [F]

$$\int \frac{x(a+b\arcsin(cx))}{d-c^2dx^2}\,dx=\int -\frac{(b\arcsin(cx)+a)x}{c^2dx^2-d}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
[Out] integral(-(b*x*arcsin(c*x) + a*x)/(c^2*d*x^2 - d), x)
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))}{d-c^2dx^2}\,dx=-\frac{\int \frac{ax}{c^2x^2-1}\,dx+\int \frac{bx\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)
[Out] -(Integral(a*x/(c**2*x**2 - 1), x) + Integral(b*x*asin(c*x)/(c**2*x**2 - 1)
, x))/d
```

Maxima [F]

$$\int \frac{x(a+b\arcsin(cx))}{d-c^2dx^2}\,dx=\int -\frac{(b\arcsin(cx)+a)x}{c^2dx^2-d}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
[Out] -1/2*(2*c^2*d*integrate(1/2*(e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))*log(c
*x + 1) + e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))*log(-c*x + 1))/(c^5*d*x^
4 - c^3*d*x^2 + (c^3*d*x^2 - c*d)*e^(log(c*x + 1) + log(-c*x + 1))), x) + a
rctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) + arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c^2*d) - 1/2*a*log(c^2*d*x^2 - d
)/(c^2*d)
```

Giac [F]

$$\int \frac{x(a+b\arcsin(cx))}{d-c^2dx^2}\,dx=\int -\frac{(b\arcsin(cx)+a)x}{c^2dx^2-d}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)*x/(c^2*d*x^2 - d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))}{d-c^2dx^2}\,dx=\int \frac{x\,(a+b\,\mathrm{asin}(c\,x))}{d-c^2\,d\,x^2}\,dx$$

```
[In] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2),x)
[Out] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2), x)
```

3.32 $\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 84

$$\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx = -\frac{2i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{cd} + \frac{ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{cd} - \frac{ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{cd}$$

```
[Out] -2*I*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/d+I*b*polylog(2,-
I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d-I*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)
))/c/d
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4749, 4266, 2317, 2438}

$$\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx = -\frac{2i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{cd} + \frac{ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{cd} - \frac{ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{cd}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2),x]
```

```
[Out] ((-2*I)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*d) + (I*b*PolyLog
[2, (-I)*E^(I*ArcSin[c*x])])/(c*d) - (I*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/
(c*d)
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{cd}\\
&= -\frac{2i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{cd}\\
&\quad -\frac{b\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{cd}\\
&\quad +\frac{b\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{cd}\\
&= -\frac{2i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{cd}+\frac{(ib)\text{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{cd}\\
&\quad -\frac{(ib)\text{Subst}\left(\int \frac{\log(1+ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{cd}\\
&= -\frac{2i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{cd}\\
&\quad +\frac{ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{cd}-\frac{ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{cd}
\end{aligned}
$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 207 vs. 2(84) = 168.

Time = 0.27 (sec) , antiderivative size = 207, normalized size of antiderivative = 2.46

$$\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx$$
$$=\frac{-ib\pi\arcsin(cx)+b\pi\log\left(1-ie^{i\arcsin(cx)}\right)+2b\arcsin(cx)\log\left(1-ie^{i\arcsin(cx)}\right)+b\pi\log\left(1+ie^{i\arcsin(cx)}\right)-$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2),x]
```

```
[Out] ((-I)*b*Pi*ArcSin[c*x] + b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b*ArcSin[c*x
]*Log[1 - I*E^(I*ArcSin[c*x])] + b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] - 2*b*Ar
cSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - a*Log[1 - c*x] + a*Log[1 + c*x] -
b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/
4]] + (2*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (2*I)*b*PolyLog[2, I*E^(
I*ArcSin[c*x])])/(2*c*d)
```

Maple [A] (verified)

Time = 0.27 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.67

method	result
derivativedivides	$\frac{\frac{a\ \mathrm{arctanh}(cx)}{d}-\frac{b\left(-\mathrm{arctanh}(cx)\arcsin(cx)+i\,\mathrm{arctanh}(cx)\left(\ln\left(1-\frac{i(cx+1)}{\sqrt{-c^2x^2+1}}\right)-\ln\left(1+\frac{i(cx+1)}{\sqrt{-c^2x^2+1}}\right)\right)-i\,\mathrm{dilog}\left(1+\frac{i(cx+1)}{\sqrt{-c^2x^2+1}}\right)+i\,\mathrm{di}}{d}}{c}$
default	$\frac{\frac{a\ \mathrm{arctanh}(cx)}{d}-\frac{b\left(-\mathrm{arctanh}(cx)\arcsin(cx)+i\,\mathrm{arctanh}(cx)\left(\ln\left(1-\frac{i(cx+1)}{\sqrt{-c^2x^2+1}}\right)-\ln\left(1+\frac{i(cx+1)}{\sqrt{-c^2x^2+1}}\right)\right)-i\,\mathrm{dilog}\left(1+\frac{i(cx+1)}{\sqrt{-c^2x^2+1}}\right)+i\,\mathrm{di}}{d}}{c}$
parts	$-\frac{a\ln(cx-1)}{2dc}+\frac{a\ln(cx+1)}{2dc}-\frac{b\left(-\mathrm{arctanh}(cx)\arcsin(cx)+i\,\mathrm{arctanh}(cx)\left(\ln\left(1-\frac{i(cx+1)}{\sqrt{-c^2x^2+1}}\right)-\ln\left(1+\frac{i(cx+1)}{\sqrt{-c^2x^2+1}}\right)\right)}{dc}$

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a/d*arctanh(c*x)-b/d*(-arctanh(c*x)*arcsin(c*x)+I*arctanh(c*x)*(ln(1-I
*(c*x+1)/(-c^2*x^2+1)^(1/2))-ln(1+I*(c*x+1)/(-c^2*x^2+1)^(1/2)))-I*dilog(1+
I*(c*x+1)/(-c^2*x^2+1)^(1/2))+I*dilog(1-I*(c*x+1)/(-c^2*x^2+1)^(1/2))))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx = \int -\frac{b\arcsin(cx)+a}{c^2dx^2-d}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^2 - d), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx = -\frac{\int \frac{a}{c^2x^2-1}\,dx + \int \frac{b\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d),x)
[Out] -(Integral(a/(c**2*x**2 - 1), x) + Integral(b*asin(c*x)/(c**2*x**2 - 1), x)
)/d
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx = \int -\frac{b\arcsin(cx)+a}{c^2dx^2-d}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
[Out] 1/2*a*(log(c*x + 1)/(c*d) - log(c*x - 1)/(c*d)) + 1/2*(2*c*d*integrate(1/2*
sqrt(c*x + 1)*sqrt(-c*x + 1)*(log(c*x + 1) - log(-c*x + 1))/(c^2*d*x^2 - d)
, x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*b/(c*d)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx = \int -\frac{b\arcsin(cx)+a}{c^2dx^2-d}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)/(c^2*d*x^2 - d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{d-c^2\,d\,x^2}\,dx$$

```
[In] int((a + b*asin(c*x))/(d - c^2*d*x^2),x)
[Out] int((a + b*asin(c*x))/(d - c^2*d*x^2), x)
```

3.33 $\int \frac{a+b\arcsin(cx)}{x(d-c^2dx^2)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 71

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)}\,dx=-\frac{2(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d}+\frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2d}-\frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d}$$

```
[Out] -2*(a+b*arcsin(c*x))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/d+1/2*I*b*polylo
g(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^
(1/2))^2)/d
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4769, 4504, 4268, 2317, 2438}

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)}\,dx=-\frac{2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d}+\frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2d}-\frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)),x]
```

```
[Out] (-2*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d + ((I/2)*b*PolyLo
g[2, -E^((2*I)*ArcSin[c*x])])/d - ((I/2)*b*PolyLog[2, E^((2*I)*ArcSin[c*x])
])/d
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}(\int (a+bx)\csc(x)\sec(x)\,dx, x, \arcsin(cx))}{d}\\
&= \frac{2\text{Subst}(\int (a+bx)\csc(2x)\,dx, x, \arcsin(cx))}{d}\\
&= -\frac{2(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d}\\
&\quad -\frac{b\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d}\\
&\quad +\frac{b\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d}
\end{aligned}$$

$$= -\frac{2(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d} + \frac{(ib)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2d} - \frac{(ib)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2d}$$

$$= -\frac{2(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d} + \frac{ib\,\text{PolyLog}\left(2, -e^{2i\arcsin(cx)}\right)}{2d} - \frac{ib\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)}{2d}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 274 vs. 2(71) = 142.

Time = 0.18 (sec) , antiderivative size = 274, normalized size of antiderivative = 3.86

$$\int \frac{a+b\arcsin(cx)}{x(d-c^2dx^2)}\,dx = -\frac{2ib\pi\arcsin(cx) + 4b\pi\log\left(1+e^{-i\arcsin(cx)}\right) + b\pi\log\left(1-ie^{i\arcsin(cx)}\right) + 2b\arcsin(cx)\log\left(1-ie^{i\arcsin(cx}\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)),x]
```

```
[Out] -1/2*((2*I)*b*Pi*ArcSin[c*x] + 4*b*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + b*Pi*
Log[1 - I*E^(I*ArcSin[c*x])] + 2*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])]
 - b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSi
n[c*x])] - 2*b*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - 2*a*Log[x] + a*
Log[1 - c^2*x^2] - 4*b*Pi*Log[Cos[ArcSin[c*x]/2]] + b*Pi*Log[-Cos[(Pi + 2*A
rcSin[c*x])/4]] - b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*b*PolyLog[2
, (-I)*E^(I*ArcSin[c*x])] - (2*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])] + I*b*P
olyLog[2, E^((2*I)*ArcSin[c*x])])/d
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 192 vs. 2(95) = 190.

Time = 0.13 (sec) , antiderivative size = 193, normalized size of antiderivative = 2.72

method	result
parts	$-\frac{a\left(-\ln(x)+\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b\left(-\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+i\,\mathrm{polylog}\left(2,-icx-\sqrt{-c^2x^2+1}\right)+\arcsin\right.}{}$
derivativedivides	$-\frac{a\left(-\ln(cx)+\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b\left(-\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+i\,\mathrm{polylog}\left(2,-icx-\sqrt{-c^2x^2+1}\right)+\arcsi\right.}{}$
default	$-\frac{a\left(-\ln(cx)+\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b\left(-\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+i\,\mathrm{polylog}\left(2,-icx-\sqrt{-c^2x^2+1}\right)+\arcsi\right.}{}$

```
[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
[Out] -a/d*(-ln(x)+1/2*ln(c*x-1)+1/2*ln(c*x+1))-b/d*(-arcsin(c*x)*ln(1+I*c*x+(-c^
2*x^2+1)^(1/2))+I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+arcsin(c*x)*ln(1+(I*
c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-a
rcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+I*polylog(2,I*c*x+(-c^2*x^2+1)^(1
/2)))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x\,(d-c^2dx^2)}\,dx=\int -\frac{b\arcsin\left(cx\right)+a}{(c^2dx^2-d)x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d),x, algorithm="fricas")
[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^3 - d*x), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x\,(d-c^2dx^2)}\,dx=-\frac{\int \frac{a}{c^2x^3-x}\,dx+\int \frac{b\,\mathrm{asin}\left(cx\right)}{c^2x^3-x}\,dx}{d}$$

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d),x)
[Out] -(Integral(a/(c**2*x**3 - x), x) + Integral(b*asin(c*x)/(c**2*x**3 - x), x)
)/d
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x\,(d-c^2dx^2)}\,dx=\int -\frac{b\arcsin\left(cx\right)+a}{(c^2dx^2-d)x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(log(c*x + 1)/d + log(c*x - 1)/d - 2*log(x)/d) - b*integrate(arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d*x^3 - d*x), x)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x\,(d-c^2dx^2)}\,dx=\int -\frac{b\arcsin\left(cx\right)+a}{(c^2dx^2-d)x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x\,(d-c^2dx^2)}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{x\,\left(d-c^2\,d\,x^2\right)}\,dx$$

```
[In] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)), x)
```

3.34 $\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 116

$$\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)}\,dx = -\frac{a+b\arcsin(cx)}{dx} - \frac{2ic(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d} - \frac{b c \operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d} + \frac{ibc\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d} - \frac{ibc\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d}$$

```
[Out] (-a-b*arcsin(c*x))/d/x-2*I*c*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1
/2))/d-b*c*arctanh((-c^2*x^2+1)^(1/2))/d+I*b*c*polylog(2,-I*(I*c*x+(-c^2*x^
2+1)^(1/2)))/d-I*b*c*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {4789, 4749, 4266, 2317, 2438, 272, 65, 214}

$$\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)}\,dx = -\frac{2ic\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d} - \frac{a+b\arcsin(cx)}{dx} + \frac{ibc\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d} - \frac{ibc\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d} - \frac{b c \operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])/(d*x)) - ((2*I)*c*(a + b*ArcSin[c*x])*ArcTan[E^(I*Arc
Sin[c*x])])/d - (b*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d + (I*b*c*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])])/d - (I*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx)}{dx}+c^2\int\frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx+\frac{(bc)\int\frac{1}{x\sqrt{1-c^2x^2}}\,dx}{d}\\
&= -\frac{a+b\arcsin(cx)}{dx}+\frac{c\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{d}\\
&\quad+\frac{(bc)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2d}\\
&= -\frac{a+b\arcsin(cx)}{dx}-\frac{2ic(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d}\\
&\quad-\frac{b\text{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{cd}\\
&\quad-\frac{(bc)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d}\\
&\quad+\frac{(bc)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d}\\
&= -\frac{a+b\arcsin(cx)}{dx}-\frac{2ic(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d}-\frac{bc\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d}\\
&\quad+\frac{(ibc)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d}-\frac{(ibc)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d}\\
&= -\frac{a+b\arcsin(cx)}{dx}-\frac{2ic(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d}\\
&\quad-\frac{bc\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d}+\frac{ibc\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d}\\
&\quad-\frac{ibc\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d}
\end{aligned}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 259 vs. $2(116) = 232$.

Time = 0.71 (sec) , antiderivative size = 259, normalized size of antiderivative = 2.23

$$\int \frac{a + b \arcsin(cx)}{x^2 (d - c^2 dx^2)} \, dx = -\frac{2a + 2b \arcsin(cx) + ibc\pi x \arcsin(cx) + 2bcx \operatorname{arctanh}\left(\sqrt{1 - c^2x^2}\right) - bc\pi x \log\left(1 - ie^{i \arcsin(cx)}\right) - 2bcx \operatorname{a}}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)),x]
```

```
[Out] -1/2*(2*a + 2*b*ArcSin[c*x] + I*b*c*Pi*x*ArcSin[c*x] + 2*b*c*x*ArcTanh[Sqrt
[1 - c^2*x^2]] - b*c*Pi*x*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b*c*x*ArcSin[c*x
]*Log[1 - I*E^(I*ArcSin[c*x])] - b*c*Pi*x*Log[1 + I*E^(I*ArcSin[c*x])] + 2*
b*c*x*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + a*c*x*Log[1 - c*x] - a*c*x
*Log[1 + c*x] + b*c*Pi*x*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + b*c*Pi*x*Log[S
in[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*b*c*x*PolyLog[2, (-I)*E^(I*ArcSin[c*x])
] + (2*I)*b*c*x*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*x)
```

Maple [A] (verified)

Time = 0.23 (sec) , antiderivative size = 204, normalized size of antiderivative = 1.76

method	result
parts	$-\frac{a\left(\frac{c\ln(cx-1)}{2}-\frac{c\ln(cx+1)}{2}+\frac{1}{x}\right)}{d}-\frac{bc\left(\frac{\arcsin(cx)}{cx}+\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)-\arcsin(cx)\ln\left(1-i\left(icx+\sqrt{-}\right.\right.\right.}{}$
derivativedivides	$c\left(-\frac{a\left(\frac{1}{cx}+\frac{\ln(cx-1)}{2}-\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b\left(\frac{\arcsin(cx)}{cx}+\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)-\arcsin(cx)\ln\left(1-i\left(icx+\sqrt{}\right.\right.\right.}{}\right.$
default	$c\left(-\frac{a\left(\frac{1}{cx}+\frac{\ln(cx-1)}{2}-\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b\left(\frac{\arcsin(cx)}{cx}+\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)-\arcsin(cx)\ln\left(1-i\left(icx+\sqrt{}\right.\right.\right.}{}\right.$

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] -a/d*(1/2*c*ln(c*x-1)-1/2*c*ln(c*x+1)+1/x)-b/d*c*(1/c/x*arcsin(c*x)+arcsin(
c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2
+1)^(1/2)))-ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)+ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I
*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2
))))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)}\,dx = \int -\frac{b\arcsin(cx)+a}{(c^2dx^2-d)x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d),x, algorithm="fricas")
[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^4 - d*x^2), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)}\,dx = -\frac{\int \frac{a}{c^2x^4-x^2}\,dx + \int \frac{b\operatorname{asin}(cx)}{c^2x^4-x^2}\,dx}{d}$$

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d),x)
[Out] -(Integral(a/(c**2*x**4 - x**2), x) + Integral(b*asin(c*x)/(c**2*x**4 - x**
2), x))/d
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)}\,dx = \int -\frac{b\arcsin(cx)+a}{(c^2dx^2-d)x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d),x, algorithm="maxima")
[Out] 1/2*a*(c*log(c*x + 1)/d - c*log(c*x - 1)/d - 2/(d*x)) + 1/2*(c*x*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - c*x*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 2*d*x*integrate(1/2*(c^2*x*log(c*x + 1)
 - c^2*x*log(-c*x + 1) - 2*c)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*d*x^3 - d*x
), x) - 2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(d*x)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)}\,dx = \int -\frac{b\arcsin(cx)+a}{(c^2dx^2-d)x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)*x^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^2\,\left(d-c^2\,d\,x^2\right)}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)),x)
[Out] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)), x)
```

3.35 $\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 124

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)}\,dx = -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\arcsin(cx)}{2dx^2} - \frac{2c^2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d} + \frac{ibc^2\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2d} - \frac{ibc^2\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d}$$

```
[Out] 1/2*(-a-b*arcsin(c*x))/d/x^2-2*c^2*(a+b*arcsin(c*x))*arctanh((I*c*x+(-c^2*x
^2+1)^(1/2))^2)/d+1/2*I*b*c^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-1/
2*I*b*c^2*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-1/2*b*c*(-c^2*x^2+1)^(1
/2)/d/x
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {4789, 4769, 4504, 4268, 2317, 2438, 270}

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)}\,dx = -\frac{2c^2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d} - \frac{a+b\arcsin(cx)}{2dx^2} + \frac{ibc^2\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2d} - \frac{ibc^2\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d} - \frac{bc\sqrt{1-c^2x^2}}{2dx}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)),x]
```

```
[Out] -1/2*(b*c*Sqrt[1 - c^2*x^2])/(d*x) - (a + b*ArcSin[c*x])/(2*d*x^2) - (2*c^2
*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d + ((I/2)*b*c^2*PolyL
og[2, -E^((2*I)*ArcSin[c*x])])/d - ((I/2)*b*c^2*PolyLog[2, E^((2*I)*ArcSin[
c*x])])/d
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
```

```
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx)}{2dx^2}+c^2\int\frac{a+b\arcsin(cx)}{x(d-c^2dx^2)}\,dx+\frac{(bc)\int\frac{1}{x^2\sqrt{1-c^2x^2}}\,dx}{2d}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\arcsin(cx)}{2dx^2}+\frac{c^2\text{Subst}\left(\int(a+bx)\csc(x)\sec(x)\,dx,x,\arcsin(cx)\right)}{d}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\arcsin(cx)}{2dx^2}+\frac{(2c^2)\,\text{Subst}\left(\int(a+bx)\csc(2x)\,dx,x,\arcsin(cx)\right)}{d}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\arcsin(cx)}{2dx^2}-\frac{2c^2(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d}\\
&\quad-\frac{(bc^2)\,\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d}\\
&\quad+\frac{(bc^2)\,\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\arcsin(cx)}{2dx^2}-\frac{2c^2(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d}\\
&\quad+\frac{(ibc^2)\,\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{2d}-\frac{(ibc^2)\,\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{2d}\\
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\arcsin(cx)}{2dx^2}-\frac{2c^2(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d}\\
&\quad+\frac{ibc^2\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2d}-\frac{ibc^2\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d}
\end{aligned}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 392 vs. 2(124) = 248.

Time = 0.23 (sec) , antiderivative size = 392, normalized size of antiderivative = 3.16

$$\int\frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)}\,dx=$$
$$-\frac{a+bcx\sqrt{1-c^2x^2}+b\arcsin(cx)+2ibc^2\pi x^2\arcsin(cx)+4bc^2\pi x^2\log\left(1+e^{-i\arcsin(cx)}\right)+bc^2\pi x^2\log\left(1-\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)),x]
```

```
[Out] -1/2*(a + b*c*x*Sqrt[1 - c^2*x^2] + b*ArcSin[c*x] + (2*I)*b*c^2*Pi*x^2*ArcS
in[c*x] + 4*b*c^2*Pi*x^2*Log[1 + E^((-I)*ArcSin[c*x])] + b*c^2*Pi*x^2*Log[1
 - I*E^(I*ArcSin[c*x])] + 2*b*c^2*x^2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x
])] - b*c^2*Pi*x^2*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b*c^2*x^2*ArcSin[c*x]*L
og[1 + I*E^(I*ArcSin[c*x])] - 2*b*c^2*x^2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcS
in[c*x])] - 2*a*c^2*x^2*Log[x] + a*c^2*x^2*Log[1 - c^2*x^2] - 4*b*c^2*Pi*x^
2*Log[Cos[ArcSin[c*x]/2]] + b*c^2*Pi*x^2*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]
- b*c^2*Pi*x^2*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*b*c^2*x^2*PolyLog[2
, (-I)*E^(I*ArcSin[c*x])] - (2*I)*b*c^2*x^2*PolyLog[2, I*E^(I*ArcSin[c*x])]
 + I*b*c^2*x^2*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(d*x^2)
```

Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 244, normalized size of antiderivative = 1.97

method	result
derivativedivides	$c^2\left(-\frac{a\left(\frac{1}{2c^2x^2}-\ln(cx)+\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b\left(\frac{-ic^2x^2+cx\sqrt{-c^2x^2+1}+\arcsin(cx)}{2c^2x^2}-\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2}\right.\right.}{}\right.$
default	$c^2\left(-\frac{a\left(\frac{1}{2c^2x^2}-\ln(cx)+\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b\left(\frac{-ic^2x^2+cx\sqrt{-c^2x^2+1}+\arcsin(cx)}{2c^2x^2}-\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2}\right.\right.}{}\right.$
parts	$-\frac{a\left(\frac{1}{2x^2}-c^2\ln(x)+\frac{c^2\ln(cx-1)}{2}+\frac{c^2\ln(cx+1)}{2}\right)}{d}-\frac{bc^2\left(\frac{-ic^2x^2+cx\sqrt{-c^2x^2+1}+\arcsin(cx)}{2c^2x^2}-\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2}\right.\right.}{}$

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(-a/d*(1/2/c^2/x^2-ln(c*x)+1/2*ln(c*x-1)+1/2*ln(c*x+1))-b/d*(1/2*(-I*c^
2*x^2+c*x*(-c^2*x^2+1)^(1/2)+arcsin(c*x))/c^2/x^2-arcsin(c*x)*ln(1+I*c*x+(-
c^2*x^2+1)^(1/2))+I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+arcsin(c*x)*ln(1+(
I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)
-arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+I*polylog(2,I*c*x+(-c^2*x^2+1)^
(1/2))))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)}\,dx = \int -\frac{b\arcsin(cx)+a}{(c^2dx^2-d)x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d),x, algorithm="fricas")
[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^5 - d*x^3), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)}\,dx = -\frac{\int \frac{a}{c^2x^5-x^3}\,dx + \int \frac{b\,\mathrm{asin}(cx)}{c^2x^5-x^3}\,dx}{d}$$

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d),x)
[Out] -(Integral(a/(c**2*x**5 - x**3), x) + Integral(b*asin(c*x)/(c**2*x**5 - x**
3), x))/d
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)}\,dx = \int -\frac{b\arcsin(cx)+a}{(c^2dx^2-d)x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d),x, algorithm="maxima")
[Out] -1/2*(c^2*log(c*x + 1)/d + c^2*log(c*x - 1)/d - 2*c^2*log(x)/d + 1/(d*x^2))
*a - b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d*x^5 - d*
x^3), x)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)}\,dx = \int -\frac{b\arcsin(cx)+a}{(c^2dx^2-d)x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)*x^3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^3\,\left(d-c^2\,d\,x^2\right)}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)),x)
[Out] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)), x)
```

3.36 $\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 173

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)}\,dx = -\frac{bc\sqrt{1-c^2x^2}}{6dx^2}-\frac{a+b\arcsin(cx)}{3dx^3}-\frac{c^2(a+b\arcsin(cx))}{dx} -\frac{2ic^3(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d} -\frac{7bc^3\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d}+\frac{ibc^3\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d} -\frac{ibc^3\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d}$$

```
[Out] 1/3*(-a-b*arcsin(c*x))/d/x^3-c^2*(a+b*arcsin(c*x))/d/x-2*I*c^3*(a+b*arcsin(
c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d-7/6*b*c^3*arctanh((-c^2*x^2+1)^(1/
2))/d+I*b*c^3*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d-I*b*c^3*polylog(2,
I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d-1/6*b*c*(-c^2*x^2+1)^(1/2)/d/x^2
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used

$= \{4789, 4749, 4266, 2317, 2438, 272, 65, 214, 44\}$

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)}\,dx = -\frac{2ic^3\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d} - \frac{c^2(a+b\arcsin(cx))}{dx} - \frac{a+b\arcsin(cx)}{3dx^3} + \frac{ibc^3\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d} - \frac{ibc^3\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d} - \frac{7bc^3\mathrm{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d} - \frac{bc\sqrt{1-c^2x^2}}{6dx^2}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)),x]
```

```
[Out] -1/6*(b*c*Sqrt[1 - c^2*x^2])/(d*x^2) - (a + b*ArcSin[c*x])/(3*d*x^3) - (c^2
*(a + b*ArcSin[c*x]))/(d*x) - ((2*I)*c^3*(a + b*ArcSin[c*x])*ArcTan[E^(I*Ar
cSin[c*x])])/d - (7*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*d) + (I*b*c^3*Poly
Log[2, (-I)*E^(I*ArcSin[c*x])])/d - (I*b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])
])/d
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx)}{3dx^3}+c^2\int\frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)}\,dx+\frac{(bc)\int\frac{1}{x^3\sqrt{1-c^2x^2}}\,dx}{3d}\\
&= -\frac{a+b\arcsin(cx)}{3dx^3}-\frac{c^2(a+b\arcsin(cx))}{dx}+c^4\int\frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx\\
&\quad+\frac{(bc)\text{Subst}\left(\int\frac{1}{x^2\sqrt{1-c^2x}}\,dx,x,x^2\right)}{6d}+\frac{(bc^3)\int\frac{1}{x\sqrt{1-c^2x^2}}\,dx}{d}
\end{aligned}
$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\arcsin(cx)}{3dx^3} - \frac{c^2(a+b\arcsin(cx))}{dx} + \frac{c^3\text{Subst}(\int(a+bx)\sec(x)\,dx, x, \arcsin(cx))}{d} + \frac{(bc^3)\,\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx, x, x^2\right)}{12d} + \frac{(bc^3)\,\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx, x, x^2\right)}{2d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\arcsin(cx)}{3dx^3} - \frac{c^2(a+b\arcsin(cx))}{dx} - \frac{2ic^3(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d} - \frac{(bc)\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{6d} - \frac{(bc)\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{d} - \frac{(bc^3)\,\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{d} + \frac{(bc^3)\,\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\arcsin(cx)}{3dx^3} - \frac{c^2(a+b\arcsin(cx))}{dx} - \frac{2ic^3(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d} - \frac{7bc^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d} + \frac{(ibc^3)\,\text{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{d} - \frac{(ibc^3)\,\text{Subst}\left(\int \frac{\log(1+ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\arcsin(cx)}{3dx^3} - \frac{c^2(a+b\arcsin(cx))}{dx} - \frac{2ic^3(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d} - \frac{7bc^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d} + \frac{ibc^3\,\text{PolyLog}\left(2, -ie^{i\arcsin(cx)}\right)}{d} - \frac{ibc^3\,\text{PolyLog}\left(2, ie^{i\arcsin(cx)}\right)}{d}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 350 vs. 2(173) = 346.

Time = 0.48 (sec) , antiderivative size = 350, normalized size of antiderivative = 2.02

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)}\,dx = -\frac{2a+6ac^2x^2+bcx\sqrt{1-c^2x^2}+2b\arcsin(cx)+6bc^2x^2\arcsin(cx)+3ibc^3\pi x^3\arcsin(cx)+7bc^3x^3\text{arctanh}}{}$$

[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)),x]

[Out] -1/6*(2*a + 6*a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2] + 2*b*ArcSin[c*x] + 6*b*c^2*x^2*ArcSin[c*x] + (3*I)*b*c^3*Pi*x^3*ArcSin[c*x] + 7*b*c^3*x^3*ArcTanh[Sqrt[1 - c^2*x^2]] - 3*b*c^3*Pi*x^3*Log[1 - I*E^(I*ArcSin[c*x])] - 6*b*c^3*x^3*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 3*b*c^3*Pi*x^3*Log[1 + I*E^(I*ArcSin[c*x])] + 6*b*c^3*x^3*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 3*a*c^3*x^3*Log[1 - c*x] - 3*a*c^3*x^3*Log[1 + c*x] + 3*b*c^3*Pi*x^3*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 3*b*c^3*Pi*x^3*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (6*I)*b*c^3*x^3*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (6*I)*b*c^3*x^3*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*x^3)

Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.45

method	result
derivativedivides	$c^3\left(-\frac{a\left(\frac{1}{3c^3x^3}+\frac{1}{cx}+\frac{\ln(cx-1)}{2}-\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b\left(\frac{6c^2x^2\arcsin(cx)+cx\sqrt{-c^2x^2+1}+2\arcsin(cx)}{6c^3x^3}-\frac{7\ln\left(icx+\sqrt{-c^2x^2+1}-1\right)}{6}+\right.}{}\right.$
default	$c^3\left(-\frac{a\left(\frac{1}{3c^3x^3}+\frac{1}{cx}+\frac{\ln(cx-1)}{2}-\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b\left(\frac{6c^2x^2\arcsin(cx)+cx\sqrt{-c^2x^2+1}+2\arcsin(cx)}{6c^3x^3}-\frac{7\ln\left(icx+\sqrt{-c^2x^2+1}-1\right)}{6}+\right.}{}\right.$
parts	$-\frac{a\left(\frac{1}{3x^3}+\frac{c^2}{x}+\frac{c^3\ln(cx-1)}{2}-\frac{c^3\ln(cx+1)}{2}\right)}{d}-\frac{bc^3\left(\frac{6c^2x^2\arcsin(cx)+cx\sqrt{-c^2x^2+1}+2\arcsin(cx)}{6c^3x^3}-\frac{7\ln\left(icx+\sqrt{-c^2x^2+1}-1\right)}{6}+\right.}{}$

[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)

[Out] c^3*(-a/d*(1/3/c^3/x^3+1/c/x+1/2*ln(c*x-1)-1/2*ln(c*x+1))-b/d*(1/6*(6*c^2*x^2*arcsin(c*x)+c*x*(-c^2*x^2+1)^(1/2)+2*arcsin(c*x))/c^3/x^3-7/6*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)+7/6*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+arcsin(c*x)*ln(1+I*

(I*c*x+(-c^2*x^2+1)^(1/2)))-arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)}\,dx = \int -\frac{b\arcsin(cx)+a}{(c^2dx^2-d)x^4}\,dx$$

[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d),x, algorithm="fricas")

[Out] integral(-(b*arcsin(c*x) + a)/(c^2*d*x^6 - d*x^4), x)

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)}\,dx = -\frac{\int \frac{a}{c^2x^6-x^4}\,dx + \int \frac{b\,\mathrm{asin}\,(cx)}{c^2x^6-x^4}\,dx}{d}$$

[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d),x)

[Out] -(Integral(a/(c**2*x**6 - x**4), x) + Integral(b*asin(c*x)/(c**2*x**6 - x**4), x))/d

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)}\,dx = \int -\frac{b\arcsin(cx)+a}{(c^2dx^2-d)x^4}\,dx$$

[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d),x, algorithm="maxima")

[Out] 1/6*(3*c^3*log(c*x + 1)/d - 3*c^3*log(c*x - 1)/d - 2*(3*c^2*x^2 + 1)/(d*x^3))*a + 1/6*(3*c^3*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 3*c^3*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 6*d*x^3*integrate(1/6*(3*c^4*x^3*log(c*x + 1) - 3*c^4*x^3*log(-c*x + 1) - 6*c^3*x^2 - 2*c)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*d*x^5 - d*x^3), x) - 2*(3*c^2*x^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(d*x^3)

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)}\,dx = \int -\frac{b\arcsin(cx)+a}{(c^2dx^2-d)x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)*x^4), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{x^4\,(d-c^2\,d\,x^2)}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)),x)
[Out] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)), x)
```

3.37 $\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 187

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = -\frac{b}{2c^5d^2\sqrt{1-c^2x^2}}+\frac{b\sqrt{1-c^2x^2}}{c^5d^2}+\frac{3x(a+b\arcsin(cx))}{2c^4d^2}+\frac{x^3(a+b\arcsin(cx))}{2c^2d^2(1-c^2x^2)}+\frac{3i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d^2}-\frac{3ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{2c^5d^2}+\frac{3ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{2c^5d^2}$$

```
[Out] 3/2*x*(a+b*arcsin(c*x))/c^4/d^2+1/2*x^3*(a+b*arcsin(c*x))/c^2/d^2/(-c^2*x^2
+1)+3*I*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c^5/d^2-3/2*I*b*
polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^2+3/2*I*b*polylog(2,I*(I*c*x
+(-c^2*x^2+1)^(1/2)))/c^5/d^2-1/2*b/c^5/d^2/(-c^2*x^2+1)^(1/2)+b*(-c^2*x^2+
1)^(1/2)/c^5/d^2
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 187, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used

= {4791, 4795, 4749, 4266, 2317, 2438, 267, 272, 45}

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \frac{3i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^5d^2} + \frac{3x(a+b\arcsin(cx))}{2c^4d^2} + \frac{x^3(a+b\arcsin(cx))}{2c^2d^2(1-c^2x^2)} - \frac{3ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{2c^5d^2} + \frac{3ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{2c^5d^2} + \frac{b\sqrt{1-c^2x^2}}{c^5d^2} - \frac{b}{2c^5d^2\sqrt{1-c^2x^2}}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/2*b/(c^5*d^2*Sqrt[1 - c^2*x^2]) + (b*Sqrt[1 - c^2*x^2])/(c^5*d^2) + (3*x
*(a + b*ArcSin[c*x]))/(2*c^4*d^2) + (x^3*(a + b*ArcSin[c*x]))/(2*c^2*d^2*(1
 - c^2*x^2)) + ((3*I)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^5*d
^2) - (((3*I)/2)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^5*d^2) + (((3*I)/
2)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5*d^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^3(a+b\arcsin(cx))}{2c^2d^2(1-c^2x^2)} - \frac{b\int \frac{x^3}{(1-c^2x^2)^{3/2}}\,dx}{2cd^2} - \frac{3\int \frac{x^2(a+b\arcsin(cx))}{d-c^2dx^2}\,dx}{2c^2d} \\
&= \frac{3x(a+b\arcsin(cx))}{2c^4d^2} + \frac{x^3(a+b\arcsin(cx))}{2c^2d^2(1-c^2x^2)} - \frac{(3b)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{2c^3d^2} \\
&\quad - \frac{b\text{Subst}\left(\int \frac{x}{(1-c^2x)^{3/2}}\,dx, x, x^2\right)}{4cd^2} - \frac{3\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx}{2c^4d}
\end{aligned}$$

$$= \frac{3b\sqrt{1-c^2x^2}}{2c^5d^2} + \frac{3x(a+b\arcsin(cx))}{2c^4d^2} + \frac{x^3(a+b\arcsin(cx))}{2c^2d^2\,(1-c^2x^2)} - \frac{3\text{Subst}(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx))}{2c^5d^2} - \frac{b\text{Subst}\left(\int \left(\frac{1}{c^2(1-c^2x)^{3/2}} - \frac{1}{c^2\sqrt{1-c^2x}}\right)\,dx, x, x^2\right)}{4cd^2}$$

$$= -\frac{b}{2c^5d^2\sqrt{1-c^2x^2}} + \frac{b\sqrt{1-c^2x^2}}{c^5d^2} + \frac{3x(a+b\arcsin(cx))}{2c^4d^2} + \frac{x^3(a+b\arcsin(cx))}{2c^2d^2\,(1-c^2x^2)} + \frac{3i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d^2} + \frac{(3b)\text{Subst}(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx))}{2c^5d^2} - \frac{(3b)\text{Subst}(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx))}{2c^5d^2}$$

$$= -\frac{b}{2c^5d^2\sqrt{1-c^2x^2}} + \frac{b\sqrt{1-c^2x^2}}{c^5d^2} + \frac{3x(a+b\arcsin(cx))}{2c^4d^2} + \frac{x^3(a+b\arcsin(cx))}{2c^2d^2\,(1-c^2x^2)} + \frac{3i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d^2} - \frac{(3ib)\text{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2c^5d^2} + \frac{(3ib)\text{Subst}\left(\int \frac{\log(1+ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2c^5d^2}$$

$$= -\frac{b}{2c^5d^2\sqrt{1-c^2x^2}} + \frac{b\sqrt{1-c^2x^2}}{c^5d^2} + \frac{3x(a+b\arcsin(cx))}{2c^4d^2} + \frac{x^3(a+b\arcsin(cx))}{2c^2d^2\,(1-c^2x^2)} + \frac{3i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d^2} - \frac{3ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{2c^5d^2} + \frac{3ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{2c^5d^2}$$

Mathematica [A] (verified)

Time = 0.58 (sec) , antiderivative size = 332, normalized size of antiderivative = 1.78

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx$$

$$= \frac{4acx + 4b\sqrt{1-c^2x^2} + \frac{b\sqrt{1-c^2x^2}}{-1+cx} - \frac{b\sqrt{1-c^2x^2}}{1+cx} - \frac{2acx}{-1+c^2x^2} + 3ib\pi\arcsin(cx) + 4bcx\arcsin(cx) + \frac{b\arcsin(cx)}{1-cx} - \frac{b\,\text{ar}}{}}{}$$

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] (4*a*c*x + 4*b*Sqrt[1 - c^2*x^2] + (b*Sqrt[1 - c^2*x^2])/(-1 + c*x) - (b*Sq
rt[1 - c^2*x^2])/(1 + c*x) - (2*a*c*x)/(-1 + c^2*x^2) + (3*I)*b*Pi*ArcSin[c
```

```
*x] + 4*b*c*x*ArcSin[c*x] + (b*ArcSin[c*x])/(1 - c*x) - (b*ArcSin[c*x])/(1
+ c*x) - 3*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 6*b*ArcSin[c*x]*Log[1 - I*E^
(I*ArcSin[c*x])] - 3*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 6*b*ArcSin[c*x]*Lo
g[1 + I*E^(I*ArcSin[c*x])] + 3*a*Log[1 - c*x] - 3*a*Log[1 + c*x] + 3*b*Pi*L
og[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 3*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]
- (6*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (6*I)*b*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(4*c^5*d^2)
```

Maple [A] (verified)

Time = 0.22 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.39

method	result
derivativedivides	$\frac{\frac{a\left(cx-\frac{1}{4(cx-1)}+\frac{3\ln(cx-1)}{4}-\frac{1}{4(cx+1)}-\frac{3\ln(cx+1)}{4}\right)}{d^2}+\frac{b\sqrt{-c^2x^2+1}}{d^2}+\frac{b\arcsin(cx)cx}{d^2}-\frac{b\arcsin(cx)cx}{2d^2\left(c^2x^2-1\right)}+\frac{b\sqrt{-c^2x^2+1}}{2d^2\left(c^2x^2-1\right)}+\frac{3b\arcsin(c\cdots}{\cdots}}{\cdots}$
default	$\frac{\frac{a\left(cx-\frac{1}{4(cx-1)}+\frac{3\ln(cx-1)}{4}-\frac{1}{4(cx+1)}-\frac{3\ln(cx+1)}{4}\right)}{d^2}+\frac{b\sqrt{-c^2x^2+1}}{d^2}+\frac{b\arcsin(cx)cx}{d^2}-\frac{b\arcsin(cx)cx}{2d^2\left(c^2x^2-1\right)}+\frac{b\sqrt{-c^2x^2+1}}{2d^2\left(c^2x^2-1\right)}+\frac{3b\arcsin(c\cdots}{\cdots}}{\cdots}$
parts	$\frac{a\left(\frac{x}{c^4}-\frac{1}{4c^5(cx-1)}+\frac{3\ln(cx-1)}{4c^5}-\frac{1}{4c^5(cx+1)}-\frac{3\ln(cx+1)}{4c^5}\right)}{d^2}+\frac{b\sqrt{-c^2x^2+1}}{c^5d^2}+\frac{b\arcsin(cx)x}{d^2c^4}-\frac{b\arcsin(cx)x}{2d^2c^4(c^2x^2-1)}+\frac{b\sqrt{-\cdots}}{2d^2c^5\cdots}$

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(a/d^2*(c*x-1/4/(c*x-1)+3/4*ln(c*x-1)-1/4/(c*x+1)-3/4*ln(c*x+1))+b/d^
2*(-c^2*x^2+1)^(1/2)+b/d^2*arcsin(c*x)*c*x-1/2*b/d^2/(c^2*x^2-1)*arcsin(c*x
)*c*x+1/2*b/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+3/2*b/d^2*arcsin(c*x)*ln(1+I
*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/2*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+
1)^(1/2)))-3/2*I*b/d^2*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/2*I*b/d^2*di
log(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))))
```

Fricas [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^2}\,dx=\int \frac{(b\arcsin\left(cx\right)+a)x^4}{\left(c^2dx^2-d\right)^2}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x
)
```

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \frac{\int \frac{ax^4}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{bx^4\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a*x**4/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x**4*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Maxima [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^4}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a*(2*x/(c^6*d^2*x^2 - c^4*d^2) - 4*x/(c^4*d^2) + 3*log(c*x + 1)/(c^5*d
^2) - 3*log(c*x - 1)/(c^5*d^2)) - 1/4*(3*(c^2*x^2 - 1)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 3*(c^2*x^2 - 1)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(2*c^3*x^3 - 3*c*x)*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)) + 4*(c^7*d^2*x^2 - c^5*d^2)*integrate(-1/4*(4*c
^3*x^3 - 6*c*x - 3*(c^2*x^2 - 1)*log(c*x + 1) + 3*(c^2*x^2 - 1)*log(-c*x +
1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^8*d^2*x^4 - 2*c^6*d^2*x^2 + c^4*d^2), x
))*b/(c^7*d^2*x^2 - c^5*d^2)
```

Giac [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^4}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^4/(c^2*d*x^2 - d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{x^4\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^2}\,dx$$

```
[In] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2,x)
[Out] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2, x)
```

3.38 $\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 155

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}}+\frac{b\arcsin(cx)}{2c^4d^2}+\frac{x^2(a+b\arcsin(cx))}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))^2}{2bc^4d^2}+\frac{(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d^2} - \frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2c^4d^2}$$

```
[Out] 1/2*b*arcsin(c*x)/c^4/d^2+1/2*x^2*(a+b*arcsin(c*x))/c^2/d^2/(-c^2*x^2+1)-1/
2*I*(a+b*arcsin(c*x))^2/b/c^4/d^2+(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1
)^(1/2))^2)/c^4/d^2-1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^4/d^
2-1/2*b*x/c^3/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {4791, 4765, 3800, 2221, 2317, 2438, 294, 222}

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = -\frac{i(a+b\arcsin(cx))^2}{2bc^4d^2}+\frac{\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^4d^2} + \frac{x^2(a+b\arcsin(cx))}{2c^2d^2(1-c^2x^2)}-\frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2c^4d^2} + \frac{b\arcsin(cx)}{2c^4d^2}-\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/2*(b*x)/(c^3*d^2*Sqrt[1 - c^2*x^2]) + (b*ArcSin[c*x])/(2*c^4*d^2) + (x^2
*(a + b*ArcSin[c*x]))/(2*c^2*d^2*(1 - c^2*x^2)) - ((I/2)*(a + b*ArcSin[c*x]
)^2)/(b*c^4*d^2) + ((a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c^
4*d^2) - ((I/2)*b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^4*d^2)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 294

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(
n - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*n*(p + 1))), x] - Dist[c^n
*((m - n + 1)/(b*n*(p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
```

```
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^2(a+b\arcsin(cx))}{2c^2d^2(1-c^2x^2)} - \frac{b\int \frac{x^2}{(1-c^2x^2)^{3/2}}\,dx}{2cd^2} - \frac{\int \frac{x(a+b\arcsin(cx))}{d-c^2dx^2}\,dx}{c^2d} \\
&= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x^2(a+b\arcsin(cx))}{2c^2d^2(1-c^2x^2)} \\
&\quad - \frac{\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{c^4d^2} + \frac{b\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{2c^3d^2} \\
&= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{b\arcsin(cx)}{2c^4d^2} + \frac{x^2(a+b\arcsin(cx))}{2c^2d^2(1-c^2x^2)} \\
&\quad - \frac{i(a+b\arcsin(cx))^2}{2bc^4d^2} + \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{c^4d^2} \\
&= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{b\arcsin(cx)}{2c^4d^2} + \frac{x^2(a+b\arcsin(cx))}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))^2}{2bc^4d^2} \\
&\quad + \frac{(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d^2} - \frac{b\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{c^4d^2} \\
&= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{b\arcsin(cx)}{2c^4d^2} + \frac{x^2(a+b\arcsin(cx))}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))^2}{2bc^4d^2} \\
&\quad + \frac{(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d^2} + \frac{(ib)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2c^4d^2} \\
&= -\frac{bx}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{b\arcsin(cx)}{2c^4d^2} + \frac{x^2(a+b\arcsin(cx))}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))^2}{2bc^4d^2} \\
&\quad + \frac{(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d^2} - \frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2c^4d^2}
\end{aligned}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 334 vs. 2(155) = 310.

Time = 0.57 (sec) , antiderivative size = 334, normalized size of antiderivative = 2.15

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx$$
$$= \frac{\frac{b\sqrt{1-c^2x^2}}{-1+cx}+\frac{b\sqrt{1-c^2x^2}}{1+cx}-\frac{2a}{-1+c^2x^2}+4ib\pi\arcsin(cx)+\frac{b\arcsin(cx)}{1-cx}+\frac{b\arcsin(cx)}{1+cx}-2ib\arcsin(cx)^2+8b\pi\log(1+e}{}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] ((b*Sqrt[1 - c^2*x^2])/(-1 + c*x) + (b*Sqrt[1 - c^2*x^2])/(1 + c*x) - (2*a)
/(-1 + c^2*x^2) + (4*I)*b*Pi*ArcSin[c*x] + (b*ArcSin[c*x])/(1 - c*x) + (b*A
rcSin[c*x])/(1 + c*x) - (2*I)*b*ArcSin[c*x]^2 + 8*b*Pi*Log[1 + E^((-I)*ArcS
in[c*x])] + 2*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 4*b*ArcSin[c*x]*Log[1 - I
*E^(I*ArcSin[c*x])] - 2*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 4*b*ArcSin[c*x]
*Log[1 + I*E^(I*ArcSin[c*x])] + 2*a*Log[1 - c^2*x^2] - 8*b*Pi*Log[Cos[ArcSi
n[c*x]/2]] + 2*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 2*b*Pi*Log[Sin[(Pi
+ 2*ArcSin[c*x])/4]] - (4*I)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (4*I)*b
*PolyLog[2, I*E^(I*ArcSin[c*x])])/(4*c^4*d^2)
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.04

method	result
derivativedivides	$\frac{\frac{a\left(-\frac{1}{4(cx-1)}+\frac{\ln(cx-1)}{2}+\frac{1}{4cx+4}+\frac{\ln(cx+1)}{2}\right)}{d^2}+\frac{b\left(-\frac{i\arcsin(cx)^2}{2}-\frac{ic^2x^2-cx\sqrt{-c^2x^2+1}+\arcsin(cx)-i}{2(c^2x^2-1)}+\arcsin(cx)\ln\left(1+\left(icx+\sqrt{}\right.\right.\right.}{d^2}}{c^4}$
default	$\frac{\frac{a\left(-\frac{1}{4(cx-1)}+\frac{\ln(cx-1)}{2}+\frac{1}{4cx+4}+\frac{\ln(cx+1)}{2}\right)}{d^2}+\frac{b\left(-\frac{i\arcsin(cx)^2}{2}-\frac{ic^2x^2-cx\sqrt{-c^2x^2+1}+\arcsin(cx)-i}{2(c^2x^2-1)}+\arcsin(cx)\ln\left(1+\left(icx+\sqrt{}\right.\right.\right.}{d^2}}{c^4}$
parts	$\frac{a\left(-\frac{1}{4c^4(cx-1)}+\frac{\ln(cx-1)}{2c^4}+\frac{1}{4c^4(cx+1)}+\frac{\ln(cx+1)}{2c^4}\right)}{d^2}+\frac{b\left(-\frac{i\arcsin(cx)^2}{2}-\frac{ic^2x^2-cx\sqrt{-c^2x^2+1}+\arcsin(cx)-i}{2(c^2x^2-1)}+\arcsin(cx)\ln\right.}{d^2c}$

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(a/d^2*(-1/4/(c*x-1)+1/2*ln(c*x-1)+1/4/(c*x+1)+1/2*ln(c*x+1))+b/d^2*(
-1/2*I*arcsin(c*x)^2-1/2*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)+arcsin(c*x)-I)/(
c^2*x^2-1)+arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*I*polylog(2,-
(I*c*x+(-c^2*x^2+1)^(1/2))^2)))
```

Fricas [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^3}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^3*arcsin(c*x) + a*x^3)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x
)
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \frac{\int \frac{ax^3}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{bx^3\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a*x**3/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x**3*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Maxima [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^3}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*(1/(c^6*d^2*x^2 - c^4*d^2) - log(c^2*x^2 - 1)/(c^4*d^2)) + 1/2*((c^2
*x^2 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) + (c^2*x^
2 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 2*(c^6*d^
2*x^2 - c^4*d^2)*integrate(1/2*((c^2*x^2 - 1)*e^(1/2*log(c*x + 1) + 1/2*log
(-c*x + 1))*log(c*x + 1) + (c^2*x^2 - 1)*e^(1/2*log(c*x + 1) + 1/2*log(-c*x
 + 1))*log(-c*x + 1) - e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1)))/(c^9*d^2*x
^6 - 2*c^7*d^2*x^4 + c^5*d^2*x^2 + (c^7*d^2*x^4 - 2*c^5*d^2*x^2 + c^3*d^2)*
e^(log(c*x + 1) + log(-c*x + 1))), x) - arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)))*b/(c^6*d^2*x^2 - c^4*d^2)
```

Giac [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^3}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^3/(c^2*d*x^2 - d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{x^3\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^2}\,dx$$

```
[In] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2,x)
[Out] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2, x)
```

3.39 $\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 144

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = -\frac{b}{2c^3d^2\sqrt{1-c^2x^2}}+\frac{x(a+b\arcsin(cx))}{2c^2d^2(1-c^2x^2)}+\frac{i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d^2}-\frac{ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{2c^3d^2}+\frac{ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{2c^3d^2}$$

```
[Out] 1/2*x*(a+b*arcsin(c*x))/c^2/d^2/(-c^2*x^2+1)+I*(a+b*arcsin(c*x))*arctan(I*c
*x+(-c^2*x^2+1)^(1/2))/c^3/d^2-1/2*I*b*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/
2)))/c^3/d^2+1/2*I*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d^2-1/2*b/
c^3/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4791, 4749, 4266, 2317, 2438, 267}

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \frac{i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^3d^2}+\frac{x(a+b\arcsin(cx))}{2c^2d^2(1-c^2x^2)}-\frac{ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{2c^3d^2}+\frac{ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{2c^3d^2}-\frac{b}{2c^3d^2\sqrt{1-c^2x^2}}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/2*b/(c^3*d^2*Sqrt[1 - c^2*x^2]) + (x*(a + b*ArcSin[c*x]))/(2*c^2*d^2*(1
- c^2*x^2)) + (I*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^3*d^2) -
 ((I/2)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^2) + ((I/2)*b*PolyLog[
2, I*E^(I*ArcSin[c*x])])/(c^3*d^2)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
```

```
[m, 1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{x(a+b\arcsin(cx))}{2c^2d^2\left(1-c^2x^2\right)} - \frac{b\int \frac{x}{\left(1-c^2x^2\right)^{3/2}}\,dx}{2cd^2} - \frac{\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx}{2c^2d} \\
&= -\frac{b}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{2c^2d^2\left(1-c^2x^2\right)} - \frac{\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{2c^3d^2} \\
&= -\frac{b}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{2c^2d^2\left(1-c^2x^2\right)} + \frac{i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d^2} \\
&\quad + \frac{b\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{2c^3d^2} - \frac{b\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{2c^3d^2} \\
&= -\frac{b}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{2c^2d^2\left(1-c^2x^2\right)} + \frac{i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d^2} \\
&\quad - \frac{(ib)\text{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2c^3d^2} + \frac{(ib)\text{Subst}\left(\int \frac{\log(1+ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2c^3d^2} \\
&= -\frac{b}{2c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{2c^2d^2\left(1-c^2x^2\right)} + \frac{i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d^2} \\
&\quad - \frac{ib\,\text{PolyLog}\left(2, -ie^{i\arcsin(cx)}\right)}{2c^3d^2} + \frac{ib\,\text{PolyLog}\left(2, ie^{i\arcsin(cx)}\right)}{2c^3d^2}
\end{aligned}
$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 463 vs. $2(144) = 288$.

Time = 0.41 (sec) , antiderivative size = 463, normalized size of antiderivative = 3.22

$$
\int \frac{x^2(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^2}\,dx = -\frac{ax}{2c^2d^2\left(-1+c^2x^2\right)} + \frac{a\log(1-cx)}{4c^3d^2} - \frac{a\log(1+cx)}{4c^3d^2} + b\left(\frac{\sqrt{1-c^2x^2}-\arcsin(cx)}{4c^3(-1+cx)} - \frac{\sqrt{1-c^2x^2}+\arcsin(cx)}{4c^2(c+c^2x)} + \frac{\frac{3i\pi\arcsin(cx)}{2c} - \frac{i\arcsin(cx)^2}{2c} + \frac{2\pi\log\left(1+e^{-i\arcsin(cx)}\right)}{c} - \frac{\pi\log\left(1+ie^{i\arcsin(cx)}\right)}{c} + \frac{2\arcsin(c\cdots}{}}{}\right.
$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/2*(a*x)/(c^2*d^2*(-1 + c^2*x^2)) + (a*Log[1 - c*x])/(4*c^3*d^2) - (a*Log
[1 + c*x])/(4*c^3*d^2) + (b*((Sqrt[1 - c^2*x^2] - ArcSin[c*x])/(4*c^3*(-1 +
 c*x)) - (Sqrt[1 - c^2*x^2] + ArcSin[c*x])/(4*c^2*(c + c^2*x)) + ((((3*I)/2
)*Pi*ArcSin[c*x])/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSi
```

```
n[c*x])])/c - (Pi*Log[1 + I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 +
I*E^(I*ArcSin[c*x])])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c + (Pi*Log[-Cos[(
Pi + 2*ArcSin[c*x])/4]])/c - ((2*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/c)/
(4*c^2) - (((I/2)*Pi*ArcSin[c*x])/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1
 + E^((-I)*ArcSin[c*x])])/c + (Pi*Log[1 - I*E^(I*ArcSin[c*x])])/c + (2*ArcS
in[c*x]*Log[1 - I*E^(I*ArcSin[c*x])])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c
- (Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])/c - ((2*I)*PolyLog[2, I*E^(I*ArcSin
[c*x])])/c)/(4*c^2)))/d^2
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 201, normalized size of antiderivative = 1.40

method	result
derivativedivides	$\frac{\frac{a\left(-\frac{1}{4(cx-1)}+\frac{\ln(cx-1)}{4}-\frac{1}{4(cx+1)}-\frac{\ln(cx+1)}{4}\right)}{d^2}+\frac{b\left(-\frac{cx\arcsin(cx)-\sqrt{-c^2x^2+1}}{2(c^2x^2-1)}+\frac{\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{2}-\ldots\right.}{}}{c^3}$
default	$\frac{\frac{a\left(-\frac{1}{4(cx-1)}+\frac{\ln(cx-1)}{4}-\frac{1}{4(cx+1)}-\frac{\ln(cx+1)}{4}\right)}{d^2}+\frac{b\left(-\frac{cx\arcsin(cx)-\sqrt{-c^2x^2+1}}{2(c^2x^2-1)}+\frac{\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{2}-\ldots\right.}{}}{c^3}$
parts	$\frac{a\left(-\frac{1}{4c^3(cx-1)}+\frac{\ln(cx-1)}{4c^3}-\frac{1}{4c^3(cx+1)}-\frac{\ln(cx+1)}{4c^3}\right)}{d^2}+\frac{b\left(-\frac{cx\arcsin(cx)-\sqrt{-c^2x^2+1}}{2(c^2x^2-1)}+\frac{\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{2}\ldots\right.}{}$

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(a/d^2*(-1/4/(c*x-1)+1/4*ln(c*x-1)-1/4/(c*x+1)-1/4*ln(c*x+1))+b/d^2*(
-1/2*(c*x*arcsin(c*x)-(-c^2*x^2+1)^(1/2))/(c^2*x^2-1)+1/2*arcsin(c*x)*ln(1+
I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1
/2)))-1/2*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/2*I*dilog(1-I*(I*c*x+(-
c^2*x^2+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx=\int \frac{(b\arcsin(cx)+a)x^2}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*arcsin(c*x) + a*x^2)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x
)
```

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \frac{\int \frac{ax^2}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{bx^2\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a*x**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x**2*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Maxima [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^2}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a*(2*x/(c^4*d^2*x^2 - c^2*d^2) + log(c*x + 1)/(c^3*d^2) - log(c*x - 1)
/(c^3*d^2)) - 1/4*(2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (c^2*
x^2 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - (c^2*x^2
 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 4*(c^5*d^2
*x^2 - c^3*d^2)*integrate(1/4*(2*c*x + (c^2*x^2 - 1)*log(c*x + 1) - (c^2*x^
2 - 1)*log(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d^2*x^4 - 2*c^4*d^2
*x^2 + c^2*d^2), x))*b/(c^5*d^2*x^2 - c^3*d^2)
```

Giac [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^2}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^2/(c^2*d*x^2 - d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx=\int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^2}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2,x)
[Out] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2, x)
```

3.40 $\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 57

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = -\frac{bx}{2cd^2\sqrt{1-c^2x^2}}+\frac{a+b\arcsin(cx)}{2c^2d^2\,(1-c^2x^2)}$$

```
[Out] 1/2*(a+b*arcsin(c*x))/c^2/d^2/(-c^2*x^2+1)-1/2*b*x/c/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {4767, 197}

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \frac{a+b\arcsin(cx)}{2c^2d^2\,(1-c^2x^2)}-\frac{bx}{2cd^2\sqrt{1-c^2x^2}}$$

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/2*(b*x)/(c*d^2*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(2*c^2*d^2*(1 -
c^2*x^2))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
```

```
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{a+b\arcsin(cx)}{2c^2d^2\left(1-c^2x^2\right)}-\frac{b\int\frac{1}{\left(1-c^2x^2\right)^{3/2}}\,dx}{2cd^2}\\&=-\frac{bx}{2cd^2\sqrt{1-c^2x^2}}+\frac{a+b\arcsin(cx)}{2c^2d^2\left(1-c^2x^2\right)}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.88

$$\int\frac{x(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^2}\,dx=\frac{a-bcx\sqrt{1-c^2x^2}+b\arcsin(cx)}{2c^2d^2-2c^4d^2x^2}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
[Out] (a - b*c*x*Sqrt[1 - c^2*x^2] + b*ArcSin[c*x])/(2*c^2*d^2 - 2*c^4*d^2*x^2)
```

Maple [A] (verified)

Time = 0.10 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.72

method	result	size
derivativedivides	$\frac{-\frac{a}{2d^2\left(c^2x^2-1\right)}+\frac{b\left(-\frac{\arcsin(cx)}{2\left(c^2x^2-1\right)}+\frac{\sqrt{-(cx-1)^2-2cx+2}}{4cx-4}+\frac{\sqrt{-(cx+1)^2+2cx+2}}{4cx+4}\right)}{d^2}}{c^2}$	98
default	$\frac{-\frac{a}{2d^2\left(c^2x^2-1\right)}+\frac{b\left(-\frac{\arcsin(cx)}{2\left(c^2x^2-1\right)}+\frac{\sqrt{-(cx-1)^2-2cx+2}}{4cx-4}+\frac{\sqrt{-(cx+1)^2+2cx+2}}{4cx+4}\right)}{d^2}}{c^2}$	98
parts	$-\frac{a}{2d^2c^2(c^2x^2-1)}+\frac{b\left(-\frac{\arcsin(cx)}{2\left(c^2x^2-1\right)}+\frac{\sqrt{-(cx-1)^2-2cx+2}}{4cx-4}+\frac{\sqrt{-(cx+1)^2+2cx+2}}{4cx+4}\right)}{d^2c^2}$	100

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
[Out] 1/c^2*(-1/2*a/d^2/(c^2*x^2-1)+b/d^2*(-1/2/(c^2*x^2-1)*arcsin(c*x)+1/4/(c*x-
1)*(-(c*x-1)^2-2*c*x+2)^(1/2)+1/4/(c*x+1)*(-(c*x+1)^2+2*c*x+2)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.96

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = -\frac{ac^2x^2 - \sqrt{-c^2x^2+1}bcx + b\arcsin(cx)}{2\left(c^4d^2x^2 - c^2d^2\right)}$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
[Out] -1/2*(a*c^2*x^2 - sqrt(-c^2*x^2 + 1)*b*c*x + b*arcsin(c*x))/(c^4*d^2*x^2 -
c^2*d^2)
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \frac{\int \frac{ax}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{bx\,\mathrm{asin}\,(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
[Out] (Integral(a*x/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x*asin(c*x)/(c
**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 136 vs. 2(50) = 100.

Time = 0.28 (sec) , antiderivative size = 136, normalized size of antiderivative = 2.39

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \frac{1}{4}\left(\left(\frac{\sqrt{-c^2x^2+1}c^2d^2}{c^7d^4x+c^6d^4} + \frac{\sqrt{-c^2x^2+1}c^2d^2}{c^7d^4x-c^6d^4}\right)c^2 - \frac{2\,\arcsin(cx)}{c^4d^2x^2-c^2d^2}\right)b - \frac{a}{2\left(c^4d^2x^2-c^2d^2\right)}$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
[Out] 1/4*((sqrt(-c^2*x^2 + 1)*c^2*d^2/(c^7*d^4*x + c^6*d^4) + sqrt(-c^2*x^2 + 1)
*c^2*d^2/(c^7*d^4*x - c^6*d^4))*c^2 - 2*arcsin(c*x)/(c^4*d^2*x^2 - c^2*d^2)
)*b - 1/2*a/(c^4*d^2*x^2 - c^2*d^2)
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.56

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = -\frac{bx^2\arcsin{(cx)}}{2\,(c^2x^2-1)d^2} - \frac{ax^2}{2\,(c^2x^2-1)d^2} - \frac{bx}{2\,\sqrt{-c^2x^2+1}cd^2} + \frac{b\arcsin{(cx)}}{2\,c^2d^2} + \frac{a}{2\,c^2d^2}$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] -1/2*b*x^2*arcsin(c*x)/((c^2*x^2 - 1)*d^2) - 1/2*a*x^2/((c^2*x^2 - 1)*d^2)
- 1/2*b*x/(sqrt(-c^2*x^2 + 1)*c*d^2) + 1/2*b*arcsin(c*x)/(c^2*d^2) + 1/2*a/
(c^2*d^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{x\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^2}\,dx$$

```
[In] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2,x)
```

```
[Out] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2, x)
```

3.41 $\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 141

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^2}\,dx = -\frac{b}{2cd^2\sqrt{1-c^2x^2}}+\frac{x(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{cd^2} + \frac{ib\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{2cd^2}-\frac{ib\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{2cd^2}$$

```
[Out] 1/2*x*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)-I*(a+b*arcsin(c*x))*arctan(I*c*x+(
-c^2*x^2+1)^(1/2))/c/d^2+1/2*I*b*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c
/d^2-1/2*I*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2-1/2*b/c/d^2/(-c^
2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4747, 4749, 4266, 2317, 2438, 267}

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^2}\,dx = -\frac{i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{cd^2} + \frac{x(a+b\arcsin(cx))}{2d^2(1-c^2x^2)}+\frac{ib\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{2cd^2} - \frac{ib\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{2cd^2}-\frac{b}{2cd^2\sqrt{1-c^2x^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/2*b/(c*d^2*Sqrt[1 - c^2*x^2]) + (x*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*
x^2)) - (I*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*d^2) + ((I/2)*
b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^2) - ((I/2)*b*PolyLog[2, I*E^(I*
ArcSin[c*x])])/(c*d^2)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{x(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} - \frac{(bc)\int \frac{x}{(1-c^2x^2)^{3/2}}\,dx}{2d^2} + \frac{\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx}{2d}$$

$$= -\frac{b}{2cd^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} + \frac{\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{2cd^2}$$

$$= -\frac{b}{2cd^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{cd^2} - \frac{b\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{2cd^2} + \frac{b\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{2cd^2}$$

$$= -\frac{b}{2cd^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{cd^2} + \frac{(ib)\text{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2cd^2} - \frac{(ib)\text{Subst}\left(\int \frac{\log(1+ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2cd^2}$$

$$= -\frac{b}{2cd^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{cd^2} + \frac{ib\,\text{PolyLog}\left(2, -ie^{i\arcsin(cx)}\right)}{2cd^2} - \frac{ib\,\text{PolyLog}\left(2, ie^{i\arcsin(cx)}\right)}{2cd^2}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 334 vs. 2(141) = 282.

Time = 0.68 (sec) , antiderivative size = 334, normalized size of antiderivative = 2.37

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^2}\,dx =$$

$$-\frac{\frac{b\sqrt{1-c^2x^2}}{c-c^2x} + \frac{b\sqrt{1-c^2x^2}}{c+c^2x} + \frac{2ax}{-1+c^2x^2} + \frac{ib\pi\arcsin(cx)}{c} + \frac{b\arcsin(cx)}{c(-1+cx)} + \frac{b\arcsin(cx)}{c+c^2x} - \frac{b\pi\log\left(1-ie^{i\arcsin(cx)}\right)}{c} - \frac{2b\arcsin(cx)\log(1-}{c}}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^2,x]
```

```
[Out] -1/4*((b*Sqrt[1 - c^2*x^2])/(c - c^2*x) + (b*Sqrt[1 - c^2*x^2])/(c + c^2*x)
 + (2*a*x)/(-1 + c^2*x^2) + (I*b*Pi*ArcSin[c*x])/c + (b*ArcSin[c*x])/(c*(-1
 + c*x)) + (b*ArcSin[c*x])/(c + c^2*x) - (b*Pi*Log[1 - I*E^(I*ArcSin[c*x])]
)/c - (2*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])])/c - (b*Pi*Log[1 + I*E^
(I*ArcSin[c*x])])/c + (2*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])])/c + (a
*Log[1 - c*x])/c - (a*Log[1 + c*x])/c + (b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])
/4]])/c + (b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])/c - ((2*I)*b*PolyLog[2, (
-I)*E^(I*ArcSin[c*x])])/c + ((2*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/c)/d^
2
```

Maple [A] (verified)

Time = 0.17 (sec) , antiderivative size = 201, normalized size of antiderivative = 1.43

method	result
derivativedivides	$\frac{\frac{a\left(-\frac{1}{4(cx-1)}-\frac{\ln(cx-1)}{4}-\frac{1}{4(cx+1)}+\frac{\ln(cx+1)}{4}\right)}{d^2}+\frac{b\left(-\frac{cx\arcsin(cx)-\sqrt{-c^2x^2+1}}{2\left(c^2x^2-1\right)}-\frac{\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{2}+\cdots\right.}{}}{c}$
default	$\frac{\frac{a\left(-\frac{1}{4(cx-1)}-\frac{\ln(cx-1)}{4}-\frac{1}{4(cx+1)}+\frac{\ln(cx+1)}{4}\right)}{d^2}+\frac{b\left(-\frac{cx\arcsin(cx)-\sqrt{-c^2x^2+1}}{2\left(c^2x^2-1\right)}-\frac{\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{2}+\cdots\right.}{}}{c}$
parts	$\frac{a\left(-\frac{1}{4c(cx-1)}-\frac{\ln(cx-1)}{4c}-\frac{1}{4c(cx+1)}+\frac{\ln(cx+1)}{4c}\right)}{d^2}+\frac{b\left(-\frac{cx\arcsin(cx)-\sqrt{-c^2x^2+1}}{2\left(c^2x^2-1\right)}-\frac{\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{2}+\cdots\right.}{}$

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a/d^2*(-1/4/(c*x-1)-1/4*ln(c*x-1)-1/4/(c*x+1)+1/4*ln(c*x+1))+b/d^2*(-1
/2*(c*x*arcsin(c*x)-(-c^2*x^2+1)^(1/2))/(c^2*x^2-1)-1/2*arcsin(c*x)*ln(1+I*
(I*c*x+(-c^2*x^2+1)^(1/2)))+1/2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2
)))+1/2*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/2*I*dilog(1-I*(I*c*x+(-c^
2*x^2+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{\left(d-c^2dx^2\right)^2}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{\left(d-c^2dx^2\right)^2}\,dx=\frac{\int \frac{a}{c^4x^4-2c^2x^2+1}\,dx+\int \frac{b\operatorname{asin}\left(cx\right)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*asin(c*x)/(c**4*
x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Maxima [F]

$$\int \frac{a + b\arcsin(cx)}{(d - c^2dx^2)^2} \, dx = \int \frac{b\arcsin(cx) + a}{(c^2dx^2 - d)^2} \, dx$$

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a*(2*x/(c^2*d^2*x^2 - d^2) - log(c*x + 1)/(c*d^2) + log(c*x - 1)/(c*d^
2)) - 1/4*(2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (c^2*x^2 - 1)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) + (c^2*x^2 - 1)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 4*(c^3*d^2*x^2 - c
*d^2)*integrate(-1/4*(2*c*x - (c^2*x^2 - 1)*log(c*x + 1) + (c^2*x^2 - 1)*lo
g(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^
2), x))*b/(c^3*d^2*x^2 - c*d^2)
```

Giac [F]

$$\int \frac{a + b\arcsin(cx)}{(d - c^2dx^2)^2} \, dx = \int \frac{b\arcsin(cx) + a}{(c^2dx^2 - d)^2} \, dx$$

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(c^2*d*x^2 - d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b\arcsin(cx)}{(d - c^2dx^2)^2} \, dx = \int \frac{a + b\,\mathrm{asin}(c\,x)}{(d - c^2\,d\,x^2)^2} \, dx$$

```
[In] int((a + b*asin(c*x))/(d - c^2*d*x^2)^2,x)
```

```
[Out] int((a + b*asin(c*x))/(d - c^2*d*x^2)^2, x)
```

3.42 $\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 122

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^2}\,dx=-\frac{bcx}{2d^2\sqrt{1-c^2x^2}}+\frac{a+b\arcsin(cx)}{2d^2\left(1-c^2x^2\right)}-\frac{2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2}+\frac{ib\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2d^2}-\frac{ib\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^2}$$

```
[Out] 1/2*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)-2*(a+b*arcsin(c*x))*arctanh((I*c*x+(
-c^2*x^2+1)^(1/2))^2)/d^2+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/
d^2-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-1/2*b*c*x/d^2/(-c^2
*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {4793, 4769, 4504, 4268, 2317, 2438, 197}

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^2}\,dx=-\frac{2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2}+\frac{a+b\arcsin(cx)}{2d^2\left(1-c^2x^2\right)}+\frac{ib\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2d^2}-\frac{ib\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^2}-\frac{bcx}{2d^2\sqrt{1-c^2x^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/2*(b*c*x)/(d^2*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(2*d^2*(1 - c^2*
x^2)) - (2*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^2 + ((I/2)
*b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^2 - ((I/2)*b*PolyLog[2, E^((2*I)*A
rcSin[c*x])])/d^2
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
```

```
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rubi steps

$$\text{integral} = \frac{a+b\arcsin(cx)}{2d^2(1-c^2x^2)} - \frac{(bc)\int \frac{1}{(1-c^2x^2)^{3/2}}\,dx}{2d^2} + \frac{\int \frac{a+b\arcsin(cx)}{x(d-c^2dx^2)}\,dx}{d}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\arcsin(cx)}{2d^2(1-c^2x^2)} + \frac{\text{Subst}\left(\int (a+bx)\csc(x)\sec(x)\,dx, x, \arcsin(cx)\right)}{d^2}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\arcsin(cx)}{2d^2(1-c^2x^2)} + \frac{2\text{Subst}\left(\int (a+bx)\csc(2x)\,dx, x, \arcsin(cx)\right)}{d^2}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\arcsin(cx)}{2d^2(1-c^2x^2)} - \frac{2(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2} - \frac{b\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^2} + \frac{b\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^2}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\arcsin(cx)}{2d^2(1-c^2x^2)} - \frac{2(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2} + \frac{(ib)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2d^2} - \frac{(ib)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2d^2}$$

$$= -\frac{bcx}{2d^2\sqrt{1-c^2x^2}} + \frac{a+b\arcsin(cx)}{2d^2(1-c^2x^2)} - \frac{2(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2} + \frac{ib\,\text{PolyLog}\left(2, -e^{2i\arcsin(cx)}\right)}{2d^2} - \frac{ib\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)}{2d^2}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 364 vs. 2(122) = 244.

Time = 0.57 (sec) , antiderivative size = 364, normalized size of antiderivative = 2.98

$$\int \frac{a+b\arcsin(cx)}{x(d-c^2dx^2)^2}\,dx = \frac{\frac{b\sqrt{1-c^2x^2}}{-1+cx} + \frac{b\sqrt{1-c^2x^2}}{1+cx} - \frac{2a}{-1+c^2x^2} - 4ib\pi\arcsin(cx) + \frac{b\arcsin(cx)}{1-cx} + \frac{b\arcsin(cx)}{1+cx} - 8b\pi\log\left(1+e^{-i\arcsin(cx)}\right) - 2b\pi}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^2),x]
```

[Out] ((b*Sqrt[1 - c^2*x^2])/(-1 + c*x) + (b*Sqrt[1 - c^2*x^2])/(1 + c*x) - (2*a)
/(-1 + c^2*x^2) - (4*I)*b*Pi*ArcSin[c*x] + (b*ArcSin[c*x])/(1 - c*x) + (b*A
rcSin[c*x])/(1 + c*x) - 8*b*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*b*Pi*Log[1
 - I*E^(I*ArcSin[c*x])] - 4*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*
b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] - 4*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c
*x])] + 4*b*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 4*a*Log[x] - 2*a*L
og[1 - c^2*x^2] + 8*b*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*b*Pi*Log[-Cos[(Pi + 2*
ArcSin[c*x])/4]] + 2*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*b*PolyLo
g[2, (-I)*E^(I*ArcSin[c*x])] + (4*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])] - (2
*I)*b*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(4*d^2)

Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 251, normalized size of antiderivative = 2.06

method	result
parts	$\frac{a\left(\ln(x)-\frac{1}{4(cx-1)}-\frac{\ln(cx-1)}{2}+\frac{1}{4cx+4}-\frac{\ln(cx+1)}{2}\right)}{d^2}+\frac{b\left(-\frac{ic^2x^2-cx\sqrt{-c^2x^2+1}+\arcsin(cx)-i}{2\left(c^2x^2-1\right)}+\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x\right.\right.}{}$
derivativedivides	$\frac{a\left(\ln(cx)-\frac{1}{4(cx-1)}-\frac{\ln(cx-1)}{2}+\frac{1}{4cx+4}-\frac{\ln(cx+1)}{2}\right)}{d^2}+\frac{b\left(-\frac{ic^2x^2-cx\sqrt{-c^2x^2+1}+\arcsin(cx)-i}{2\left(c^2x^2-1\right)}+\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2\right.\right.}{}$
default	$\frac{a\left(\ln(cx)-\frac{1}{4(cx-1)}-\frac{\ln(cx-1)}{2}+\frac{1}{4cx+4}-\frac{\ln(cx+1)}{2}\right)}{d^2}+\frac{b\left(-\frac{ic^2x^2-cx\sqrt{-c^2x^2+1}+\arcsin(cx)-i}{2\left(c^2x^2-1\right)}+\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2\right.\right.}{}$

[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)

[Out] a/d^2*(ln(x)-1/4/(c*x-1)-1/2*ln(c*x-1)+1/4/(c*x+1)-1/2*ln(c*x+1))+b/d^2*(-1
/2*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)+arcsin(c*x)-I)/(c^2*x^2-1)+arcsin(c*x)
*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))
^2)+arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*polylog(2,-I*c*x-(-c^2*x^2
+1)^(1/2))+1/2*I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-I*polylog(2,I*c*x
+(-c^2*x^2+1)^(1/2)))

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^2}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^2x}\,dx$$

[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^2,x, algorithm="fricas")

[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x), x)

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^2}\,dx = \frac{\int \frac{a}{c^4x^5-2c^2x^3+x}\,dx + \int \frac{b\,\mathrm{asin}\,(cx)}{c^4x^5-2c^2x^3+x}\,dx}{d^2}$$

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a/(c**4*x**5 - 2*c**2*x**3 + x), x) + Integral(b*asin(c*x)/(c**4*
x**5 - 2*c**2*x**3 + x), x))/d**2
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^2}\,dx = \int \frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^2x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*(1/(c^2*d^2*x^2 - d^2) + log(c*x + 1)/d^2 + log(c*x - 1)/d^2 - 2*log
(x)/d^2) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*
x^5 - 2*c^2*d^2*x^3 + d^2*x), x)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^2}\,dx = \int \frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^2x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^2*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^2}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{x\,\left(d-c^2\,d\,x^2\right)^2}\,dx$$

```
[In] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^2),x)
```

```
[Out] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^2), x)
```

3.43 $\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 186

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^2}\,dx=-\frac{bc}{2d^2\sqrt{1-c^2x^2}}-\frac{a+b\arcsin(cx)}{d^2x\left(1-c^2x^2\right)}+\frac{3c^2x(a+b\arcsin(cx))}{2d^2\left(1-c^2x^2\right)}-\frac{3ic(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d^2}-\frac{b\text{carctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2}+\frac{3ibc\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{2d^2}-\frac{3ibc\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{2d^2}$$

```
[Out] (-a-b*arcsin(c*x))/d^2/x/(-c^2*x^2+1)+3/2*c^2*x*(a+b*arcsin(c*x))/d^2/(-c^2
*x^2+1)-3*I*c*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d^2-b*c*ar
ctanh((-c^2*x^2+1)^(1/2))/d^2+3/2*I*b*c*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1
/2)))/d^2-3/2*I*b*c*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-1/2*b*c/d^2
/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {4789, 4747, 4749, 4266, 2317, 2438, 267, 272, 53, 65, 214}

$$\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)^2}\,dx = -\frac{3ic\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2} + \frac{3c^2x(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} - \frac{a+b\arcsin(cx)}{d^2x(1-c^2x^2)} + \frac{3ibc\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{2d^2} - \frac{3ibc\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{2d^2} - \frac{b c\,\mathrm{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2} - \frac{bc}{2d^2\sqrt{1-c^2x^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/2*(b*c)/(d^2*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*x])/(d^2*x*(1 - c^2*x^
2)) + (3*c^2*x*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*x^2)) - ((3*I)*c*(a + b
*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (b*c*ArcTanh[Sqrt[1 - c^2*x^
2]])/d^2 + (((3*I)/2)*b*c*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^2 - (((3*I)
/2)*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2
```

Rule 53

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{a+b\arcsin(cx)}{d^2x\left(1-c^2x^2\right)}+\left(3c^2\right)\int\frac{a+b\arcsin(cx)}{\left(d-c^2dx^2\right)^2}\,dx+\frac{(bc)\int\frac{1}{x(1-c^2x^2)^{3/2}}\,dx}{d^2}$$

$$= -\frac{a+b\arcsin(cx)}{d^2x\left(1-c^2x^2\right)}+\frac{3c^2x(a+b\arcsin(cx))}{2d^2\left(1-c^2x^2\right)}+\frac{(bc)\text{Subst}\left(\int\frac{1}{x(1-c^2x)^{3/2}}\,dx,x,x^2\right)}{2d^2} - \frac{\left(3bc^3\right)\int\frac{x}{(1-c^2x^2)^{3/2}}\,dx}{2d^2}+\frac{\left(3c^2\right)\int\frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx}{2d}$$

$$= -\frac{bc}{2d^2\sqrt{1-c^2x^2}}-\frac{a+b\arcsin(cx)}{d^2x\left(1-c^2x^2\right)}+\frac{3c^2x(a+b\arcsin(cx))}{2d^2\left(1-c^2x^2\right)} + \frac{(3c)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{2d^2}+\frac{(bc)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2d^2}$$

$$= -\frac{bc}{2d^2\sqrt{1-c^2x^2}}-\frac{a+b\arcsin(cx)}{d^2x\left(1-c^2x^2\right)}+\frac{3c^2x(a+b\arcsin(cx))}{2d^2\left(1-c^2x^2\right)} - \frac{3ic(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d^2}-\frac{b\text{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{cd^2} - \frac{(3bc)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{2d^2} + \frac{(3bc)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{2d^2}$$

$$= -\frac{bc}{2d^2\sqrt{1-c^2x^2}}-\frac{a+b\arcsin(cx)}{d^2x\left(1-c^2x^2\right)}+\frac{3c^2x(a+b\arcsin(cx))}{2d^2\left(1-c^2x^2\right)} - \frac{3ic(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d^2}-\frac{b\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2} + \frac{(3ibc)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{2d^2} - \frac{(3ibc)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{2d^2}$$

$$= -\frac{bc}{2d^2\sqrt{1-c^2x^2}} - \frac{a+b\arcsin(cx)}{d^2x(1-c^2x^2)} + \frac{3c^2x(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} - \frac{3ic(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d^2} - \frac{b\text{carctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2} + \frac{3ibc\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{2d^2} - \frac{3ibc\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{2d^2}$$

Mathematica [A] (verified)

Time = 1.09 (sec) , antiderivative size = 348, normalized size of antiderivative = 1.87

$$\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)^2}\,dx = -\frac{\frac{4a}{x} + \frac{bc\sqrt{1-c^2x^2}}{1-cx} + \frac{bc\sqrt{1-c^2x^2}}{1+cx} + \frac{2ac^2x}{-1+c^2x^2} + 3ibc\pi\arcsin(cx) + \frac{4b\arcsin(cx)}{x} + \frac{bc\arcsin(cx)}{-1+cx} + \frac{bc\arcsin(cx)}{1+cx} + 4b\text{carcta}}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/4*((4*a)/x + (b*c*Sqrt[1 - c^2*x^2])/(1 - c*x) + (b*c*Sqrt[1 - c^2*x^2])
/(1 + c*x) + (2*a*c^2*x)/(-1 + c^2*x^2) + (3*I)*b*c*Pi*ArcSin[c*x] + (4*b*A
rcSin[c*x])/x + (b*c*ArcSin[c*x])/(-1 + c*x) + (b*c*ArcSin[c*x])/(1 + c*x)
+ 4*b*c*ArcTanh[Sqrt[1 - c^2*x^2]] - 3*b*c*Pi*Log[1 - I*E^(I*ArcSin[c*x])]
- 6*b*c*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 3*b*c*Pi*Log[1 + I*E^(I*
ArcSin[c*x])] + 6*b*c*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 3*a*c*Log[
1 - c*x] - 3*a*c*Log[1 + c*x] + 3*b*c*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]
+ 3*b*c*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (6*I)*b*c*PolyLog[2, (-I)*E^(
I*ArcSin[c*x])] + (6*I)*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2
```

Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 268, normalized size of antiderivative = 1.44

method	result
derivativedivides	$c\left(\frac{a\left(-\frac{1}{cx}-\frac{1}{4(cx-1)}-\frac{3\ln(cx-1)}{4}-\frac{1}{4(cx+1)}+\frac{3\ln(cx+1)}{4}\right)}{d^2}+\frac{b\left(-\frac{3c^2x^2\arcsin(cx)-cx\sqrt{-c^2x^2+1}-2\arcsin(cx)}{2cx(c^2x^2-1)}+\ln\left(icx+\sqrt{-}\right.\right.}{}\right.$
default	$c\left(\frac{a\left(-\frac{1}{cx}-\frac{1}{4(cx-1)}-\frac{3\ln(cx-1)}{4}-\frac{1}{4(cx+1)}+\frac{3\ln(cx+1)}{4}\right)}{d^2}+\frac{b\left(-\frac{3c^2x^2\arcsin(cx)-cx\sqrt{-c^2x^2+1}-2\arcsin(cx)}{2cx(c^2x^2-1)}+\ln\left(icx+\sqrt{-}\right.\right.}{}\right.$
parts	$\frac{a\left(-\frac{1}{x}-\frac{c}{4(cx-1)}-\frac{3c\ln(cx-1)}{4}-\frac{c}{4(cx+1)}+\frac{3c\ln(cx+1)}{4}\right)}{d^2}+\frac{bc\left(-\frac{3c^2x^2\arcsin(cx)-cx\sqrt{-c^2x^2+1}-2\arcsin(cx)}{2cx(c^2x^2-1)}+\ln\left(icx+\sqrt{-c^2}\right.\right.}{}$

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] c*(a/d^2*(-1/c/x-1/4/(c*x-1)-3/4*ln(c*x-1)-1/4/(c*x+1)+3/4*ln(c*x+1))+b/d^2
*(-1/2*(3*c^2*x^2*arcsin(c*x)-c*x*(-c^2*x^2+1)^(1/2)-2*arcsin(c*x))/c/x/(c^
2*x^2-1)+ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-3/2*
arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/2*arcsin(c*x)*ln(1-I*(I*c*
x+(-c^2*x^2+1)^(1/2)))+3/2*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/2*I*di
log(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^2}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^2x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^6 - 2*c^2*d^2*x^4 + d^2*x^2), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^2}\,dx=\frac{\int \frac{a}{c^4x^6-2c^2x^4+x^2}\,dx+\int \frac{b\operatorname{asin}\left(cx\right)}{c^4x^6-2c^2x^4+x^2}\,dx}{d^2}$$

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a/(c**4*x**6 - 2*c**2*x**4 + x**2), x) + Integral(b*asin(c*x)/(c*
*4*x**6 - 2*c**2*x**4 + x**2), x))/d**2
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^2}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^2x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a*(2*(3*c^2*x^2 - 2)/(c^2*d^2*x^3 - d^2*x) - 3*c*log(c*x + 1)/d^2 + 3*
c*log(c*x - 1)/d^2) + 1/4*(3*(c^3*x^3 - c*x)*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1))*log(c*x + 1) - 3*(c^3*x^3 - c*x)*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1))*log(-c*x + 1) - 2*(3*c^2*x^2 - 2)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)) + 4*(c^2*d^2*x^3 - d^2*x)*integrate(-1/4*(6*c^3*x^2 - 3*(c^
4*x^3 - c^2*x)*log(c*x + 1) + 3*(c^4*x^3 - c^2*x)*log(-c*x + 1) - 4*c)*sqrt
(c*x + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x), x))*b/(c^2*
d^2*x^3 - d^2*x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^2}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^2}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{x^2\,\left(d-c^2\,d\,x^2\right)^2}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^2),x)
[Out] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^2), x)
```

3.44 $\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 159

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^2}\,dx = -\frac{bc}{2d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\arcsin(cx))}{d^2(1-c^2x^2)}-\frac{a+b\arcsin(cx)}{2d^2x^2(1-c^2x^2)}-\frac{4c^2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2}+\frac{ibc^2\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^2}-\frac{ibc^2\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2}$$

```
[Out] c^2*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)+1/2*(-a-b*arcsin(c*x))/d^2/x^2/(-c^2
*x^2+1)-4*c^2*(a+b*arcsin(c*x))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2+I
*b*c^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-I*b*c^2*polylog(2,(I*c*
x+(-c^2*x^2+1)^(1/2))^2)/d^2-1/2*b*c/d^2/x/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {4789, 4793, 4769, 4504, 4268, 2317, 2438, 197, 277}

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^2}\,dx = -\frac{4c^2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2}+\frac{c^2(a+b\arcsin(cx))}{d^2(1-c^2x^2)}-\frac{a+b\arcsin(cx)}{2d^2x^2(1-c^2x^2)}+\frac{ibc^2\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^2}-\frac{ibc^2\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2}-\frac{bc}{2d^2x\sqrt{1-c^2x^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/2*(b*c)/(d^2*x*Sqrt[1 - c^2*x^2]) + (c^2*(a + b*ArcSin[c*x]))/(d^2*(1 -
c^2*x^2)) - (a + b*ArcSin[c*x])/(2*d^2*x^2*(1 - c^2*x^2)) - (4*c^2*(a + b*A
rcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^2 + (I*b*c^2*PolyLog[2, -E^((
2*I)*ArcSin[c*x])])/d^2 - (I*b*c^2*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^2
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
```

```
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx)}{2d^2x^2\left(1-c^2x^2\right)}+\left(2c^2\right)\int\frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^2}\,dx+\frac{(bc)\int\frac{1}{x^2\left(1-c^2x^2\right)^{3/2}}\,dx}{2d^2}\\
&= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\arcsin(cx))}{d^2\left(1-c^2x^2\right)}-\frac{a+b\arcsin(cx)}{2d^2x^2\left(1-c^2x^2\right)}+\frac{\left(2c^2\right)\int\frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)}\,dx}{d}\\
&= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\arcsin(cx))}{d^2\left(1-c^2x^2\right)}-\frac{a+b\arcsin(cx)}{2d^2x^2\left(1-c^2x^2\right)}\\
&\quad+\frac{\left(2c^2\right)\operatorname{Subst}\left(\int(a+bx)\csc(x)\sec(x)\,dx,x,\arcsin(cx)\right)}{d^2}\\
&= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\arcsin(cx))}{d^2\left(1-c^2x^2\right)}-\frac{a+b\arcsin(cx)}{2d^2x^2\left(1-c^2x^2\right)}\\
&\quad+\frac{\left(4c^2\right)\operatorname{Subst}\left(\int(a+bx)\csc(2x)\,dx,x,\arcsin(cx)\right)}{d^2}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}} + \frac{c^2(a+b\arcsin(cx))}{d^2(1-c^2x^2)} - \frac{a+b\arcsin(cx)}{2d^2x^2(1-c^2x^2)} \\
&\quad - \frac{4c^2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2} \\
&\quad - \frac{(2bc^2)\,\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^2} \\
&\quad + \frac{(2bc^2)\,\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^2} \\
&= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}} + \frac{c^2(a+b\arcsin(cx))}{d^2(1-c^2x^2)} - \frac{a+b\arcsin(cx)}{2d^2x^2(1-c^2x^2)} \\
&\quad - \frac{4c^2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2} \\
&\quad + \frac{(ibc^2)\,\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{d^2} \\
&\quad - \frac{(ibc^2)\,\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{d^2} \\
&= -\frac{bc}{2d^2x\sqrt{1-c^2x^2}} + \frac{c^2(a+b\arcsin(cx))}{d^2(1-c^2x^2)} - \frac{a+b\arcsin(cx)}{2d^2x^2(1-c^2x^2)} \\
&\quad - \frac{4c^2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2} \\
&\quad + \frac{ibc^2\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^2} - \frac{ibc^2\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2}
\end{aligned}
$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 461 vs. $2(159) = 318$.

Time = 0.80 (sec) , antiderivative size = 461, normalized size of antiderivative = 2.90

$$
\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^2}\,dx
= \frac{-\frac{2a}{x^2} - \frac{2bc\sqrt{1-c^2x^2}}{x} + \frac{bc^2\sqrt{1-c^2x^2}}{-1+cx} + \frac{bc^2\sqrt{1-c^2x^2}}{1+cx} - \frac{2ac^2}{-1+c^2x^2} - 8ibc^2\pi\arcsin(cx) - \frac{2b\arcsin(cx)}{x^2} + \frac{bc^2\arcsin(cx)}{1-cx} + \frac{bc^2\,\text{arc}}{1+}}{}
$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^2),x]
```

```
[Out] ((-2*a)/x^2 - (2*b*c*Sqrt[1 - c^2*x^2])/x + (b*c^2*Sqrt[1 - c^2*x^2])/(-1 +
 c*x) + (b*c^2*Sqrt[1 - c^2*x^2])/(1 + c*x) - (2*a*c^2)/(-1 + c^2*x^2) - (8
*I)*b*c^2*Pi*ArcSin[c*x] - (2*b*ArcSin[c*x])/x^2 + (b*c^2*ArcSin[c*x])/(1 -
 c*x) + (b*c^2*ArcSin[c*x])/(1 + c*x) - 16*b*c^2*Pi*Log[1 + E^((-I)*ArcSin[
c*x])] - 4*b*c^2*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 8*b*c^2*ArcSin[c*x]*Log[
```

```
1 - I*E^(I*ArcSin[c*x])] + 4*b*c^2*Pi*Log[1 + I*E^(I*ArcSin[c*x])] - 8*b*c^
2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 8*b*c^2*ArcSin[c*x]*Log[1 - E^
((2*I)*ArcSin[c*x])] + 8*a*c^2*Log[x] - 4*a*c^2*Log[1 - c^2*x^2] + 16*b*c^2
*Pi*Log[Cos[ArcSin[c*x]/2]] - 4*b*c^2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]
+ 4*b*c^2*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (8*I)*b*c^2*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])] + (8*I)*b*c^2*PolyLog[2, I*E^(I*ArcSin[c*x])] - (4*I)*b
*c^2*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(4*d^2)
```

Maple [A] (verified)

Time = 0.24 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.75

method	result
derivativedivides	$c^2\left(\frac{a\left(-\frac{1}{2c^2x^2}+2\ln(cx)-\frac{1}{4(cx-1)}-\ln(cx-1)+\frac{1}{4cx+4}-\ln(cx+1)\right)}{d^2}+\frac{b\left(-\frac{2c^2x^2\arcsin(cx)-cx\sqrt{-c^2x^2+1}-\arcsin(cx)}{2c^2x^2\left(c^2x^2-1\right)}+2\right.}{}\right.$
default	$c^2\left(\frac{a\left(-\frac{1}{2c^2x^2}+2\ln(cx)-\frac{1}{4(cx-1)}-\ln(cx-1)+\frac{1}{4cx+4}-\ln(cx+1)\right)}{d^2}+\frac{b\left(-\frac{2c^2x^2\arcsin(cx)-cx\sqrt{-c^2x^2+1}-\arcsin(cx)}{2c^2x^2\left(c^2x^2-1\right)}+2\right.}{}\right.$
parts	$\frac{a\left(-\frac{1}{2x^2}+2c^2\ln(x)-\frac{c^2}{4(cx-1)}-c^2\ln(cx-1)+\frac{c^2}{4cx+4}-c^2\ln(cx+1)\right)}{d^2}+\frac{bc^2\left(-\frac{2c^2x^2\arcsin(cx)-cx\sqrt{-c^2x^2+1}-\arcsin(cx)}{2c^2x^2\left(c^2x^2-1\right)}+\right.}{}$

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(a/d^2*(-1/2/c^2/x^2+2*ln(c*x)-1/4/(c*x-1)-ln(c*x-1)+1/4/(c*x+1)-ln(c*x
+1))+b/d^2*(-1/2*(2*c^2*x^2*arcsin(c*x)-c*x*(-c^2*x^2+1)^(1/2)-arcsin(c*x))
/c^2/x^2/(c^2*x^2-1)+2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*arcsin(
c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+
1)^(1/2))-2*I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+I*polylog(2,-(I*c*x+(-c^
2*x^2+1)^(1/2))^2)-2*I*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^2}\,dx=\int \frac{b\arcsin(cx)+a}{\left(c^2dx^2-d\right)^2x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x)
```

Sympy [F]

$$\int \frac{a + b \arcsin(cx)}{x^3 (d - c^2 d x^2)^2}\, dx = \frac{\int \frac{a}{c^4 x^7 - 2c^2 x^5 + x^3}\, dx + \int \frac{b \operatorname{asin}(cx)}{c^4 x^7 - 2c^2 x^5 + x^3}\, dx}{d^2}$$

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**2,x)
[Out] (Integral(a/(c**4*x**7 - 2*c**2*x**5 + x**3), x) + Integral(b*asin(c*x)/(c*
*4*x**7 - 2*c**2*x**5 + x**3), x))/d**2
```

Maxima [F]

$$\int \frac{a + b \arcsin(cx)}{x^3 (d - c^2 d x^2)^2}\, dx = \int \frac{b \arcsin(cx) + a}{(c^2 d x^2 - d)^2 x^3}\, dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
[Out] -1/2*a*(2*c^2*log(c*x + 1)/d^2 + 2*c^2*log(c*x - 1)/d^2 - 4*c^2*log(x)/d^2
+ (2*c^2*x^2 - 1)/(c^2*d^2*x^4 - d^2*x^2)) + b*integrate(arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x)
```

Giac [F]

$$\int \frac{a + b \arcsin(cx)}{x^3 (d - c^2 d x^2)^2}\, dx = \int \frac{b \arcsin(cx) + a}{(c^2 d x^2 - d)^2 x^3}\, dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^2*x^3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(cx)}{x^3 (d - c^2 d x^2)^2}\, dx = \int \frac{a + b \operatorname{asin}(c\,x)}{x^3 \left(d - c^2\,d\,x^2\right)^2}\, dx$$

```
[In] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^2),x)
[Out] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^2), x)
```

3.45 $\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 259

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^2}\,dx = & -\frac{bc^3}{3d^2\sqrt{1-c^2x^2}}-\frac{bc}{6d^2x^2\sqrt{1-c^2x^2}}-\frac{a+b\arcsin(cx)}{3d^2x^3\left(1-c^2x^2\right)} \\ & -\frac{5c^2(a+b\arcsin(cx))}{3d^2x\left(1-c^2x^2\right)}+\frac{5c^4x(a+b\arcsin(cx))}{2d^2\left(1-c^2x^2\right)} \\ & -\frac{5ic^3(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d^2} \\ & -\frac{13bc^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d^2}+\frac{5ibc^3\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{2d^2} \\ & -\frac{5ibc^3\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{2d^2}\end{aligned}$$

```
[Out] 1/3*(-a-b*arcsin(c*x))/d^2/x^3/(-c^2*x^2+1)-5/3*c^2*(a+b*arcsin(c*x))/d^2/x
/(-c^2*x^2+1)+5/2*c^4*x*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)-5*I*c^3*(a+b*arc
sin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d^2-13/6*b*c^3*arctanh((-c^2*x^2
+1)^(1/2))/d^2+5/2*I*b*c^3*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-5/2
*I*b*c^3*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-1/3*b*c^3/d^2/(-c^2*x^
2+1)^(1/2)-1/6*b*c/d^2/x^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {4789, 4747, 4749, 4266, 2317, 2438, 267, 272, 53, 65, 214, 44}

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)^2}\,dx = -\frac{5ic^3\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2} - \frac{5c^2(a+b\arcsin(cx))}{3d^2x(1-c^2x^2)} - \frac{a+b\arcsin(cx)}{3d^2x^3(1-c^2x^2)} + \frac{5c^4x(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} + \frac{5ibc^3\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{2d^2} - \frac{5ibc^3\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{2d^2} - \frac{13bc^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d^2} - \frac{bc}{6d^2x^2\sqrt{1-c^2x^2}} - \frac{bc^3}{3d^2\sqrt{1-c^2x^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/3*(b*c^3)/(d^2*Sqrt[1 - c^2*x^2]) - (b*c)/(6*d^2*x^2*Sqrt[1 - c^2*x^2])
- (a + b*ArcSin[c*x])/(3*d^2*x^3*(1 - c^2*x^2)) - (5*c^2*(a + b*ArcSin[c*x]
))/(3*d^2*x*(1 - c^2*x^2)) + (5*c^4*x*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*
x^2)) - ((5*I)*c^3*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (13
*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*d^2) + (((5*I)/2)*b*c^3*PolyLog[2, (-
I)*E^(I*ArcSin[c*x])])/d^2 - (((5*I)/2)*b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x]
)])/d^2
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 53

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
```

```
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
```

```
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx)}{3d^2x^3\left(1-c^2x^2\right)}+\frac{1}{3}\left(5c^2\right)\int\frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^2}\,dx+\frac{(bc)\int\frac{1}{x^3\left(1-c^2x^2\right)^{3/2}}\,dx}{3d^2}\\
&= -\frac{a+b\arcsin(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2(a+b\arcsin(cx))}{3d^2x\left(1-c^2x^2\right)}+\left(5c^4\right)\int\frac{a+b\arcsin(cx)}{\left(d-c^2dx^2\right)^2}\,dx\\
&\quad+\frac{(bc)\text{Subst}\left(\int\frac{1}{x^2\left(1-c^2x\right)^{3/2}}\,dx,x,x^2\right)}{6d^2}+\frac{\left(5bc^3\right)\int\frac{1}{x\left(1-c^2x^2\right)^{3/2}}\,dx}{3d^2}\\
&= -\frac{bc}{6d^2x^2\sqrt{1-c^2x^2}}-\frac{a+b\arcsin(cx)}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2(a+b\arcsin(cx))}{3d^2x\left(1-c^2x^2\right)}\\
&\quad+\frac{5c^4x(a+b\arcsin(cx))}{2d^2\left(1-c^2x^2\right)}+\frac{\left(bc^3\right)\text{Subst}\left(\int\frac{1}{x\left(1-c^2x\right)^{3/2}}\,dx,x,x^2\right)}{4d^2}\\
&\quad+\frac{\left(5bc^3\right)\text{Subst}\left(\int\frac{1}{x\left(1-c^2x\right)^{3/2}}\,dx,x,x^2\right)}{6d^2}\\
&\quad-\frac{\left(5bc^5\right)\int\frac{x}{\left(1-c^2x^2\right)^{3/2}}\,dx}{2d^2}+\frac{\left(5c^4\right)\int\frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx}{2d}
\end{aligned}
$$

$$= -\frac{bc^3}{3d^2\sqrt{1-c^2x^2}} - \frac{bc}{6d^2x^2\sqrt{1-c^2x^2}} - \frac{a+b\arcsin(cx)}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(a+b\arcsin(cx))}{3d^2x(1-c^2x^2)} + \frac{5c^4x(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} + \frac{(5c^3)\operatorname{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{2d^2} + \frac{(bc^3)\operatorname{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{4d^2} + \frac{(5bc^3)\operatorname{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{6d^2}$$

$$= -\frac{bc^3}{3d^2\sqrt{1-c^2x^2}} - \frac{bc}{6d^2x^2\sqrt{1-c^2x^2}} - \frac{a+b\arcsin(cx)}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(a+b\arcsin(cx))}{3d^2x(1-c^2x^2)} + \frac{5c^4x(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} - \frac{5ic^3(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d^2} - \frac{(bc)\operatorname{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{2d^2} - \frac{(5bc)\operatorname{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{3d^2} - \frac{(5bc^3)\operatorname{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{2d^2} + \frac{(5bc^3)\operatorname{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{2d^2}$$

$$= -\frac{bc^3}{3d^2\sqrt{1-c^2x^2}} - \frac{bc}{6d^2x^2\sqrt{1-c^2x^2}} - \frac{a+b\arcsin(cx)}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(a+b\arcsin(cx))}{3d^2x(1-c^2x^2)} + \frac{5c^4x(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} - \frac{5ic^3(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d^2} - \frac{13bc^3\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d^2} + \frac{(5ibc^3)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{2d^2} - \frac{(5ibc^3)\operatorname{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{2d^2}$$

$$= -\frac{bc^3}{3d^2\sqrt{1-c^2x^2}} - \frac{bc}{6d^2x^2\sqrt{1-c^2x^2}} - \frac{a+b\arcsin(cx)}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(a+b\arcsin(cx))}{3d^2x(1-c^2x^2)} + \frac{5c^4x(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} - \frac{5ic^3(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d^2} - \frac{13bc^3\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d^2} + \frac{5ibc^3\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{2d^2} - \frac{5ibc^3\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{2d^2}$$

Mathematica [A] (verified)

Time = 1.16 (sec) , antiderivative size = 426, normalized size of antiderivative = 1.64

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^2}\,dx =$$

$$-\frac{\frac{4a}{x^3}+\frac{24ac^2}{x}+\frac{2bc\sqrt{1-c^2x^2}}{x^2}-\frac{3bc^3\sqrt{1-c^2x^2}}{-1+cx}+\frac{3bc^3\sqrt{1-c^2x^2}}{1+cx}+\frac{6ac^4x}{-1+c^2x^2}+15ibc^3\pi\arcsin(cx)+\frac{4b\arcsin(cx)}{x^3}+\frac{24bc^2\arcs}{x}}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/12*((4*a)/x^3 + (24*a*c^2)/x + (2*b*c*Sqrt[1 - c^2*x^2])/x^2 - (3*b*c^3*
Sqrt[1 - c^2*x^2])/(-1 + c*x) + (3*b*c^3*Sqrt[1 - c^2*x^2])/(1 + c*x) + (6*
a*c^4*x)/(-1 + c^2*x^2) + (15*I)*b*c^3*Pi*ArcSin[c*x] + (4*b*ArcSin[c*x])/x
^3 + (24*b*c^2*ArcSin[c*x])/x + (3*b*c^3*ArcSin[c*x])/(-1 + c*x) + (3*b*c^3
*ArcSin[c*x])/(1 + c*x) + 26*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]] - 15*b*c^3*Pi
*Log[1 - I*E^(I*ArcSin[c*x])] - 30*b*c^3*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[
c*x])] - 15*b*c^3*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 30*b*c^3*ArcSin[c*x]*Lo
g[1 + I*E^(I*ArcSin[c*x])] + 15*a*c^3*Log[1 - c*x] - 15*a*c^3*Log[1 + c*x]
+ 15*b*c^3*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 15*b*c^3*Pi*Log[Sin[(Pi +
 2*ArcSin[c*x])/4]] - (30*I)*b*c^3*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (30
*I)*b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2
```

Maple [A] (verified)

Time = 0.31 (sec) , antiderivative size = 312, normalized size of antiderivative = 1.20

method	result
derivativedivides	$c^3\left(\frac{a\left(-\frac{1}{3c^3x^3}-\frac{2}{cx}-\frac{1}{4(cx-1)}-\frac{5\ln(cx-1)}{4}-\frac{1}{4(cx+1)}+\frac{5\ln(cx+1)}{4}\right)}{d^2}+\frac{b\left(-\frac{15c^4x^4\arcsin(cx)-2c^3x^3\sqrt{-c^2x^2+1}-10c^2x^2\arcsi}{6\left(c^2x^2-1\right)c^3x^3}\right.}{}\right.$
default	$c^3\left(\frac{a\left(-\frac{1}{3c^3x^3}-\frac{2}{cx}-\frac{1}{4(cx-1)}-\frac{5\ln(cx-1)}{4}-\frac{1}{4(cx+1)}+\frac{5\ln(cx+1)}{4}\right)}{d^2}+\frac{b\left(-\frac{15c^4x^4\arcsin(cx)-2c^3x^3\sqrt{-c^2x^2+1}-10c^2x^2\arcsi}{6\left(c^2x^2-1\right)c^3x^3}\right.}{}\right.$
parts	$\frac{a\left(-\frac{1}{3x^3}-\frac{2c^2}{x}-\frac{c^3}{4(cx-1)}-\frac{5c^3\ln(cx-1)}{4}-\frac{c^3}{4(cx+1)}+\frac{5c^3\ln(cx+1)}{4}\right)}{d^2}+\frac{b\,c^3\left(-\frac{15c^4x^4\arcsin(cx)-2c^3x^3\sqrt{-c^2x^2+1}-10c^2x^2\arcs}{6\left(c^2x^2-1\right)c^3x^3}\right.}{}$

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(a/d^2*(-1/3/c^3/x^3-2/c/x-1/4/(c*x-1)-5/4*ln(c*x-1)-1/4/(c*x+1)+5/4*ln
(c*x+1))+b/d^2*(-1/6*(15*c^4*x^4*arcsin(c*x)-2*c^3*x^3*(-c^2*x^2+1)^(1/2)-1
0*c^2*x^2*arcsin(c*x)-c*x*(-c^2*x^2+1)^(1/2)-2*arcsin(c*x))/(c^2*x^2-1)/c^3
/x^3+13/6*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-13/6*ln(1+I*c*x+(-c^2*x^2+1)^(1/2)
```

```
)-5/2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5/2*arcsin(c*x)*ln(1-I
*(I*c*x+(-c^2*x^2+1)^(1/2)))+5/2*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-5/
2*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^2}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^2x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)/(c^4*d^2*x^8 - 2*c^2*d^2*x^6 + d^2*x^4), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^2}\,dx=\frac{\int \frac{a}{c^4x^8-2c^2x^6+x^4}\,dx+\int \frac{b\operatorname{asin}\left(cx\right)}{c^4x^8-2c^2x^6+x^4}\,dx}{d^2}$$

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**2,x)
[Out] (Integral(a/(c**4*x**8 - 2*c**2*x**6 + x**4), x) + Integral(b*asin(c*x)/(c*
*4*x**8 - 2*c**2*x**6 + x**4), x))/d**2
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^2}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^2x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
[Out] 1/12*(15*c^3*log(c*x + 1)/d^2 - 15*c^3*log(c*x - 1)/d^2 - 2*(15*c^4*x^4 - 1
0*c^2*x^2 - 2)/(c^2*d^2*x^5 - d^2*x^3))*a + 1/12*(15*(c^5*x^5 - c^3*x^3)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 15*(c^5*x^5 - c^3*x
^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(15*c^4*x^
4 - 10*c^2*x^2 - 2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 12*(c^2*d^
2*x^5 - d^2*x^3)*integrate(-1/12*(30*c^5*x^4 - 20*c^3*x^2 - 15*(c^6*x^5 - c
^4*x^3)*log(c*x + 1) + 15*(c^6*x^5 - c^4*x^3)*log(-c*x + 1) - 4*c)*sqrt(c*x
 + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x))*b/(c^2*d^
2*x^5 - d^2*x^3)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^2}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^2x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^2*x^4), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^2}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^4\left(d-c^2\,d\,x^2\right)^2}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^2),x)
[Out] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^2), x)
```

3.46 $\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 204

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = -\frac{b}{12c^5d^3(1-c^2x^2)^{3/2}}+\frac{5b}{8c^5d^3\sqrt{1-c^2x^2}}+\frac{x^3(a+b\arcsin(cx))}{4c^2d^3(1-c^2x^2)^2} -\frac{3x(a+b\arcsin(cx))}{8c^4d^3(1-c^2x^2)}-\frac{3i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4c^5d^3} +\frac{3ib\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8c^5d^3}-\frac{3ib\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8c^5d^3}$$

```
[Out] -1/12*b/c^5/d^3/(-c^2*x^2+1)^(3/2)+1/4*x^3*(a+b*arcsin(c*x))/c^2/d^3/(-c^2*
x^2+1)^2-3/8*x*(a+b*arcsin(c*x))/c^4/d^3/(-c^2*x^2+1)-3/4*I*(a+b*arcsin(c*x
))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c^5/d^3+3/8*I*b*polylog(2,-I*(I*c*x+(-c
^2*x^2+1)^(1/2)))/c^5/d^3-3/8*I*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c
^5/d^3+5/8*b/c^5/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 204, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {4791, 4749, 4266, 2317, 2438, 267, 272, 45}

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = -\frac{3i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4c^5d^3} + \frac{x^3(a+b\arcsin(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\arcsin(cx))}{8c^4d^3(1-c^2x^2)} + \frac{3ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8c^5d^3} - \frac{3ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8c^5d^3} + \frac{5b}{8c^5d^3\sqrt{1-c^2x^2}} - \frac{b}{12c^5d^3(1-c^2x^2)^{3/2}}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/12*b/(c^5*d^3*(1 - c^2*x^2)^(3/2)) + (5*b)/(8*c^5*d^3*Sqrt[1 - c^2*x^2])
 + (x^3*(a + b*ArcSin[c*x]))/(4*c^2*d^3*(1 - c^2*x^2)^2) - (3*x*(a + b*ArcS
in[c*x]))/(8*c^4*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])*ArcTan
[E^(I*ArcSin[c*x])])/(c^5*d^3) + (((3*I)/8)*b*PolyLog[2, (-I)*E^(I*ArcSin[c
*x])])/(c^5*d^3) - (((3*I)/8)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5*d^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{x^3(a+b\arcsin(cx))}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{b\int\frac{x^3}{(1-c^2x^2)^{5/2}}\,dx}{4cd^3}-\frac{3\int\frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx}{4c^2d}\\ &= \frac{x^3(a+b\arcsin(cx))}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{3x(a+b\arcsin(cx))}{8c^4d^3\left(1-c^2x^2\right)}+\frac{(3b)\int\frac{x}{(1-c^2x^2)^{3/2}}\,dx}{8c^3d^3}\\ &\quad-\frac{b\text{Subst}\left(\int\frac{x}{(1-c^2x)^{5/2}}\,dx,x,x^2\right)}{8cd^3}+\frac{3\int\frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx}{8c^4d^2}\end{aligned}$$

$$= \frac{3b}{8c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\arcsin(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\arcsin(cx))}{8c^4d^3(1-c^2x^2)} + \frac{3\text{Subst}(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx))}{8c^5d^3} - \frac{b\text{Subst}\left(\int\left(\frac{1}{c^2(1-c^2x)^{5/2}}-\frac{1}{c^2(1-c^2x)^{3/2}}\right)\,dx,x,x^2\right)}{8cd^3}$$

$$= -\frac{b}{12c^5d^3(1-c^2x^2)^{3/2}} + \frac{5b}{8c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\arcsin(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\arcsin(cx))}{8c^4d^3(1-c^2x^2)} - \frac{3i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4c^5d^3} - \frac{(3b)\text{Subst}(\int\log(1-ie^{ix})\,dx,x,\arcsin(cx))}{8c^5d^3} + \frac{(3b)\text{Subst}(\int\log(1+ie^{ix})\,dx,x,\arcsin(cx))}{8c^5d^3}$$

$$= -\frac{b}{12c^5d^3(1-c^2x^2)^{3/2}} + \frac{5b}{8c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\arcsin(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\arcsin(cx))}{8c^4d^3(1-c^2x^2)} - \frac{3i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4c^5d^3} + \frac{(3ib)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{8c^5d^3} - \frac{(3ib)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{8c^5d^3}$$

$$= -\frac{b}{12c^5d^3(1-c^2x^2)^{3/2}} + \frac{5b}{8c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\arcsin(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\arcsin(cx))}{8c^4d^3(1-c^2x^2)} - \frac{3i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4c^5d^3} + \frac{3ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8c^5d^3} - \frac{3ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8c^5d^3}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 445 vs. $2(204) = 408$.

Time = 0.84 (sec) , antiderivative size = 445, normalized size of antiderivative = 2.18

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx$$

$$= \frac{-\frac{2b\sqrt{1-c^2x^2}}{(-1+cx)^2} + \frac{bcx\sqrt{1-c^2x^2}}{(-1+cx)^2} - \frac{15b\sqrt{1-c^2x^2}}{-1+cx} - \frac{2b\sqrt{1-c^2x^2}}{(1+cx)^2} - \frac{bcx\sqrt{1-c^2x^2}}{(1+cx)^2} + \frac{15b\sqrt{1-c^2x^2}}{1+cx} + \frac{12acx}{(-1+c^2x^2)^2} + \frac{30acx}{-1+c^2x^2} - 9ib\pi\text{ ar}}{}$$

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((-2*b*Sqrt[1 - c^2*x^2])/(-1 + c*x)^2 + (b*c*x*Sqrt[1 - c^2*x^2])/(-1 + c*
x)^2 - (15*b*Sqrt[1 - c^2*x^2])/(-1 + c*x) - (2*b*Sqrt[1 - c^2*x^2])/(1 + c
*x)^2 - (b*c*x*Sqrt[1 - c^2*x^2])/(1 + c*x)^2 + (15*b*Sqrt[1 - c^2*x^2])/(1
 + c*x) + (12*a*c*x)/(-1 + c^2*x^2)^2 + (30*a*c*x)/(-1 + c^2*x^2) - (9*I)*b
*Pi*ArcSin[c*x] + (3*b*ArcSin[c*x])/(-1 + c*x)^2 + (15*b*ArcSin[c*x])/(-1 +
 c*x) - (3*b*ArcSin[c*x])/(1 + c*x)^2 + (15*b*ArcSin[c*x])/(1 + c*x) + 9*b*
Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 18*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*
x])] + 9*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] - 18*b*ArcSin[c*x]*Log[1 + I*E^(
I*ArcSin[c*x])] - 9*a*Log[1 - c*x] + 9*a*Log[1 + c*x] - 9*b*Pi*Log[-Cos[(Pi
 + 2*ArcSin[c*x])/4]] - 9*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (18*I)*b*
PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (18*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x]
)])/(48*c^5*d^3)
```

Maple [A] (verified)

Time = 0.24 (sec) , antiderivative size = 262, normalized size of antiderivative = 1.28

method	result
derivativedivides	$-\frac{\frac{a\left(-\frac{1}{16(cx-1)^2}-\frac{5}{16(cx-1)}+\frac{3\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}-\frac{5}{16(cx+1)}-\frac{3\ln(cx+1)}{16}\right)}{d^3}-\frac{b\left(-\frac{15c^3x^3\arcsin(cx)-15c^2x^2\sqrt{-c^2x^2+1}-9c\cdots}{24\left(c^4x^4-2c^2x^2+\cdots\right.}\cdots\right.}{\cdots}}{\cdots}$
default	$-\frac{\frac{a\left(-\frac{1}{16(cx-1)^2}-\frac{5}{16(cx-1)}+\frac{3\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}-\frac{5}{16(cx+1)}-\frac{3\ln(cx+1)}{16}\right)}{d^3}-\frac{b\left(-\frac{15c^3x^3\arcsin(cx)-15c^2x^2\sqrt{-c^2x^2+1}-9c\cdots}{24\left(c^4x^4-2c^2x^2+\cdots\right.}\cdots\right.}{\cdots}}{\cdots}$
parts	$-\frac{a\left(-\frac{1}{16c^5(cx-1)^2}-\frac{5}{16c^5(cx-1)}+\frac{3\ln(cx-1)}{16c^5}+\frac{1}{16c^5(cx+1)^2}-\frac{5}{16c^5(cx+1)}-\frac{3\ln(cx+1)}{16c^5}\right)}{d^3}-\frac{b\left(-\frac{15c^3x^3\arcsin(cx)-15c^2x^2\sqrt{\cdots}}{24(\cdots}\cdots\right.}{\cdots}$

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(-a/d^3*(-1/16/(c*x-1)^2-5/16/(c*x-1)+3/16*ln(c*x-1)+1/16/(c*x+1)^2-5
/16/(c*x+1)-3/16*ln(c*x+1))-b/d^3*(-1/24*(15*c^3*x^3*arcsin(c*x)-15*c^2*x^2
*(-c^2*x^2+1)^(1/2)-9*c*x*arcsin(c*x)+13*(-c^2*x^2+1)^(1/2))/(c^4*x^4-2*c^2
*x^2+1)+3/8*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/8*arcsin(c*x)*
ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/8*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2
)))+3/8*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)x^4}{(c^2dx^2-d)^3}\,dx$$

[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")

[Out] integral(-(b*x^4*arcsin(c*x) + a*x^4)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = -\frac{\int \frac{ax^4}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{bx^4\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)

[Out] -(Integral(a*x**4/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integral(b*x**4*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d**3

Maxima [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)x^4}{(c^2dx^2-d)^3}\,dx$$

[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")

[Out] 1/16*a*(2*(5*c^2*x^3 - 3*x)/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3) + 3*log(c*x + 1)/(c^5*d^3) - 3*log(c*x - 1)/(c^5*d^3)) + 1/16*(3*(c^4*x^4 - 2*c^2*x^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 3*(c^4*x^4 - 2*c^2*x^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 2*(5*c^3*x^3 - 3*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 16*(c^9*d^3*x^4 - 2*c^7*d^3*x^2 + c^5*d^3)*integrate(1/16*(10*c^3*x^3 - 6*c*x + 3*(c^4*x^4 - 2*c^2*x^2 + 1)*log(c*x + 1) - 3*(c^4*x^4 - 2*c^2*x^2 + 1)*log(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^10*d^3*x^6 - 3*c^8*d^3*x^4 + 3*c^6*d^3*x^2 - c^4*d^3), x))*b/(c^9*d^3*x^4 - 2*c^7*d^3*x^2 + c^5*d^3)

Giac [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)x^4}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)*x^4/(c^2*d*x^2 - d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \int \frac{x^4\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^3}\,dx$$

```
[In] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3,x)
[Out] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3, x)
```

3.47 $\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 100

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = -\frac{bx^3}{12cd^3(1-c^2x^2)^{3/2}} + \frac{bx}{4c^3d^3\sqrt{1-c^2x^2}} - \frac{b\arcsin(cx)}{4c^4d^3} + \frac{x^4(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2}$$

```
[Out] -1/12*b*x^3/c/d^3/(-c^2*x^2+1)^(3/2)-1/4*b*arcsin(c*x)/c^4/d^3+1/4*x^4*(a+b
*arcsin(c*x))/d^3/(-c^2*x^2+1)^2+1/4*b*x/c^3/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4771, 294, 222}

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \frac{x^4(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} - \frac{b\arcsin(cx)}{4c^4d^3} - \frac{bx^3}{12cd^3(1-c^2x^2)^{3/2}} + \frac{bx}{4c^3d^3\sqrt{1-c^2x^2}}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/12*(b*x^3)/(c*d^3*(1 - c^2*x^2)^(3/2)) + (b*x)/(4*c^3*d^3*Sqrt[1 - c^2*x
^2]) - (b*ArcSin[c*x])/(4*c^4*d^3) + (x^4*(a + b*ArcSin[c*x]))/(4*d^3*(1 -
c^2*x^2)^2)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 294

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(
n - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*n*(p + 1))), x] - Dist[c^n
*((m - n + 1)/(b*n*(p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{x^4(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2}-\frac{(bc)\int\frac{x^4}{(1-c^2x^2)^{5/2}}\,dx}{4d^3}\\ &= -\frac{bx^3}{12cd^3(1-c^2x^2)^{3/2}}+\frac{x^4(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2}+\frac{b\int\frac{x^2}{(1-c^2x^2)^{3/2}}\,dx}{4cd^3}\\ &= -\frac{bx^3}{12cd^3(1-c^2x^2)^{3/2}}+\frac{bx}{4c^3d^3\sqrt{1-c^2x^2}}+\frac{x^4(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2}-\frac{b\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{4c^3d^3}\\ &= -\frac{bx^3}{12cd^3(1-c^2x^2)^{3/2}}+\frac{bx}{4c^3d^3\sqrt{1-c^2x^2}}-\frac{b\arcsin(cx)}{4c^4d^3}+\frac{x^4(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.79

$$\int\frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \frac{bcx(3-4c^2x^2)\sqrt{1-c^2x^2}+a(-3+6c^2x^2)+3b(-1+2c^2x^2)\arcsin(cx)}{12c^4d^3(-1+c^2x^2)^2}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
[Out] (b*c*x*(3 - 4*c^2*x^2)*Sqrt[1 - c^2*x^2] + a*(-3 + 6*c^2*x^2) + 3*b*(-1 + 2
*c^2*x^2)*ArcSin[c*x])/(12*c^4*d^3*(-1 + c^2*x^2)^2)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 211 vs. $2(88) = 176$.

Time = 0.11 (sec) , antiderivative size = 212, normalized size of antiderivative = 2.12

method	result
derivativedivides	$-\frac{\frac{a\left(-\frac{1}{16(cx-1)^2}-\frac{3}{16(cx-1)}-\frac{1}{16(cx+1)^2}+\frac{3}{16(cx+1)}\right)}{d^3}-\frac{b\left(-\frac{\arcsin(cx)}{16(cx-1)^2}-\frac{3\arcsin(cx)}{16(cx-1)}-\frac{\arcsin(cx)}{16(cx+1)^2}+\frac{3\arcsin(cx)}{16(cx+1)}-\frac{\sqrt{-(cx+1)^2+2c\ldots}}{48(cx+1)^2}\ldots\right)}{d^3}}{c^4}$
default	$-\frac{\frac{a\left(-\frac{1}{16(cx-1)^2}-\frac{3}{16(cx-1)}-\frac{1}{16(cx+1)^2}+\frac{3}{16(cx+1)}\right)}{d^3}-\frac{b\left(-\frac{\arcsin(cx)}{16(cx-1)^2}-\frac{3\arcsin(cx)}{16(cx-1)}-\frac{\arcsin(cx)}{16(cx+1)^2}+\frac{3\arcsin(cx)}{16(cx+1)}-\frac{\sqrt{-(cx+1)^2+2c\ldots}}{48(cx+1)^2}\ldots\right)}{d^3}}{c^4}$
parts	$-\frac{a\left(-\frac{1}{16c^4(cx-1)^2}-\frac{3}{16c^4(cx-1)}-\frac{1}{16c^4(cx+1)^2}+\frac{3}{16c^4(cx+1)}\right)}{d^3}-\frac{b\left(-\frac{\arcsin(cx)}{16(cx-1)^2}-\frac{3\arcsin(cx)}{16(cx-1)}-\frac{\arcsin(cx)}{16(cx+1)^2}+\frac{3\arcsin(cx)}{16(cx+1)}-\ldots\right)}{\ldots}$

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(-a/d^3*(-1/16/(c*x-1)^2-3/16/(c*x-1)-1/16/(c*x+1)^2+3/16/(c*x+1))-b/
d^3*(-1/16*arcsin(c*x)/(c*x-1)^2-3/16*arcsin(c*x)/(c*x-1)-1/16*arcsin(c*x)/
(c*x+1)^2+3/16*arcsin(c*x)/(c*x+1)-1/48/(c*x+1)^2*(-(c*x+1)^2+2*c*x+2)^(1/2
)+1/6/(c*x+1)*(-(c*x+1)^2+2*c*x+2)^(1/2)+1/6/(c*x-1)*(-(c*x-1)^2-2*c*x+2)^(
1/2)+1/48/(c*x-1)^2*(-(c*x-1)^2-2*c*x+2)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 91, normalized size of antiderivative = 0.91

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \frac{3\,ac^4x^4+3\left(2\,bc^2x^2-b\right)\arcsin\left(cx\right)-\left(4\,bc^3x^3-3\,bcx\right)\sqrt{-c^2x^2+1}}{12\left(c^8d^3x^4-2\,c^6d^3x^2+c^4d^3\right)}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] 1/12*(3*a*c^4*x^4 + 3*(2*b*c^2*x^2 - b)*arcsin(c*x) - (4*b*c^3*x^3 - 3*b*c*
x)*sqrt(-c^2*x^2 + 1))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3)
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = -\frac{\int \frac{ax^3}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{bx^3\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a*x**3/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integra
l(b*x**3*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d**3
```

Maxima [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)x^3}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(2*c^2*x^2 - 1)*a/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3) + 1/4*((2*c^2
*x^2 - 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 4*(c^8*d^3*x^4 - 2*c
^6*d^3*x^2 + c^4*d^3)*integrate(1/4*(2*c^2*x^2 - 1)*e^(1/2*log(c*x + 1) + 1
/2*log(-c*x + 1))/(c^11*d^3*x^8 - 3*c^9*d^3*x^6 + 3*c^7*d^3*x^4 - c^5*d^3*x
^2 + (c^9*d^3*x^6 - 3*c^7*d^3*x^4 + 3*c^5*d^3*x^2 - c^3*d^3)*e^(log(c*x + 1
) + log(-c*x + 1))), x))*b/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.24

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \frac{bx^4\arcsin(cx)}{4(c^2x^2-1)^2d^3} + \frac{ax^4}{4(c^2x^2-1)^2d^3} + \frac{bx^3}{12(c^2x^2-1)\sqrt{-c^2x^2+1}cd^3} + \frac{bx}{4\sqrt{-c^2x^2+1}c^3d^3} - \frac{b\arcsin(cx)}{4c^4d^3} - \frac{a}{4c^4d^3}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] 1/4*b*x^4*arcsin(c*x)/((c^2*x^2 - 1)^2*d^3) + 1/4*a*x^4/((c^2*x^2 - 1)^2*d^
3) + 1/12*b*x^3/((c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*c*d^3) + 1/4*b*x/(sqrt(-c
^2*x^2 + 1)*c^3*d^3) - 1/4*b*arcsin(c*x)/(c^4*d^3) - 1/4*a/(c^4*d^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \int \frac{x^3\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^3}\,dx$$

```
[In] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3,x)
[Out] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3, x)
```

3.48 $\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^3} dx$

Optimal result

Integrand size = 25, antiderivative size = 202

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^3} dx = -\frac{b}{12c^3d^3(1-c^2x^2)^{3/2}} + \frac{b}{8c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{x(a+b\arcsin(cx))}{8c^2d^3(1-c^2x^2)} + \frac{i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4c^3d^3} - \frac{ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8c^3d^3} + \frac{ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8c^3d^3}$$

```
[Out] -1/12*b/c^3/d^3/(-c^2*x^2+1)^(3/2)+1/4*x*(a+b*arcsin(c*x))/c^2/d^3/(-c^2*x^
2+1)^2-1/8*x*(a+b*arcsin(c*x))/c^2/d^3/(-c^2*x^2+1)+1/4*I*(a+b*arcsin(c*x))
*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c^3/d^3-1/8*I*b*polylog(2,-I*(I*c*x+(-c^2
*x^2+1)^(1/2)))/c^3/d^3+1/8*I*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3
/d^3+1/8*b/c^3/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {4791, 4747, 4749, 4266, 2317, 2438, 267}

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \frac{i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4c^3d^3} - \frac{x(a+b\arcsin(cx))}{8c^2d^3(1-c^2x^2)} + \frac{x(a+b\arcsin(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8c^3d^3} + \frac{ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8c^3d^3} + \frac{b}{8c^3d^3\sqrt{1-c^2x^2}} - \frac{b}{12c^3d^3(1-c^2x^2)^{3/2}}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/12*b/(c^3*d^3*(1 - c^2*x^2)^(3/2)) + b/(8*c^3*d^3*Sqrt[1 - c^2*x^2]) + (
x*(a + b*ArcSin[c*x]))/(4*c^2*d^3*(1 - c^2*x^2)^2) - (x*(a + b*ArcSin[c*x])
)/(8*c^2*d^3*(1 - c^2*x^2)) + ((I/4)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin
[c*x])])/(c^3*d^3) - ((I/8)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^3)
 + ((I/8)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^3*d^3)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
```

```
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\text{integral} = \frac{x(a+b\arcsin(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{b\int \frac{x}{(1-c^2x^2)^{5/2}}\,dx}{4cd^3} - \frac{\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^2}\,dx}{4c^2d}$$

$$= -\frac{b}{12c^3d^3(1-c^2x^2)^{3/2}} + \frac{x(a+b\arcsin(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{x(a+b\arcsin(cx))}{8c^2d^3(1-c^2x^2)} + \frac{b\int \frac{x}{(1-c^2x^2)^{3/2}}\,dx}{8cd^3} - \frac{\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx}{8c^2d^2}$$

$$= -\frac{b}{12c^3d^3(1-c^2x^2)^{3/2}} + \frac{b}{8c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{4c^2d^3(1-c^2x^2)^2} - \frac{x(a+b\arcsin(cx))}{8c^2d^3(1-c^2x^2)} - \frac{\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{8c^3d^3}$$

$$= -\frac{b}{12c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b}{8c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x(a+b\arcsin(cx))}{8c^2d^3\left(1-c^2x^2\right)} + \frac{i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4c^3d^3} + \frac{b\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{8c^3d^3} - \frac{b\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{8c^3d^3}$$

$$= -\frac{b}{12c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b}{8c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x(a+b\arcsin(cx))}{8c^2d^3\left(1-c^2x^2\right)} + \frac{i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4c^3d^3} - \frac{(ib)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{8c^3d^3} + \frac{(ib)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{8c^3d^3}$$

$$= -\frac{b}{12c^3d^3\left(1-c^2x^2\right)^{3/2}} + \frac{b}{8c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{x(a+b\arcsin(cx))}{8c^2d^3\left(1-c^2x^2\right)} + \frac{i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4c^3d^3} - \frac{ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8c^3d^3} + \frac{ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8c^3d^3}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 445 vs. 2(202) = 404.

Time = 0.90 (sec) , antiderivative size = 445, normalized size of antiderivative = 2.20

$$\int\frac{x^2(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^3}\,dx$$

$$= \frac{-\frac{2b\sqrt{1-c^2x^2}}{(-1+cx)^2} + \frac{bcx\sqrt{1-c^2x^2}}{(-1+cx)^2} - \frac{3b\sqrt{1-c^2x^2}}{-1+cx} - \frac{2b\sqrt{1-c^2x^2}}{(1+cx)^2} - \frac{bcx\sqrt{1-c^2x^2}}{(1+cx)^2} + \frac{3b\sqrt{1-c^2x^2}}{1+cx} + \frac{12acx}{(-1+c^2x^2)^2} + \frac{6acx}{-1+c^2x^2} + 3ib\pi\,\text{arcs}}{}$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((-2*b*Sqrt[1 - c^2*x^2])/(-1 + c*x)^2 + (b*c*x*Sqrt[1 - c^2*x^2])/(-1 + c*
x)^2 - (3*b*Sqrt[1 - c^2*x^2])/(-1 + c*x) - (2*b*Sqrt[1 - c^2*x^2])/(1 + c*
x)^2 - (b*c*x*Sqrt[1 - c^2*x^2])/(1 + c*x)^2 + (3*b*Sqrt[1 - c^2*x^2])/(1 +
 c*x) + (12*a*c*x)/(-1 + c^2*x^2)^2 + (6*a*c*x)/(-1 + c^2*x^2) + (3*I)*b*Pi
*ArcSin[c*x] + (3*b*ArcSin[c*x])/(-1 + c*x)^2 + (3*b*ArcSin[c*x])/(-1 + c*x
) - (3*b*ArcSin[c*x])/(1 + c*x)^2 + (3*b*ArcSin[c*x])/(1 + c*x) - 3*b*Pi*Lo
g[1 - I*E^(I*ArcSin[c*x])] - 6*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] -
```

```
3*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 6*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSi
n[c*x])] + 3*a*Log[1 - c*x] - 3*a*Log[1 + c*x] + 3*b*Pi*Log[-Cos[(Pi + 2*Ar
cSin[c*x])/4]] + 3*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (6*I)*b*PolyLog[
2, (-I)*E^(I*ArcSin[c*x])] + (6*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(48*c
^3*d^3)
```

Maple [A] (verified)

Time = 0.22 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.29

method	result
derivativedivides	$-\frac{a\left(-\frac{1}{16(cx-1)^2}-\frac{1}{16(cx-1)}-\frac{\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}-\frac{1}{16(cx+1)}+\frac{\ln(cx+1)}{16}\right)}{d^3}-\frac{b\left(-\frac{3c^3x^3\arcsin(cx)-3c^2x^2\sqrt{-c^2x^2+1}+3cx\,\mathrm{arcs}}{24\left(c^4x^4-2c^2x^2+1\right)}\right.}{}$
default	$-\frac{a\left(-\frac{1}{16(cx-1)^2}-\frac{1}{16(cx-1)}-\frac{\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}-\frac{1}{16(cx+1)}+\frac{\ln(cx+1)}{16}\right)}{d^3}-\frac{b\left(-\frac{3c^3x^3\arcsin(cx)-3c^2x^2\sqrt{-c^2x^2+1}+3cx\,\mathrm{arcs}}{24\left(c^4x^4-2c^2x^2+1\right)}\right.}{}$
parts	$-\frac{a\left(-\frac{1}{16c^3(cx-1)^2}-\frac{1}{16c^3(cx-1)}-\frac{\ln(cx-1)}{16c^3}+\frac{1}{16c^3(cx+1)^2}-\frac{1}{16c^3(cx+1)}+\frac{\ln(cx+1)}{16c^3}\right)}{d^3}-\frac{b\left(-\frac{3c^3x^3\arcsin(cx)-3c^2x^2\sqrt{-c^2}}{24\left(c^4x^4\right.}\right.}{}$

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(-a/d^3*(-1/16/(c*x-1)^2-1/16/(c*x-1)-1/16*ln(c*x-1)+1/16/(c*x+1)^2-1
/16/(c*x+1)+1/16*ln(c*x+1))-b/d^3*(-1/24*(3*c^3*x^3*arcsin(c*x)-3*c^2*x^2*(
-c^2*x^2+1)^(1/2)+3*c*x*arcsin(c*x)+(-c^2*x^2+1)^(1/2))/(c^4*x^4-2*c^2*x^2+
1)-1/8*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/8*arcsin(c*x)*ln(1-
I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/8*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1
/8*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^3}\,dx=\int -\frac{(b\arcsin{(cx)}+a)x^2}{\left(c^2dx^2-d\right)^3}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*x^2*arcsin(c*x) + a*x^2)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*
d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = -\frac{\int \frac{ax^2}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{bx^2\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a*x**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integra
l(b*x**2*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d**3
```

Maxima [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)x^2}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/16*a*(2*(c^2*x^3 + x)/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3) - log(c*x +
 1)/(c^3*d^3) + log(c*x - 1)/(c^3*d^3)) - 1/16*((c^4*x^4 - 2*c^2*x^2 + 1)*a
rctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - (c^4*x^4 - 2*c^2*x
^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(c^3*x
^3 + c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 16*(c^7*d^3*x^4 - 2*
c^5*d^3*x^2 + c^3*d^3)*integrate(-1/16*(2*c^3*x^3 + 2*c*x - (c^4*x^4 - 2*c^
2*x^2 + 1)*log(c*x + 1) + (c^4*x^4 - 2*c^2*x^2 + 1)*log(-c*x + 1))*sqrt(c*x
 + 1)*sqrt(-c*x + 1)/(c^8*d^3*x^6 - 3*c^6*d^3*x^4 + 3*c^4*d^3*x^2 - c^2*d^3
), x))*b/(c^7*d^3*x^4 - 2*c^5*d^3*x^2 + c^3*d^3)
```

Giac [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)x^2}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)*x^2/(c^2*d*x^2 - d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx=\int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^3}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3,x)
[Out] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3, x)
```

3.49 $\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 83

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = -\frac{bx}{12cd^3(1-c^2x^2)^{3/2}} - \frac{bx}{6cd^3\sqrt{1-c^2x^2}} + \frac{a+b\arcsin(cx)}{4c^2d^3(1-c^2x^2)^2}$$

```
[Out] -1/12*b*x/c/d^3/(-c^2*x^2+1)^(3/2)+1/4*(a+b*arcsin(c*x))/c^2/d^3/(-c^2*x^2+
1)^2-1/6*b*x/c/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {4767, 198, 197}

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \frac{a+b\arcsin(cx)}{4c^2d^3(1-c^2x^2)^2} - \frac{bx}{6cd^3\sqrt{1-c^2x^2}} - \frac{bx}{12cd^3(1-c^2x^2)^{3/2}}$$

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/12*(b*x)/(c*d^3*(1 - c^2*x^2)^(3/2)) - (b*x)/(6*c*d^3*Sqrt[1 - c^2*x^2])
 + (a + b*ArcSin[c*x])/(4*c^2*d^3*(1 - c^2*x^2)^2)
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a+b\arcsin(cx)}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{b\int\frac{1}{\left(1-c^2x^2\right)^{5/2}}\,dx}{4cd^3}\\
&= -\frac{bx}{12cd^3\left(1-c^2x^2\right)^{3/2}}+\frac{a+b\arcsin(cx)}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{b\int\frac{1}{\left(1-c^2x^2\right)^{3/2}}\,dx}{6cd^3}\\
&= -\frac{bx}{12cd^3\left(1-c^2x^2\right)^{3/2}}-\frac{bx}{6cd^3\sqrt{1-c^2x^2}}+\frac{a+b\arcsin(cx)}{4c^2d^3\left(1-c^2x^2\right)^2}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.75

$$\int\frac{x(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^3}\,dx=\frac{\frac{bcx\left(-3+2c^2x^2\right)}{3\left(1-c^2x^2\right)^{3/2}}+\frac{a+b\arcsin(cx)}{\left(-1+c^2x^2\right)^2}}{4c^2d^3}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
[Out] ((b*c*x*(-3 + 2*c^2*x^2))/(3*(1 - c^2*x^2)^(3/2)) + (a + b*ArcSin[c*x])/(-1
 + c^2*x^2)^2)/(4*c^2*d^3)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 150 vs. $2(73) = 146$.

Time = 0.06 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.82

method	result
derivativedivides	$\frac{\frac{a}{4d^3\left(c^2x^2-1\right)^2}-\frac{b\left(-\frac{\arcsin(cx)}{4\left(c^2x^2-1\right)^2}-\frac{\sqrt{-(cx+1)^2+2cx+2}}{48(cx+1)^2}-\frac{\sqrt{-(cx+1)^2+2cx+2}}{12(cx+1)}-\frac{\sqrt{-(cx-1)^2-2cx+2}}{12(cx-1)}+\frac{\sqrt{-(cx-1)^2-2cx+2}}{48(cx-1)^2}\right)}{d^3}}{c^2}$
default	$\frac{\frac{a}{4d^3\left(c^2x^2-1\right)^2}-\frac{b\left(-\frac{\arcsin(cx)}{4\left(c^2x^2-1\right)^2}-\frac{\sqrt{-(cx+1)^2+2cx+2}}{48(cx+1)^2}-\frac{\sqrt{-(cx+1)^2+2cx+2}}{12(cx+1)}-\frac{\sqrt{-(cx-1)^2-2cx+2}}{12(cx-1)}+\frac{\sqrt{-(cx-1)^2-2cx+2}}{48(cx-1)^2}\right)}{d^3}}{c^2}$
parts	$\frac{a}{4d^3c^2(c^2x^2-1)^2}-\frac{b\left(-\frac{\arcsin(cx)}{4\left(c^2x^2-1\right)^2}-\frac{\sqrt{-(cx+1)^2+2cx+2}}{48(cx+1)^2}-\frac{\sqrt{-(cx+1)^2+2cx+2}}{12(cx+1)}-\frac{\sqrt{-(cx-1)^2-2cx+2}}{12(cx-1)}+\frac{\sqrt{-(cx-1)^2-2cx+2}}{48(cx-1)^2}\right.}{d^3c^2}$

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(1/4*a/d^3/(c^2*x^2-1)^2-b/d^3*(-1/4/(c^2*x^2-1)^2*arcsin(c*x)-1/48/(
c*x+1)^2*(-(c*x+1)^2+2*c*x+2)^(1/2)-1/12/(c*x+1)*(-(c*x+1)^2+2*c*x+2)^(1/2)
-1/12/(c*x-1)*(-(c*x-1)^2-2*c*x+2)^(1/2)+1/48/(c*x-1)^2*(-(c*x-1)^2-2*c*x+2
)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.06

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = -\frac{3\,ac^4x^4-6\,ac^2x^2-3\,b\arcsin\left(cx\right)-\left(2\,bc^3x^3-3\,bcx\right)\sqrt{-c^2x^2+1}}{12\left(c^6d^3x^4-2\,c^4d^3x^2+c^2d^3\right)}$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] -1/12*(3*a*c^4*x^4 - 6*a*c^2*x^2 - 3*b*arcsin(c*x) - (2*b*c^3*x^3 - 3*b*c*x
)*sqrt(-c^2*x^2 + 1))/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^3}\,dx = -\frac{\int \frac{ax}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{bx\,\mathrm{asin}\,(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
[Out] -(Integral(a*x/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integral(b
*x*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d**3
```

Maxima [F]

$$\int \frac{x(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)x}{\left(c^2dx^2-d\right)^3}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
[Out] 1/4*(4*(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)*integrate(1/4*e^(1/2*log(c*x
 + 1) + 1/2*log(-c*x + 1))/(c^9*d^3*x^8 - 3*c^7*d^3*x^6 + 3*c^5*d^3*x^4 - c
^3*d^3*x^2 + (c^7*d^3*x^6 - 3*c^5*d^3*x^4 + 3*c^3*d^3*x^2 - c*d^3)*e^(log(c
*x + 1) + log(-c*x + 1))), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
*b/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3) + 1/4*a/(c^6*d^3*x^4 - 2*c^4*d^3
*x^2 + c^2*d^3)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 172 vs. $2(72) = 144$.

Time = 0.30 (sec) , antiderivative size = 172, normalized size of antiderivative = 2.07

$$\int \frac{x(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^3}\,dx = \frac{bc^2x^4\arcsin(cx)}{4\left(c^2x^2-1\right)^2d^3} + \frac{ac^2x^4}{4\left(c^2x^2-1\right)^2d^3} + \frac{bcx^3}{12\left(c^2x^2-1\right)\sqrt{-c^2x^2+1}d^3} - \frac{bx^2\arcsin(cx)}{2\left(c^2x^2-1\right)d^3} - \frac{ax^2}{2\left(c^2x^2-1\right)d^3} - \frac{bx}{4\sqrt{-c^2x^2+1}cd^3} + \frac{b\arcsin(cx)}{4c^2d^3} + \frac{a}{4c^2d^3}$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
[Out] 1/4*b*c^2*x^4*arcsin(c*x)/((c^2*x^2 - 1)^2*d^3) + 1/4*a*c^2*x^4/((c^2*x^2 -
 1)^2*d^3) + 1/12*b*c*x^3/((c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*d^3) - 1/2*b*x^
2*arcsin(c*x)/((c^2*x^2 - 1)*d^3) - 1/2*a*x^2/((c^2*x^2 - 1)*d^3) - 1/4*b*x
/(sqrt(-c^2*x^2 + 1)*c*d^3) + 1/4*b*arcsin(c*x)/(c^2*d^3) + 1/4*a/(c^2*d^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \int \frac{x\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^3}\,dx$$

```
[In] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3,x)
[Out] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3, x)
```

3.50 $\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 196

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^3}\,dx = &-\frac{b}{12cd^3(1-c^2x^2)^{3/2}}-\frac{3b}{8cd^3\sqrt{1-c^2x^2}}+\frac{x(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2}\\ &+\frac{3x(a+b\arcsin(cx))}{8d^3(1-c^2x^2)}-\frac{3i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4cd^3}\\ &+\frac{3ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8cd^3}-\frac{3ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8cd^3}\end{aligned}$$

```
[Out] -1/12*b/c/d^3/(-c^2*x^2+1)^(3/2)+1/4*x*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^2
+3/8*x*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)-3/4*I*(a+b*arcsin(c*x))*arctan(I*
c*x+(-c^2*x^2+1)^(1/2))/c/d^3+3/8*I*b*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2
)))/c/d^3-3/8*I*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^3-3/8*b/c/d^3
/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 196, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4747, 4749, 4266, 2317, 2438, 267}

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^3}\,dx = -\frac{3i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4cd^3} + \frac{3x(a+b\arcsin(cx))}{8d^3(1-c^2x^2)} + \frac{x(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} + \frac{3ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8cd^3} - \frac{3ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8cd^3} - \frac{3b}{8cd^3\sqrt{1-c^2x^2}} - \frac{b}{12cd^3(1-c^2x^2)^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/12*b/(c*d^3*(1 - c^2*x^2)^(3/2)) - (3*b)/(8*c*d^3*Sqrt[1 - c^2*x^2]) + (
x*(a + b*ArcSin[c*x]))/(4*d^3*(1 - c^2*x^2)^2) + (3*x*(a + b*ArcSin[c*x]))/
(8*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c
*x])])/(c*d^3) + (((3*I)/8)*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^3) -
 (((3*I)/8)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d^3)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
```

```
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} - \frac{(bc)\int \frac{x}{(1-c^2x^2)^{5/2}}\,dx}{4d^3} + \frac{3\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^2}\,dx}{4d} \\
&= -\frac{b}{12cd^3(1-c^2x^2)^{3/2}} + \frac{x(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} + \frac{3x(a+b\arcsin(cx))}{8d^3(1-c^2x^2)} \\
&\quad - \frac{(3bc)\int \frac{x}{(1-c^2x^2)^{3/2}}\,dx}{8d^3} + \frac{3\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx}{8d^2} \\
&= -\frac{b}{12cd^3(1-c^2x^2)^{3/2}} - \frac{3b}{8cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} \\
&\quad + \frac{3x(a+b\arcsin(cx))}{8d^3(1-c^2x^2)} + \frac{3\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{8cd^3} \\
&= -\frac{b}{12cd^3(1-c^2x^2)^{3/2}} - \frac{3b}{8cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} \\
&\quad + \frac{3x(a+b\arcsin(cx))}{8d^3(1-c^2x^2)} - \frac{3i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4cd^3} \\
&\quad - \frac{(3b)\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{8cd^3} \\
&\quad + \frac{(3b)\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{8cd^3}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{b}{12cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b}{8cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{4d^3\left(1-c^2x^2\right)^2} + \frac{3x(a+b\arcsin(cx))}{8d^3\left(1-c^2x^2\right)} \\
&\quad - \frac{3i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4cd^3} + \frac{(3ib)\text{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{8cd^3} \\
&\quad - \frac{(3ib)\text{Subst}\left(\int \frac{\log(1+ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{8cd^3} \\
&= -\frac{b}{12cd^3\left(1-c^2x^2\right)^{3/2}} - \frac{3b}{8cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))}{4d^3\left(1-c^2x^2\right)^2} \\
&\quad + \frac{3x(a+b\arcsin(cx))}{8d^3\left(1-c^2x^2\right)} - \frac{3i(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4cd^3} \\
&\quad + \frac{3ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8cd^3} - \frac{3ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8cd^3}
\end{aligned}
$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 501 vs. $2(196) = 392$.

Time = 1.14 (sec) , antiderivative size = 501, normalized size of antiderivative = 2.56

$$
\int \frac{a+b\arcsin(cx)}{\left(d-c^2dx^2\right)^3}\,dx =
$$

$$
-\frac{\frac{2b\sqrt{1-c^2x^2}}{3c(-1+cx)^2} - \frac{bx\sqrt{1-c^2x^2}}{3(-1+cx)^2} + \frac{2b\sqrt{1-c^2x^2}}{3c(1+cx)^2} + \frac{bx\sqrt{1-c^2x^2}}{3(1+cx)^2} + \frac{3b\sqrt{1-c^2x^2}}{c-c^2x} + \frac{3b\sqrt{1-c^2x^2}}{c+c^2x} - \frac{4ax}{(-1+c^2x^2)^2} + \frac{6ax}{-1+c^2x^2} + \frac{3ib\pi\arcsin(}{c}}{}
$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/16*((2*b*Sqrt[1 - c^2*x^2])/(3*c*(-1 + c*x)^2) - (b*x*Sqrt[1 - c^2*x^2])
/(3*(-1 + c*x)^2) + (2*b*Sqrt[1 - c^2*x^2])/(3*c*(1 + c*x)^2) + (b*x*Sqrt[1
 - c^2*x^2])/(3*(1 + c*x)^2) + (3*b*Sqrt[1 - c^2*x^2])/(c - c^2*x) + (3*b*S
qrt[1 - c^2*x^2])/(c + c^2*x) - (4*a*x)/(-1 + c^2*x^2)^2 + (6*a*x)/(-1 + c^
2*x^2) + ((3*I)*b*Pi*ArcSin[c*x])/c - (b*ArcSin[c*x])/(c*(-1 + c*x)^2) + (b
*ArcSin[c*x])/(c*(1 + c*x)^2) - (3*b*ArcSin[c*x])/(c - c^2*x) + (3*b*ArcSin
[c*x])/(c + c^2*x) - (3*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])])/c - (6*b*ArcSin[
c*x]*Log[1 - I*E^(I*ArcSin[c*x])])/c - (3*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])]
)/c + (6*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])])/c + (3*a*Log[1 - c*x])
/c - (3*a*Log[1 + c*x])/c + (3*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]])/c +
(3*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])/c - ((6*I)*b*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])])/c + ((6*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])])/c)/d^3
```

Maple [A] (verified)

Time = 0.24 (sec) , antiderivative size = 262, normalized size of antiderivative = 1.34

method	result
derivativedivides	$-\frac{\frac{a\left(-\frac{1}{16(cx-1)^2}+\frac{3}{16(cx-1)}+\frac{3\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}+\frac{3}{16(cx+1)}-\frac{3\ln(cx+1)}{16}\right)}{d^3}-\frac{b\left(\frac{9c^3x^3\arcsin(cx)-9c^2x^2\sqrt{-c^2x^2+1}-15cx\,\mathrm{ar}}{24c^4x^4-48c^2x^2+24}\right.}{}}{}$
default	$-\frac{\frac{a\left(-\frac{1}{16(cx-1)^2}+\frac{3}{16(cx-1)}+\frac{3\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}+\frac{3}{16(cx+1)}-\frac{3\ln(cx+1)}{16}\right)}{d^3}-\frac{b\left(\frac{9c^3x^3\arcsin(cx)-9c^2x^2\sqrt{-c^2x^2+1}-15cx\,\mathrm{ar}}{24c^4x^4-48c^2x^2+24}\right.}{}}{}$
parts	$-\frac{a\left(-\frac{1}{16c(cx-1)^2}+\frac{3}{16c(cx-1)}+\frac{3\ln(cx-1)}{16c}+\frac{1}{16c(cx+1)^2}+\frac{3}{16c(cx+1)}-\frac{3\ln(cx+1)}{16c}\right)}{d^3}-\frac{b\left(\frac{9c^3x^3\arcsin(cx)-9c^2x^2\sqrt{-c^2x^2+}}{24c^4x^4-48}\right.}{}$

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-a/d^3*(-1/16/(c*x-1)^2+3/16/(c*x-1)+3/16*ln(c*x-1)+1/16/(c*x+1)^2+3/1
6/(c*x+1)-3/16*ln(c*x+1))-b/d^3*(1/24*(9*c^3*x^3*arcsin(c*x)-9*c^2*x^2*(-c^
2*x^2+1)^(1/2)-15*c*x*arcsin(c*x)+11*(-c^2*x^2+1)^(1/2))/(c^4*x^4-2*c^2*x^2
+1)+3/8*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/8*arcsin(c*x)*ln(1
-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/8*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+
3/8*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^3}\,dx = \int -\frac{b\arcsin(cx)+a}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2
- d^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^3}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{\left(d-c^2dx^2\right)^3}\,dx=\int -\frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/16*a*(2*(3*c^2*x^3 - 5*x)/(c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3) - 3*log(c*
x + 1)/(c*d^3) + 3*log(c*x - 1)/(c*d^3)) + 1/16*(3*(c^4*x^4 - 2*c^2*x^2 + 1
)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 3*(c^4*x^4 - 2*
c^2*x^2 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(
3*c^3*x^3 - 5*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 16*(c^5*d^3
*x^4 - 2*c^3*d^3*x^2 + c*d^3)*integrate(-1/16*(6*c^3*x^3 - 10*c*x - 3*(c^4*
x^4 - 2*c^2*x^2 + 1)*log(c*x + 1) + 3*(c^4*x^4 - 2*c^2*x^2 + 1)*log(-c*x +
1))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x
^2 - d^3), x))*b/(c^5*d^3*x^4 - 2*c^3*d^3*x^2 + c*d^3)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{\left(d-c^2dx^2\right)^3}\,dx=\int -\frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/(c^2*d*x^2 - d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{\left(d-c^2dx^2\right)^3}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{\left(d-c^2\,d\,x^2\right)^3}\,dx$$

```
[In] int((a + b*asin(c*x))/(d - c^2*d*x^2)^3,x)
```

```
[Out] int((a + b*asin(c*x))/(d - c^2*d*x^2)^3, x)
```

3.51 $\int \frac{a+b\arcsin(cx)}{x(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 173

$$\int \frac{a+b\arcsin(cx)}{x(d-c^2dx^2)^3}\,dx = -\frac{bcx}{12d^3(1-c^2x^2)^{3/2}} - \frac{2bcx}{3d^3\sqrt{1-c^2x^2}} + \frac{a+b\arcsin(cx)}{4d^3(1-c^2x^2)^2} + \frac{a+b\arcsin(cx)}{2d^3(1-c^2x^2)} - \frac{2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} + \frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2d^3} - \frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^3}$$

```
[Out] -1/12*b*c*x/d^3/(-c^2*x^2+1)^(3/2)+1/4*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^2
+1/2*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)-2*(a+b*arcsin(c*x))*arctanh((I*c*x+
(-c^2*x^2+1)^(1/2))^2)/d^3+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)
/d^3-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3-2/3*b*c*x/d^3/(-c^
2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {4793, 4769, 4504, 4268, 2317, 2438, 197, 198}

$$\int \frac{a+b\arcsin(cx)}{x(d-c^2dx^2)^3}\,dx = -\frac{2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^3} + \frac{a+b\arcsin(cx)}{2d^3(1-c^2x^2)} + \frac{a+b\arcsin(cx)}{4d^3(1-c^2x^2)^2} + \frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2d^3} - \frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^3} - \frac{2bcx}{3d^3\sqrt{1-c^2x^2}} - \frac{bcx}{12d^3(1-c^2x^2)^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/12*(b*c*x)/(d^3*(1 - c^2*x^2)^(3/2)) - (2*b*c*x)/(3*d^3*Sqrt[1 - c^2*x^2
]) + (a + b*ArcSin[c*x])/(4*d^3*(1 - c^2*x^2)^2) + (a + b*ArcSin[c*x])/(2*d
^3*(1 - c^2*x^2)) - (2*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/
d^3 + ((I/2)*b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^3 - ((I/2)*b*PolyLog[2
, E^((2*I)*ArcSin[c*x])])/d^3
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
```

```
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{a+b\arcsin(cx)}{4d^3\left(1-c^2x^2\right)^2}-\frac{(bc)\int\frac{1}{\left(1-c^2x^2\right)^{5/2}}\,dx}{4d^3}+\frac{\int\frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^2}\,dx}{d}\\
&= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}}+\frac{a+b\arcsin(cx)}{4d^3\left(1-c^2x^2\right)^2}+\frac{a+b\arcsin(cx)}{2d^3\left(1-c^2x^2\right)}\\
&\quad -\frac{(bc)\int\frac{1}{\left(1-c^2x^2\right)^{3/2}}\,dx}{6d^3}-\frac{(bc)\int\frac{1}{\left(1-c^2x^2\right)^{3/2}}\,dx}{2d^3}+\frac{\int\frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)}\,dx}{d^2}\\
&= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bcx}{3d^3\sqrt{1-c^2x^2}}+\frac{a+b\arcsin(cx)}{4d^3\left(1-c^2x^2\right)^2}\\
&\quad +\frac{a+b\arcsin(cx)}{2d^3\left(1-c^2x^2\right)}+\frac{\operatorname{Subst}\left(\int(a+bx)\csc(x)\sec(x)\,dx,x,\arcsin(cx)\right)}{d^3}\\
&= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bcx}{3d^3\sqrt{1-c^2x^2}}+\frac{a+b\arcsin(cx)}{4d^3\left(1-c^2x^2\right)^2}\\
&\quad +\frac{a+b\arcsin(cx)}{2d^3\left(1-c^2x^2\right)}+\frac{2\operatorname{Subst}\left(\int(a+bx)\csc(2x)\,dx,x,\arcsin(cx)\right)}{d^3}\\
&= -\frac{bcx}{12d^3\left(1-c^2x^2\right)^{3/2}}-\frac{2bcx}{3d^3\sqrt{1-c^2x^2}}+\frac{a+b\arcsin(cx)}{4d^3\left(1-c^2x^2\right)^2}\\
&\quad +\frac{a+b\arcsin(cx)}{2d^3\left(1-c^2x^2\right)}-\frac{2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3}\\
&\quad -\frac{b\operatorname{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d^3}\\
&\quad +\frac{b\operatorname{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d^3}
\end{aligned}
$$

$$= -\frac{bcx}{12d^3(1-c^2x^2)^{3/2}} - \frac{2bcx}{3d^3\sqrt{1-c^2x^2}} + \frac{a+b\arcsin(cx)}{4d^3(1-c^2x^2)^2} + \frac{a+b\arcsin(cx)}{2d^3(1-c^2x^2)} - \frac{2(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} + \frac{(ib)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2d^3} - \frac{(ib)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2d^3}$$

$$= -\frac{bcx}{12d^3(1-c^2x^2)^{3/2}} - \frac{2bcx}{3d^3\sqrt{1-c^2x^2}} + \frac{a+b\arcsin(cx)}{4d^3(1-c^2x^2)^2} + \frac{a+b\arcsin(cx)}{2d^3(1-c^2x^2)} - \frac{2(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} + \frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2d^3} - \frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^3}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 524 vs. $2(173) = 346$.

Time $= 0.86$ (sec) , antiderivative size $= 524$, normalized size of antiderivative $= 3.03$

$$\int\frac{a+b\arcsin(cx)}{x(d-c^2dx^2)^3}\,dx = \frac{-\frac{b\sqrt{1-c^2x^2}}{6(-1+cx)^2} + \frac{bcx\sqrt{1-c^2x^2}}{12(-1+cx)^2} + \frac{b\sqrt{1-c^2x^2}}{6(1+cx)^2} + \frac{bcx\sqrt{1-c^2x^2}}{12(1+cx)^2} + \frac{5b\sqrt{1-c^2x^2}}{-4+4cx} + \frac{5b\sqrt{1-c^2x^2}}{4+4cx} + \frac{a}{(-1+c^2x^2)^2} - \frac{2a}{-1+c^2x^2} - 4ib\pi\,\text{arcsi}}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^3),x]
```

```
[Out] (-1/6*(b*Sqrt[1 - c^2*x^2])/(-1 + c*x)^2 + (b*c*x*Sqrt[1 - c^2*x^2])/(12*(-
1 + c*x)^2) + (b*Sqrt[1 - c^2*x^2])/(6*(1 + c*x)^2) + (b*c*x*Sqrt[1 - c^2*x
^2])/(12*(1 + c*x)^2) + (5*b*Sqrt[1 - c^2*x^2])/(-4 + 4*c*x) + (5*b*Sqrt[1
- c^2*x^2])/(4 + 4*c*x) + a/(-1 + c^2*x^2)^2 - (2*a)/(-1 + c^2*x^2) - (4*I)
*b*Pi*ArcSin[c*x] + (5*b*ArcSin[c*x])/(4 - 4*c*x) + (b*ArcSin[c*x])/(4*(-1
+ c*x)^2) + (b*ArcSin[c*x])/(4*(1 + c*x)^2) + (5*b*ArcSin[c*x])/(4 + 4*c*x)
 - 8*b*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*b*Pi*Log[1 - I*E^(I*ArcSin[c*x]
)] - 4*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b*Pi*Log[1 + I*E^(I*A
rcSin[c*x])] - 4*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 4*b*ArcSin[c*
x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 4*a*Log[x] - 2*a*Log[1 - c^2*x^2] + 8*b
*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 2*
b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*b*PolyLog[2, (-I)*E^(I*ArcSin
[c*x])] + (4*I)*b*PolyLog[2, I*E^(I*ArcSin[c*x])] - (2*I)*b*PolyLog[2, E^((
2*I)*ArcSin[c*x])])/(4*d^3)
```

Maple [A] (verified)

Time = 0.24 (sec) , antiderivative size = 325, normalized size of antiderivative = 1.88

method	result
parts	$-\frac{a\left(-\ln(x)-\frac{1}{16(cx-1)^2}+\frac{5}{16(cx-1)}+\frac{\ln(cx-1)}{2}-\frac{1}{16(cx+1)^2}-\frac{5}{16(cx+1)}+\frac{\ln(cx+1)}{2}\right)}{d^3}-\frac{b\left(\frac{8ic^4x^4-8c^3x^3\sqrt{-c^2x^2+1}+6c^2x^2}{}\right.}{}$
derivativedivides	$-\frac{a\left(-\ln(cx)-\frac{1}{16(cx-1)^2}+\frac{5}{16(cx-1)}+\frac{\ln(cx-1)}{2}-\frac{1}{16(cx+1)^2}-\frac{5}{16(cx+1)}+\frac{\ln(cx+1)}{2}\right)}{d^3}-\frac{b\left(\frac{8ic^4x^4-8c^3x^3\sqrt{-c^2x^2+1}+6c^2x}{}\right.}{}$
default	$-\frac{a\left(-\ln(cx)-\frac{1}{16(cx-1)^2}+\frac{5}{16(cx-1)}+\frac{\ln(cx-1)}{2}-\frac{1}{16(cx+1)^2}-\frac{5}{16(cx+1)}+\frac{\ln(cx+1)}{2}\right)}{d^3}-\frac{b\left(\frac{8ic^4x^4-8c^3x^3\sqrt{-c^2x^2+1}+6c^2x}{}\right.}{}$

```
[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -a/d^3*(-ln(x)-1/16/(c*x-1)^2+5/16/(c*x-1)+1/2*ln(c*x-1)-1/16/(c*x+1)^2-5/1
6/(c*x+1)+1/2*ln(c*x+1))-b/d^3*(1/12*(8*I*c^4*x^4-8*c^3*x^3*(-c^2*x^2+1)^(1
/2)+6*c^2*x^2*arcsin(c*x)-16*I*c^2*x^2+9*c*x*(-c^2*x^2+1)^(1/2)-9*arcsin(c*
x)+8*I)/(c^4*x^4-2*c^2*x^2+1)-arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+I*
polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(
1/2))^2)-1/2*I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-arcsin(c*x)*ln(1-I*
c*x-(-c^2*x^2+1)^(1/2))+I*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^3}\,dx=\int -\frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^3x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3
- d^3*x), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^3}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{a + b \arcsin(cx)}{x(d - c^2dx^2)^3} \, dx = \int -\frac{b \arcsin(cx) + a}{(c^2dx^2 - d)^3 x} \, dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a*((2*c^2*x^2 - 3)/(c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3) + 2*log(c*x + 1
)/d^3 + 2*log(c*x - 1)/d^3 - 4*log(x)/d^3) - b*integrate(arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3
*x), x)
```

Giac [F]

$$\int \frac{a + b \arcsin(cx)}{x(d - c^2dx^2)^3} \, dx = \int -\frac{b \arcsin(cx) + a}{(c^2dx^2 - d)^3 x} \, dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^3*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(cx)}{x(d - c^2dx^2)^3} \, dx = \int \frac{a + b \operatorname{asin}(c\,x)}{x\,(d - c^2\,d\,x^2)^3} \, dx$$

```
[In] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^3),x)
```

```
[Out] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^3), x)
```

3.52 $\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 242

$$\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)^3}\,dx = -\frac{bc}{12d^3(1-c^2x^2)^{3/2}}-\frac{7bc}{8d^3\sqrt{1-c^2x^2}}-\frac{a+b\arcsin(cx)}{d^3x(1-c^2x^2)^2}+\frac{5c^2x(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2}+\frac{15c^2x(a+b\arcsin(cx))}{8d^3(1-c^2x^2)}-\frac{15ic(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3}-\frac{bc\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^3}+\frac{15ibc\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8d^3}-\frac{15ibc\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8d^3}$$

```
[Out] -1/12*b*c/d^3/(-c^2*x^2+1)^(3/2)+(-a-b*arcsin(c*x))/d^3/x/(-c^2*x^2+1)^2+5/
4*c^2*x*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^2+15/8*c^2*x*(a+b*arcsin(c*x))/d
^3/(-c^2*x^2+1)-15/4*I*c*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))
/d^3-b*c*arctanh((-c^2*x^2+1)^(1/2))/d^3+15/8*I*b*c*polylog(2,-I*(I*c*x+(-c
^2*x^2+1)^(1/2)))/d^3-15/8*I*b*c*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^
3-7/8*b*c/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 242, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {4789, 4747, 4749, 4266, 2317, 2438, 267, 272, 53, 65, 214}

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^3}\,dx = &-\frac{15ic\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4d^3}\\&+\frac{15c^2x(a+b\arcsin(cx))}{8d^3\left(1-c^2x^2\right)}+\frac{5c^2x(a+b\arcsin(cx))}{4d^3\left(1-c^2x^2\right)^2}\\&-\frac{a+b\arcsin(cx)}{d^3x\left(1-c^2x^2\right)^2}+\frac{15ibc\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8d^3}\\&-\frac{15ibc\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8d^3}-\frac{b\text{carctanh}\left(\sqrt{1-c^2x^2}\right)}{d^3}\\&-\frac{7bc}{8d^3\sqrt{1-c^2x^2}}-\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/12*(b*c)/(d^3*(1 - c^2*x^2)^(3/2)) - (7*b*c)/(8*d^3*Sqrt[1 - c^2*x^2]) -
 (a + b*ArcSin[c*x])/(d^3*x*(1 - c^2*x^2)^2) + (5*c^2*x*(a + b*ArcSin[c*x])
)/(4*d^3*(1 - c^2*x^2)^2) + (15*c^2*x*(a + b*ArcSin[c*x]))/(8*d^3*(1 - c^2*
x^2)) - (((15*I)/4)*c*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/d^3 -
(b*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d^3 + (((15*I)/8)*b*c*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])])/d^3 - (((15*I)/8)*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3
```

Rule 53

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{a+b\arcsin(cx)}{d^3x\left(1-c^2x^2\right)^2} + \left(5c^2\right)\int\frac{a+b\arcsin(cx)}{\left(d-c^2dx^2\right)^3}\,dx + \frac{(bc)\int\frac{1}{x(1-c^2x^2)^{5/2}}\,dx}{d^3}$$

$$= -\frac{a+b\arcsin(cx)}{d^3x\left(1-c^2x^2\right)^2} + \frac{5c^2x(a+b\arcsin(cx))}{4d^3\left(1-c^2x^2\right)^2} + \frac{(bc)\text{Subst}\left(\int\frac{1}{x(1-c^2x)^{5/2}}\,dx,x,x^2\right)}{2d^3} - \frac{\left(5bc^3\right)\int\frac{x}{(1-c^2x^2)^{5/2}}\,dx}{4d^3} + \frac{\left(15c^2\right)\int\frac{a+b\arcsin(cx)}{(d-c^2dx^2)^2}\,dx}{4d}$$

$$= -\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{a+b\arcsin(cx)}{d^3x\left(1-c^2x^2\right)^2} + \frac{5c^2x(a+b\arcsin(cx))}{4d^3\left(1-c^2x^2\right)^2} + \frac{15c^2x(a+b\arcsin(cx))}{8d^3\left(1-c^2x^2\right)} + \frac{(bc)\text{Subst}\left(\int\frac{1}{x(1-c^2x)^{3/2}}\,dx,x,x^2\right)}{2d^3} - \frac{\left(15bc^3\right)\int\frac{x}{(1-c^2x^2)^{3/2}}\,dx}{8d^3} + \frac{\left(15c^2\right)\int\frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx}{8d^2}$$

$$= -\frac{bc}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{7bc}{8d^3\sqrt{1-c^2x^2}} - \frac{a+b\arcsin(cx)}{d^3x\left(1-c^2x^2\right)^2} + \frac{5c^2x(a+b\arcsin(cx))}{4d^3\left(1-c^2x^2\right)^2} + \frac{15c^2x(a+b\arcsin(cx))}{8d^3\left(1-c^2x^2\right)} + \frac{(15c)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{8d^3} + \frac{(bc)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2d^3}$$

$$= -\frac{bc}{12d^3(1-c^2x^2)^{3/2}} - \frac{7bc}{8d^3\sqrt{1-c^2x^2}} - \frac{a+b\arcsin(cx)}{d^3x(1-c^2x^2)^2} + \frac{5c^2x(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} + \frac{15c^2x(a+b\arcsin(cx))}{8d^3(1-c^2x^2)} - \frac{15ic(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} - \frac{b\text{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{cd^3} - \frac{(15bc)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{8d^3} + \frac{(15bc)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{8d^3}$$

$$= -\frac{bc}{12d^3(1-c^2x^2)^{3/2}} - \frac{7bc}{8d^3\sqrt{1-c^2x^2}} - \frac{a+b\arcsin(cx)}{d^3x(1-c^2x^2)^2} + \frac{5c^2x(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} + \frac{15c^2x(a+b\arcsin(cx))}{8d^3(1-c^2x^2)} - \frac{15ic(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} - \frac{b\text{carctanh}\left(\sqrt{1-c^2x^2}\right)}{d^3} + \frac{(15ibc)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{8d^3} - \frac{(15ibc)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{8d^3}$$

$$= -\frac{bc}{12d^3(1-c^2x^2)^{3/2}} - \frac{7bc}{8d^3\sqrt{1-c^2x^2}} - \frac{a+b\arcsin(cx)}{d^3x(1-c^2x^2)^2} + \frac{5c^2x(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} + \frac{15c^2x(a+b\arcsin(cx))}{8d^3(1-c^2x^2)} - \frac{15ic(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} - \frac{b\text{carctanh}\left(\sqrt{1-c^2x^2}\right)}{d^3} + \frac{15ibc\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8d^3} - \frac{15ibc\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8d^3}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 512 vs. 2(242) = 484.

Time = 1.67 (sec) , antiderivative size = 512, normalized size of antiderivative = 2.12

$$\int\frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)^3}\,dx =$$

$$-\frac{\frac{16a}{x} + \frac{2bc\sqrt{1-c^2x^2}}{3(-1+cx)^2} - \frac{bc^2x\sqrt{1-c^2x^2}}{3(-1+cx)^2} - \frac{7bc\sqrt{1-c^2x^2}}{-1+cx} + \frac{2bc\sqrt{1-c^2x^2}}{3(1+cx)^2} + \frac{bc^2x\sqrt{1-c^2x^2}}{3(1+cx)^2} + \frac{7bc\sqrt{1-c^2x^2}}{1+cx} - \frac{4ac^2x}{(-1+c^2x^2)^2} + \frac{14ac^2x}{-1+c^2x}}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/16*((16*a)/x + (2*b*c*Sqrt[1 - c^2*x^2])/(3*(-1 + c*x)^2) - (b*c^2*x*Sqr
t[1 - c^2*x^2])/(3*(-1 + c*x)^2) - (7*b*c*Sqrt[1 - c^2*x^2])/(-1 + c*x) + (
2*b*c*Sqrt[1 - c^2*x^2])/(3*(1 + c*x)^2) + (b*c^2*x*Sqrt[1 - c^2*x^2])/(3*(
1 + c*x)^2) + (7*b*c*Sqrt[1 - c^2*x^2])/(1 + c*x) - (4*a*c^2*x)/(-1 + c^2*x
^2)^2 + (14*a*c^2*x)/(-1 + c^2*x^2) + (15*I)*b*c*Pi*ArcSin[c*x] + (16*b*Arc
Sin[c*x])/x - (b*c*ArcSin[c*x])/(-1 + c*x)^2 + (7*b*c*ArcSin[c*x])/(-1 + c*
x) + (b*c*ArcSin[c*x])/(1 + c*x)^2 + (7*b*c*ArcSin[c*x])/(1 + c*x) + 16*b*c
*ArcTanh[Sqrt[1 - c^2*x^2]] - 15*b*c*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 30*b
*c*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 15*b*c*Pi*Log[1 + I*E^(I*ArcS
in[c*x])] + 30*b*c*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 15*a*c*Log[1
- c*x] - 15*a*c*Log[1 + c*x] + 15*b*c*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]
+ 15*b*c*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (30*I)*b*c*PolyLog[2, (-I)*E
^(I*ArcSin[c*x])] + (30*I)*b*c*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3
```

Maple [A] (verified)

Time = 0.30 (sec) , antiderivative size = 327, normalized size of antiderivative = 1.35

method	result
derivativedivides	$c\left(-\frac{a\left(\frac{1}{cx}-\frac{1}{16(cx-1)^2}+\frac{7}{16(cx-1)}+\frac{15\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}+\frac{7}{16(cx+1)}-\frac{15\ln(cx+1)}{16}\right)}{d^3}-\frac{b\left(\frac{45c^4x^4\arcsin(cx)-21c^3x^3\sqrt{-c}}{}\right.}{}\right.$
default	$c\left(-\frac{a\left(\frac{1}{cx}-\frac{1}{16(cx-1)^2}+\frac{7}{16(cx-1)}+\frac{15\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}+\frac{7}{16(cx+1)}-\frac{15\ln(cx+1)}{16}\right)}{d^3}-\frac{b\left(\frac{45c^4x^4\arcsin(cx)-21c^3x^3\sqrt{-c}}{}\right.}{}\right.$
parts	$-\frac{a\left(\frac{1}{x}-\frac{c}{16(cx-1)^2}+\frac{7c}{16(cx-1)}+\frac{15c\ln(cx-1)}{16}+\frac{c}{16(cx+1)^2}+\frac{7c}{16(cx+1)}-\frac{15c\ln(cx+1)}{16}\right)}{d^3}-\frac{bc\left(\frac{45c^4x^4\arcsin(cx)-21c^3x^3\sqrt{-c^2x}}{}\right.}{}$

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] c*(-a/d^3*(1/c/x-1/16/(c*x-1)^2+7/16/(c*x-1)+15/16*ln(c*x-1)+1/16/(c*x+1)^2
+7/16/(c*x+1)-15/16*ln(c*x+1))-b/d^3*(1/24*(45*c^4*x^4*arcsin(c*x)-21*c^3*x
^3*(-c^2*x^2+1)^(1/2)-75*c^2*x^2*arcsin(c*x)+23*c*x*(-c^2*x^2+1)^(1/2)+24*a
rcsin(c*x))/c/x/(c^4*x^4-2*c^2*x^2+1)-ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)+ln(1+I
*c*x+(-c^2*x^2+1)^(1/2))+15/8*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2))
)-15/8*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-15/8*I*dilog(1+I*(I*c
*x+(-c^2*x^2+1)^(1/2)))+15/8*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^2\,(d-c^2dx^2)^3}\,dx=\int -\frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^3x^2}\,dx$$

[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")

[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^8 - 3*c^4*d^3*x^6 + 3*c^2*d^3*x^4 - d^3*x^2), x)

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^2\,(d-c^2dx^2)^3}\,dx=-\frac{\int \frac{a}{c^6x^8-3c^4x^6+3c^2x^4-x^2}\,dx+\int \frac{b\,\mathrm{asin}\,(cx)}{c^6x^8-3c^4x^6+3c^2x^4-x^2}\,dx}{d^3}$$

[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**3,x)

[Out] -(Integral(a/(c**6*x**8 - 3*c**4*x**6 + 3*c**2*x**4 - x**2), x) + Integral(b*asin(c*x)/(c**6*x**8 - 3*c**4*x**6 + 3*c**2*x**4 - x**2), x))/d**3

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^2\,(d-c^2dx^2)^3}\,dx=\int -\frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^3x^2}\,dx$$

[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")

[Out] -1/16*a*(2*(15*c^4*x^4 - 25*c^2*x^2 + 8)/(c^4*d^3*x^5 - 2*c^2*d^3*x^3 + d^3*x) - 15*c*log(c*x + 1)/d^3 + 15*c*log(c*x - 1)/d^3) + 1/16*(15*(c^5*x^5 - 2*c^3*x^3 + c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 15*(c^5*x^5 - 2*c^3*x^3 + c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(15*c^4*x^4 - 25*c^2*x^2 + 8)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 16*(c^4*d^3*x^5 - 2*c^2*d^3*x^3 + d^3*x)*integrate(-1/16*(30*c^5*x^4 - 50*c^3*x^2 - 15*(c^6*x^5 - 2*c^4*x^3 + c^2*x)*log(c*x + 1) + 15*(c^6*x^5 - 2*c^4*x^3 + c^2*x)*log(-c*x + 1) + 16*c)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x))*b/(c^4*d^3*x^5 - 2*c^2*d^3*x^3 + d^3*x)

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^3}\,dx = \int -\frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^3x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^3*x^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^3}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{x^2\left(d-c^2\,d\,x^2\right)^3}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^3),x)
[Out] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^3), x)
```

3.53 $\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 248

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^3}\,dx = -\frac{bc}{2d^3x(1-c^2x^2)^{3/2}}+\frac{5bc^3x}{12d^3(1-c^2x^2)^{3/2}}-\frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2}-\frac{a+b\arcsin(cx)}{2d^3x^2(1-c^2x^2)^2}+\frac{3c^2(a+b\arcsin(cx))}{2d^3(1-c^2x^2)}-\frac{6c^2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3}+\frac{3ibc^2\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2d^3}-\frac{3ibc^2\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^3}$$

```
[Out] -1/2*b*c/d^3/x/(-c^2*x^2+1)^(3/2)+5/12*b*c^3*x/d^3/(-c^2*x^2+1)^(3/2)+3/4*c
^2*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^2+1/2*(-a-b*arcsin(c*x))/d^3/x^2/(-c^
2*x^2+1)^2+3/2*c^2*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)-6*c^2*(a+b*arcsin(c*x
))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3+3/2*I*b*c^2*polylog(2,-(I*c*x+
(-c^2*x^2+1)^(1/2))^2)/d^3-3/2*I*b*c^2*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))
^2)/d^3-2/3*b*c^3*x/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules

used = {4789, 4793, 4769, 4504, 4268, 2317, 2438, 197, 198, 277}

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^3}\,dx = -\frac{6c^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^3} + \frac{3c^2(a+b\arcsin(cx))}{2d^3(1-c^2x^2)} + \frac{3c^2(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} - \frac{a+b\arcsin(cx)}{2d^3x^2(1-c^2x^2)^2} + \frac{3ibc^2\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2d^3} - \frac{3ibc^2\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^3} - \frac{bc}{2d^3x(1-c^2x^2)^{3/2}} - \frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}} + \frac{5bc^3x}{12d^3(1-c^2x^2)^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/2*(b*c)/(d^3*x*(1 - c^2*x^2)^(3/2)) + (5*b*c^3*x)/(12*d^3*(1 - c^2*x^2)^
(3/2)) - (2*b*c^3*x)/(3*d^3*Sqrt[1 - c^2*x^2]) + (3*c^2*(a + b*ArcSin[c*x])
)/(4*d^3*(1 - c^2*x^2)^2) - (a + b*ArcSin[c*x])/(2*d^3*x^2*(1 - c^2*x^2)^2)
 + (3*c^2*(a + b*ArcSin[c*x]))/(2*d^3*(1 - c^2*x^2)) - (6*c^2*(a + b*ArcSin
[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^3 + (((3*I)/2)*b*c^2*PolyLog[2, -E
^((2*I)*ArcSin[c*x])])/d^3 - (((3*I)/2)*b*c^2*PolyLog[2, E^((2*I)*ArcSin[c*
x])])/d^3
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rubi steps

$$\text{integral} = -\frac{a+b\arcsin(cx)}{2d^3x^2(1-c^2x^2)^2} + (3c^2)\int \frac{a+b\arcsin(cx)}{x(d-c^2dx^2)^3}\,dx + \frac{(bc)\int \frac{1}{x^2(1-c^2x^2)^{5/2}}\,dx}{2d^3}$$

$$= -\frac{bc}{2d^3x(1-c^2x^2)^{3/2}} + \frac{3c^2(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} - \frac{a+b\arcsin(cx)}{2d^3x^2(1-c^2x^2)^2} - \frac{(3bc^3)\int \frac{1}{(1-c^2x^2)^{5/2}}\,dx}{4d^3} + \frac{(2bc^3)\int \frac{1}{(1-c^2x^2)^{5/2}}\,dx}{d^3} + \frac{(3c^2)\int \frac{a+b\arcsin(cx)}{x(d-c^2dx^2)^2}\,dx}{d}$$

$$= -\frac{bc}{2d^3x(1-c^2x^2)^{3/2}} + \frac{5bc^3x}{12d^3(1-c^2x^2)^{3/2}} + \frac{3c^2(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} - \frac{a+b\arcsin(cx)}{2d^3x^2(1-c^2x^2)^2} + \frac{3c^2(a+b\arcsin(cx))}{2d^3(1-c^2x^2)} - \frac{(bc^3)\int \frac{1}{(1-c^2x^2)^{3/2}}\,dx}{2d^3} + \frac{(4bc^3)\int \frac{1}{(1-c^2x^2)^{3/2}}\,dx}{3d^3} - \frac{(3bc^3)\int \frac{1}{(1-c^2x^2)^{3/2}}\,dx}{2d^3} + \frac{(3c^2)\int \frac{a+b\arcsin(cx)}{x(d-c^2dx^2)}\,dx}{d^2}$$

$$= -\frac{bc}{2d^3x(1-c^2x^2)^{3/2}} + \frac{5bc^3x}{12d^3(1-c^2x^2)^{3/2}} - \frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}} + \frac{3c^2(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} - \frac{a+b\arcsin(cx)}{2d^3x^2(1-c^2x^2)^2} + \frac{3c^2(a+b\arcsin(cx))}{2d^3(1-c^2x^2)} + \frac{(3c^2)\,\text{Subst}\left(\int (a+bx)\csc(x)\sec(x)\,dx, x, \arcsin(cx)\right)}{d^3}$$

$$= -\frac{bc}{2d^3x(1-c^2x^2)^{3/2}} + \frac{5bc^3x}{12d^3(1-c^2x^2)^{3/2}} - \frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}} + \frac{3c^2(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} - \frac{a+b\arcsin(cx)}{2d^3x^2(1-c^2x^2)^2} + \frac{3c^2(a+b\arcsin(cx))}{2d^3(1-c^2x^2)} + \frac{(6c^2)\,\text{Subst}\left(\int (a+bx)\csc(2x)\,dx, x, \arcsin(cx)\right)}{d^3}$$

$$= -\frac{bc}{2d^3x(1-c^2x^2)^{3/2}} + \frac{5bc^3x}{12d^3(1-c^2x^2)^{3/2}} - \frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}} + \frac{3c^2(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} - \frac{a+b\arcsin(cx)}{2d^3x^2(1-c^2x^2)^2} + \frac{3c^2(a+b\arcsin(cx))}{2d^3(1-c^2x^2)} - \frac{6c^2(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} - \frac{(3bc^2)\,\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^3} + \frac{(3bc^2)\,\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^3}$$

$$= -\frac{bc}{2d^3x(1-c^2x^2)^{3/2}} + \frac{5bc^3x}{12d^3(1-c^2x^2)^{3/2}} - \frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}} + \frac{3c^2(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} - \frac{a+b\arcsin(cx)}{2d^3x^2(1-c^2x^2)^2} + \frac{3c^2(a+b\arcsin(cx))}{2d^3(1-c^2x^2)} - \frac{6c^2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} + \frac{(3ibc^2)\operatorname{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2d^3} - \frac{(3ibc^2)\operatorname{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2d^3}$$

$$= -\frac{bc}{2d^3x(1-c^2x^2)^{3/2}} + \frac{5bc^3x}{12d^3(1-c^2x^2)^{3/2}} - \frac{2bc^3x}{3d^3\sqrt{1-c^2x^2}} + \frac{3c^2(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} - \frac{a+b\arcsin(cx)}{2d^3x^2(1-c^2x^2)^2} + \frac{3c^2(a+b\arcsin(cx))}{2d^3(1-c^2x^2)} - \frac{6c^2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} + \frac{3ibc^2\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{2d^3} - \frac{3ibc^2\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^3}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 568 vs. 2(248) = 496.

Time = 1.39 (sec) , antiderivative size = 568, normalized size of antiderivative = 2.29

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^3}\,dx = \frac{-\frac{2a}{x^2} + \frac{ac^2}{(-1+c^2x^2)^2} - \frac{4ac^2}{-1+c^2x^2} + \frac{9bc^2\left(\sqrt{1-c^2x^2}-\arcsin(cx)\right)}{-4+4cx} + \frac{9bc^2\left(\sqrt{1-c^2x^2}+\arcsin(cx)\right)}{4+4cx} - \frac{2b\left(cx\sqrt{1-c^2x^2}+\arcsin(cx)\right)}{x^2} + \cdots}{\cdots}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^3),x]
```

```
[Out] ((-2*a)/x^2 + (a*c^2)/(-1 + c^2*x^2)^2 - (4*a*c^2)/(-1 + c^2*x^2) + (9*b*c^
2*(Sqrt[1 - c^2*x^2] - ArcSin[c*x]))/(-4 + 4*c*x) + (9*b*c^2*(Sqrt[1 - c^2*
x^2] + ArcSin[c*x]))/(4 + 4*c*x) - (2*b*(c*x*Sqrt[1 - c^2*x^2] + ArcSin[c*x
]))/x^2 + (b*c^2*((-2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x]))/(12*(-1 +
c*x)^2) + (b*c^2*((2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x]))/(12*(1 + c*
x)^2) + 12*a*c^2*Log[x] - 6*a*c^2*Log[1 - c^2*x^2] + 3*b*c^2*(I*ArcSin[c*x]
^2 + ArcSin[c*x]*((-3*I)*Pi - 4*Log[1 + I*E^(I*ArcSin[c*x])]) + 2*Pi*(-2*Lo
g[1 + E^((-I)*ArcSin[c*x])] + Log[1 + I*E^(I*ArcSin[c*x])] + 2*Log[Cos[ArcS
in[c*x]/2]] - Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]) + (4*I)*PolyLog[2, (-I)*E^
(I*ArcSin[c*x])]) + 3*b*c^2*(I*ArcSin[c*x]^2 + ArcSin[c*x]*((-I)*Pi - 4*Log
[1 - I*E^(I*ArcSin[c*x])]) + 2*Pi*(-2*Log[1 + E^((-I)*ArcSin[c*x])] - Log[1
 - I*E^(I*ArcSin[c*x])] + 2*Log[Cos[ArcSin[c*x]/2]] + Log[Sin[(Pi + 2*ArcSi
n[c*x])/4]]) + (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]) + 12*b*c^2*(ArcSin[c*
x]*Log[1 - E^((2*I)*ArcSin[c*x])] - (I/2)*(ArcSin[c*x]^2 + PolyLog[2, E^((2
*I)*ArcSin[c*x])])))/(4*d^3)
```

Maple [A] (verified)

Time = 0.31 (sec) , antiderivative size = 385, normalized size of antiderivative = 1.55

method	result
derivativedivides	$c^2\left(-\frac{a\left(\frac{1}{2c^2x^2}-3\ln(cx)-\frac{1}{16(cx-1)^2}+\frac{9}{16(cx-1)}+\frac{3\ln(cx-1)}{2}-\frac{1}{16(cx+1)^2}-\frac{9}{16(cx+1)}+\frac{3\ln(cx+1)}{2}\right)}{d^3}-\frac{b\left(\frac{8ic^6x^6-8c^5x^5\sqrt{-}\right.}{}\right.$
default	$c^2\left(-\frac{a\left(\frac{1}{2c^2x^2}-3\ln(cx)-\frac{1}{16(cx-1)^2}+\frac{9}{16(cx-1)}+\frac{3\ln(cx-1)}{2}-\frac{1}{16(cx+1)^2}-\frac{9}{16(cx+1)}+\frac{3\ln(cx+1)}{2}\right)}{d^3}-\frac{b\left(\frac{8ic^6x^6-8c^5x^5\sqrt{-}\right.}{}\right.$
parts	$-\frac{a\left(\frac{1}{2x^2}-3c^2\ln(x)-\frac{c^2}{16(cx-1)^2}+\frac{9c^2}{16(cx-1)}+\frac{3c^2\ln(cx-1)}{2}-\frac{c^2}{16(cx+1)^2}-\frac{9c^2}{16(cx+1)}+\frac{3c^2\ln(cx+1)}{2}\right)}{d^3}-\frac{b\,c^2\left(\frac{8ic^6x^6-8c^5x^5\sqrt{}\right.}{}\right.$

[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)

[Out] c^2*(-a/d^3*(1/2/c^2/x^2-3*ln(c*x)-1/16/(c*x-1)^2+9/16/(c*x-1)+3/2*ln(c*x-1
)-1/16/(c*x+1)^2-9/16/(c*x+1)+3/2*ln(c*x+1))-b/d^3*(1/12/(c^4*x^4-2*c^2*x^2
+1)/c^2/x^2*(8*I*c^6*x^6-8*c^5*x^5*(-c^2*x^2+1)^(1/2)+18*c^4*x^4*arcsin(c*x
)-16*I*c^4*x^4+3*c^3*x^3*(-c^2*x^2+1)^(1/2)-27*c^2*x^2*arcsin(c*x)+8*I*c^2*
x^2+6*c*x*(-c^2*x^2+1)^(1/2)+6*arcsin(c*x))-3*arcsin(c*x)*ln(1+I*c*x+(-c^2*
x^2+1)^(1/2))+3*I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+3*arcsin(c*x)*ln(1+(
I*c*x+(-c^2*x^2+1)^(1/2))^2)-3/2*I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)
-3*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+3*I*polylog(2,I*c*x+(-c^2*x^2
+1)^(1/2))))

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^3}\,dx=\int -\frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^3x^3}\,dx$$

[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^3,x, algorithm="fricas")

[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^9 - 3*c^4*d^3*x^7 + 3*c^2*d^3*x^5
- d^3*x^3), x)

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^3}\,dx = -\frac{\int \frac{a}{c^6x^9-3c^4x^7+3c^2x^5-x^3}\,dx+\int \frac{b\operatorname{asin}(cx)}{c^6x^9-3c^4x^7+3c^2x^5-x^3}\,dx}{d^3}$$

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**3,x)
[Out] -(Integral(a/(c**6*x**9 - 3*c**4*x**7 + 3*c**2*x**5 - x**3), x) + Integral(
b*asin(c*x)/(c**6*x**9 - 3*c**4*x**7 + 3*c**2*x**5 - x**3), x))/d**3
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^3}\,dx = \int -\frac{b\arcsin(cx)+a}{\left(c^2dx^2-d\right)^3x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
[Out] -1/4*a*((6*c^4*x^4 - 9*c^2*x^2 + 2)/(c^4*d^3*x^6 - 2*c^2*d^3*x^4 + d^3*x^2)
 + 6*c^2*log(c*x + 1)/d^3 + 6*c^2*log(c*x - 1)/d^3 - 12*c^2*log(x)/d^3) - b
*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^9 - 3*c^4*
d^3*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^3}\,dx = \int -\frac{b\arcsin(cx)+a}{\left(c^2dx^2-d\right)^3x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^3,x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^3*x^3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^3}\,dx = \int \frac{a+b\operatorname{asin}(c\,x)}{x^3\left(d-c^2\,d\,x^2\right)^3}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^3),x)
[Out] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^3), x)
```

3.54 $\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 317

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)^3}\,dx &= \frac{bc^3}{12d^3(1-c^2x^2)^{3/2}}-\frac{bc}{6d^3x^2(1-c^2x^2)^{3/2}}-\frac{29bc^3}{24d^3\sqrt{1-c^2x^2}}\\ &-\frac{a+b\arcsin(cx)}{3d^3x^3(1-c^2x^2)^2}-\frac{7c^2(a+b\arcsin(cx))}{3d^3x(1-c^2x^2)^2}\\ &+\frac{35c^4x(a+b\arcsin(cx))}{12d^3(1-c^2x^2)^2}+\frac{35c^4x(a+b\arcsin(cx))}{8d^3(1-c^2x^2)}\\ &-\frac{35ic^3(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3}\\ &-\frac{19bc^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d^3}+\frac{35ibc^3\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8d^3}\\ &-\frac{35ibc^3\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8d^3}\end{aligned}$$

```
[Out] 1/12*b*c^3/d^3/(-c^2*x^2+1)^(3/2)-1/6*b*c/d^3/x^2/(-c^2*x^2+1)^(3/2)+1/3*(-
a-b*arcsin(c*x))/d^3/x^3/(-c^2*x^2+1)^2-7/3*c^2*(a+b*arcsin(c*x))/d^3/x/(-c
^2*x^2+1)^2+35/12*c^4*x*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^2+35/8*c^4*x*(a+
b*arcsin(c*x))/d^3/(-c^2*x^2+1)-35/4*I*c^3*(a+b*arcsin(c*x))*arctan(I*c*x+(
-c^2*x^2+1)^(1/2))/d^3-19/6*b*c^3*arctanh((-c^2*x^2+1)^(1/2))/d^3+35/8*I*b*
c^3*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^3-35/8*I*b*c^3*polylog(2,I*(
I*c*x+(-c^2*x^2+1)^(1/2)))/d^3-29/24*b*c^3/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 317, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {4789, 4747, 4749, 4266, 2317, 2438, 267, 272, 53, 65, 214, 44}

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)^3}\,dx = -\frac{35ic^3\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4d^3}-\frac{7c^2(a+b\arcsin(cx))}{3d^3x(1-c^2x^2)^2}-\frac{a+b\arcsin(cx)}{3d^3x^3(1-c^2x^2)^2}+\frac{35c^4x(a+b\arcsin(cx))}{8d^3(1-c^2x^2)}+\frac{35c^4x(a+b\arcsin(cx))}{12d^3(1-c^2x^2)^2}+\frac{35ibc^3\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8d^3}-\frac{35ibc^3\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8d^3}-\frac{19bc^3\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d^3}-\frac{bc}{6d^3x^2(1-c^2x^2)^{3/2}}-\frac{29bc^3}{24d^3\sqrt{1-c^2x^2}}+\frac{bc^3}{12d^3(1-c^2x^2)^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^3),x]
```

```
[Out] (b*c^3)/(12*d^3*(1 - c^2*x^2)^(3/2)) - (b*c)/(6*d^3*x^2*(1 - c^2*x^2)^(3/2)
) - (29*b*c^3)/(24*d^3*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*x])/(3*d^3*x^3*
(1 - c^2*x^2)^2) - (7*c^2*(a + b*ArcSin[c*x]))/(3*d^3*x*(1 - c^2*x^2)^2) +
(35*c^4*x*(a + b*ArcSin[c*x]))/(12*d^3*(1 - c^2*x^2)^2) + (35*c^4*x*(a + b*
ArcSin[c*x]))/(8*d^3*(1 - c^2*x^2)) - (((35*I)/4)*c^3*(a + b*ArcSin[c*x])*A
rcTan[E^(I*ArcSin[c*x])])/d^3 - (19*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*d^
3) + (((35*I)/8)*b*c^3*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^3 - (((35*I)/8
)*b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 53

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
```

```
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx)}{3d^3x^3\left(1-c^2x^2\right)^2}+\frac{1}{3}\left(7c^2\right)\int\frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^3}\,dx+\frac{(bc)\int\frac{1}{x^3\left(1-c^2x^2\right)^{5/2}}\,dx}{3d^3}\\
&= -\frac{a+b\arcsin(cx)}{3d^3x^3\left(1-c^2x^2\right)^2}-\frac{7c^2(a+b\arcsin(cx))}{3d^3x\left(1-c^2x^2\right)^2}+\frac{1}{3}\left(35c^4\right)\int\frac{a+b\arcsin(cx)}{\left(d-c^2dx^2\right)^3}\,dx\\
&\quad+\frac{(bc)\mathrm{Subst}\left(\int\frac{1}{x^2\left(1-c^2x\right)^{5/2}}\,dx,x,x^2\right)}{6d^3}+\frac{\left(7bc^3\right)\int\frac{1}{x\left(1-c^2x^2\right)^{5/2}}\,dx}{3d^3}\\
&= -\frac{bc}{6d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{a+b\arcsin(cx)}{3d^3x^3\left(1-c^2x^2\right)^2}\\
&\quad-\frac{7c^2(a+b\arcsin(cx))}{3d^3x\left(1-c^2x^2\right)^2}+\frac{35c^4x(a+b\arcsin(cx))}{12d^3\left(1-c^2x^2\right)^2}\\
&\quad+\frac{\left(5bc^3\right)\mathrm{Subst}\left(\int\frac{1}{x\left(1-c^2x\right)^{5/2}}\,dx,x,x^2\right)}{12d^3}+\frac{\left(7bc^3\right)\mathrm{Subst}\left(\int\frac{1}{x\left(1-c^2x\right)^{5/2}}\,dx,x,x^2\right)}{6d^3}\\
&\quad-\frac{\left(35bc^5\right)\int\frac{x}{\left(1-c^2x^2\right)^{5/2}}\,dx}{12d^3}+\frac{\left(35c^4\right)\int\frac{a+b\arcsin(cx)}{\left(d-c^2dx^2\right)^2}\,dx}{4d}
\end{aligned}$$

$$= \frac{bc^3}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{bc}{6d^3x^2\left(1-c^2x^2\right)^{3/2}} - \frac{a+b\arcsin(cx)}{3d^3x^3\left(1-c^2x^2\right)^2} - \frac{7c^2(a+b\arcsin(cx))}{3d^3x\left(1-c^2x^2\right)^2} + \frac{35c^4x(a+b\arcsin(cx))}{12d^3\left(1-c^2x^2\right)^2} + \frac{35c^4x(a+b\arcsin(cx))}{8d^3\left(1-c^2x^2\right)} + \frac{(5bc^3)\,\text{Subst}\left(\int \frac{1}{x(1-c^2x)^{3/2}}\,dx, x, x^2\right)}{12d^3} + \frac{(7bc^3)\,\text{Subst}\left(\int \frac{1}{x(1-c^2x)^{3/2}}\,dx, x, x^2\right)}{6d^3} - \frac{(35bc^5)\int \frac{x}{(1-c^2x^2)^{3/2}}\,dx}{8d^3} + \frac{(35c^4)\int \frac{a+b\arcsin(cx)}{d-c^2dx^2}\,dx}{8d^2}$$

$$= \frac{bc^3}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{bc}{6d^3x^2\left(1-c^2x^2\right)^{3/2}} - \frac{29bc^3}{24d^3\sqrt{1-c^2x^2}} - \frac{a+b\arcsin(cx)}{3d^3x^3\left(1-c^2x^2\right)^2} - \frac{7c^2(a+b\arcsin(cx))}{3d^3x\left(1-c^2x^2\right)^2} + \frac{35c^4x(a+b\arcsin(cx))}{12d^3\left(1-c^2x^2\right)^2} + \frac{35c^4x(a+b\arcsin(cx))}{8d^3\left(1-c^2x^2\right)} + \frac{(35c^3)\,\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{8d^3} + \frac{(5bc^3)\,\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx, x, x^2\right)}{12d^3} + \frac{(7bc^3)\,\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx, x, x^2\right)}{6d^3}$$

$$= \frac{bc^3}{12d^3\left(1-c^2x^2\right)^{3/2}} - \frac{bc}{6d^3x^2\left(1-c^2x^2\right)^{3/2}} - \frac{29bc^3}{24d^3\sqrt{1-c^2x^2}} - \frac{a+b\arcsin(cx)}{3d^3x^3\left(1-c^2x^2\right)^2} - \frac{7c^2(a+b\arcsin(cx))}{3d^3x\left(1-c^2x^2\right)^2} + \frac{35c^4x(a+b\arcsin(cx))}{12d^3\left(1-c^2x^2\right)^2} + \frac{35c^4x(a+b\arcsin(cx))}{8d^3\left(1-c^2x^2\right)} - \frac{35ic^3(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} - \frac{(5bc)\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{6d^3} - \frac{(7bc)\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{3d^3} - \frac{(35bc^3)\,\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{8d^3} + \frac{(35bc^3)\,\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{8d^3}$$

$$
\begin{aligned}
= & \frac{bc^3}{12d^3(1-c^2x^2)^{3/2}} - \frac{bc}{6d^3x^2(1-c^2x^2)^{3/2}} - \frac{29bc^3}{24d^3\sqrt{1-c^2x^2}} \\
& - \frac{a+b\arcsin(cx)}{3d^3x^3(1-c^2x^2)^2} - \frac{7c^2(a+b\arcsin(cx))}{3d^3x(1-c^2x^2)^2} + \frac{35c^4x(a+b\arcsin(cx))}{12d^3(1-c^2x^2)^2} \\
& + \frac{35c^4x(a+b\arcsin(cx))}{8d^3(1-c^2x^2)} - \frac{35ic^3(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} \\
& - \frac{19bc^3\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d^3} + \frac{(35ibc^3)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{8d^3} \\
& - \frac{(35ibc^3)\operatorname{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{8d^3}
\end{aligned}
$$

$$
\begin{aligned}
= & \frac{bc^3}{12d^3(1-c^2x^2)^{3/2}} - \frac{bc}{6d^3x^2(1-c^2x^2)^{3/2}} - \frac{29bc^3}{24d^3\sqrt{1-c^2x^2}} - \frac{a+b\arcsin(cx)}{3d^3x^3(1-c^2x^2)^2} \\
& - \frac{7c^2(a+b\arcsin(cx))}{3d^3x(1-c^2x^2)^2} + \frac{35c^4x(a+b\arcsin(cx))}{12d^3(1-c^2x^2)^2} + \frac{35c^4x(a+b\arcsin(cx))}{8d^3(1-c^2x^2)} \\
& - \frac{35ic^3(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} - \frac{19bc^3\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d^3} \\
& + \frac{35ibc^3\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{8d^3} - \frac{35ibc^3\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{8d^3}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.80 (sec) , antiderivative size = 587, normalized size of antiderivative = 1.85

$$
\int\frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)^3}\,dx =
$$

$$
-\frac{\frac{16a}{x^3}+\frac{144ac^2}{x}+\frac{8bc\sqrt{1-c^2x^2}}{x^2}+\frac{2bc^3\sqrt{1-c^2x^2}}{(-1+cx)^2}-\frac{bc^4x\sqrt{1-c^2x^2}}{(-1+cx)^2}-\frac{33bc^3\sqrt{1-c^2x^2}}{-1+cx}+\frac{2bc^3\sqrt{1-c^2x^2}}{(1+cx)^2}+\frac{bc^4x\sqrt{1-c^2x^2}}{(1+cx)^2}+\frac{33bc^3\sqrt{1}}{1+c}}{}
$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/48*((16*a)/x^3 + (144*a*c^2)/x + (8*b*c*Sqrt[1 - c^2*x^2])/x^2 + (2*b*c^
3*Sqrt[1 - c^2*x^2])/(-1 + c*x)^2 - (b*c^4*x*Sqrt[1 - c^2*x^2])/(-1 + c*x)^
2 - (33*b*c^3*Sqrt[1 - c^2*x^2])/(-1 + c*x) + (2*b*c^3*Sqrt[1 - c^2*x^2])/(
1 + c*x)^2 + (b*c^4*x*Sqrt[1 - c^2*x^2])/(1 + c*x)^2 + (33*b*c^3*Sqrt[1 - c
^2*x^2])/(1 + c*x) - (12*a*c^4*x)/(-1 + c^2*x^2)^2 + (66*a*c^4*x)/(-1 + c^2
*x^2) + (105*I)*b*c^3*Pi*ArcSin[c*x] + (16*b*ArcSin[c*x])/x^3 + (144*b*c^2*
ArcSin[c*x])/x - (3*b*c^3*ArcSin[c*x])/(-1 + c*x)^2 + (33*b*c^3*ArcSin[c*x]
)/(-1 + c*x) + (3*b*c^3*ArcSin[c*x])/(1 + c*x)^2 + (33*b*c^3*ArcSin[c*x])/(
1 + c*x) + 152*b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]] - 105*b*c^3*Pi*Log[1 - I*E^
(I*ArcSin[c*x])] - 210*b*c^3*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 105
*b*c^3*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 210*b*c^3*ArcSin[c*x]*Log[1 + I*E^
```

```
(I*ArcSin[c*x])] + 105*a*c^3*Log[1 - c*x] - 105*a*c^3*Log[1 + c*x] + 105*b*
c^3*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 105*b*c^3*Pi*Log[Sin[(Pi + 2*Arc
Sin[c*x])/4]] - (210*I)*b*c^3*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (210*I)*
b*c^3*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3
```

Maple [A] (verified)

Time = 0.38 (sec) , antiderivative size = 372, normalized size of antiderivative = 1.17

method	result
derivativedivides	$c^3\left(-\frac{a\left(\frac{1}{3c^3x^3}+\frac{3}{cx}-\frac{1}{16(cx-1)^2}+\frac{11}{16(cx-1)}+\frac{35\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}+\frac{11}{16(cx+1)}-\frac{35\ln(cx+1)}{16}\right)}{d^3}-\frac{b\left(\frac{105\arcsin(cx)c^6x^6-}{}\right.}{}\right.$
default	$c^3\left(-\frac{a\left(\frac{1}{3c^3x^3}+\frac{3}{cx}-\frac{1}{16(cx-1)^2}+\frac{11}{16(cx-1)}+\frac{35\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}+\frac{11}{16(cx+1)}-\frac{35\ln(cx+1)}{16}\right)}{d^3}-\frac{b\left(\frac{105\arcsin(cx)c^6x^6-}{}\right.}{}\right.$
parts	$-\frac{a\left(\frac{1}{3x^3}+\frac{3c^2}{x}-\frac{c^3}{16(cx-1)^2}+\frac{11c^3}{16(cx-1)}+\frac{35c^3\ln(cx-1)}{16}+\frac{c^3}{16(cx+1)^2}+\frac{11c^3}{16(cx+1)}-\frac{35c^3\ln(cx+1)}{16}\right)}{d^3}-\frac{b\,c^3\left(\frac{105\arcsin(cx)c^6x^6-}{}\right.}{}$

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(-a/d^3*(1/3/c^3/x^3+3/c/x-1/16/(c*x-1)^2+11/16/(c*x-1)+35/16*ln(c*x-1)
+1/16/(c*x+1)^2+11/16/(c*x+1)-35/16*ln(c*x+1))-b/d^3*(1/24*(105*arcsin(c*x)
*c^6*x^6-29*c^5*x^5*(-c^2*x^2+1)^(1/2)-175*c^4*x^4*arcsin(c*x)+27*c^3*x^3*(
-c^2*x^2+1)^(1/2)+56*c^2*x^2*arcsin(c*x)+4*c*x*(-c^2*x^2+1)^(1/2)+8*arcsin(
c*x))/(c^4*x^4-2*c^2*x^2+1)/c^3/x^3-19/6*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)+19/
6*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+35/8*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1
)^(1/2)))-35/8*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-35/8*I*dilog(
1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+35/8*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))
)))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^3}\,dx=\int -\frac{b\arcsin\left(cx\right)+a}{\left(c^2dx^2-d\right)^3x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)/(c^6*d^3*x^10 - 3*c^4*d^3*x^8 + 3*c^2*d^3*x^6
 - d^3*x^4), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^3}\,dx=-\frac{\int \frac{a}{c^6x^{10}-3c^4x^8+3c^2x^6-x^4}\,dx+\int \frac{b\operatorname{asin}(cx)}{c^6x^{10}-3c^4x^8+3c^2x^6-x^4}\,dx}{d^3}$$

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**3,x)
[Out] -(Integral(a/(c**6*x**10 - 3*c**4*x**8 + 3*c**2*x**6 - x**4), x) + Integral
(b*asin(c*x)/(c**6*x**10 - 3*c**4*x**8 + 3*c**2*x**6 - x**4), x))/d**3
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^3}\,dx=\int -\frac{b\arcsin(cx)+a}{\left(c^2dx^2-d\right)^3x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
[Out] 1/48*a*(105*c^3*log(c*x + 1)/d^3 - 105*c^3*log(c*x - 1)/d^3 - 2*(105*c^6*x^
6 - 175*c^4*x^4 + 56*c^2*x^2 + 8)/(c^4*d^3*x^7 - 2*c^2*d^3*x^5 + d^3*x^3))
+ 1/48*(105*(c^7*x^7 - 2*c^5*x^5 + c^3*x^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))*log(c*x + 1) - 105*(c^7*x^7 - 2*c^5*x^5 + c^3*x^3)*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(105*c^6*x^6 - 175*c^4*x^4
 + 56*c^2*x^2 + 8)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 48*(c^4*d^3
*x^7 - 2*c^2*d^3*x^5 + d^3*x^3)*integrate(-1/48*(210*c^7*x^6 - 350*c^5*x^4
+ 112*c^3*x^2 - 105*(c^8*x^7 - 2*c^6*x^5 + c^4*x^3)*log(c*x + 1) + 105*(c^8
*x^7 - 2*c^6*x^5 + c^4*x^3)*log(-c*x + 1) + 16*c)*sqrt(c*x + 1)*sqrt(-c*x +
 1)/(c^6*d^3*x^9 - 3*c^4*d^3*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x))*b/(c^4*d^3
*x^7 - 2*c^2*d^3*x^5 + d^3*x^3)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^3}\,dx=\int -\frac{b\arcsin(cx)+a}{\left(c^2dx^2-d\right)^3x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^3,x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)/((c^2*d*x^2 - d)^3*x^4), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^3}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^4\,\left(d-c^2\,d\,x^2\right)^3}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^3),x)
[Out] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^3), x)
```

3.55 $\int x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 262

$$\int x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\frac{bx^2\sqrt{d-c^2dx^2}}{32c^3\sqrt{1-c^2x^2}}+\frac{bx^4\sqrt{d-c^2dx^2}}{96c\sqrt{1-c^2x^2}}-\frac{bcx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^4}-\frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{24c^2}+\frac{1}{6}x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc^5\sqrt{1-c^2x^2}}$$

```
[Out] -1/16*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4-1/24*x^3*(a+b*arcsin(c*x
))*(-c^2*d*x^2+d)^(1/2)/c^2+1/6*x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))+
1/32*b*x^2*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/96*b*x^4*(-c^2*d*x
^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/36*b*c*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^
2+1)^(1/2)+1/32*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c^5/(-c^2*x^2+1)
^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 262, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4783, 4795, 4737, 30}

$$\int x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{1}{6}x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{24c^2} + \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc^5\sqrt{1-c^2x^2}} - \frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^4} - \frac{bcx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}} + \frac{bx^4\sqrt{d-c^2dx^2}}{96c\sqrt{1-c^2x^2}} + \frac{bx^2\sqrt{d-c^2dx^2}}{32c^3\sqrt{1-c^2x^2}}$$

```
[In] Int[x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*x^2*Sqrt[d - c^2*d*x^2])/(32*c^3*Sqrt[1 - c^2*x^2]) + (b*x^4*Sqrt[d - c^
2*d*x^2])/(96*c*Sqrt[1 - c^2*x^2]) - (b*c*x^6*Sqrt[d - c^2*d*x^2])/(36*Sqrt
[1 - c^2*x^2]) - (x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*c^4) - (x^
3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(24*c^2) + (x^5*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x]))/6 + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3
2*b*c^5*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
```

```
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{6}x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad+\frac{\sqrt{d-c^2dx^2}\int\frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{6\sqrt{1-c^2x^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int x^5\,dx}{6\sqrt{1-c^2x^2}} \\
&= -\frac{bcx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}-\frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{24c^2} \\
&\quad+\frac{1}{6}x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad+\frac{\sqrt{d-c^2dx^2}\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{8c^2\sqrt{1-c^2x^2}}+\frac{\left(b\sqrt{d-c^2dx^2}\right)\int x^3\,dx}{24c\sqrt{1-c^2x^2}} \\
&= \frac{bx^4\sqrt{d-c^2dx^2}}{96c\sqrt{1-c^2x^2}}-\frac{bcx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^4} \\
&\quad-\frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{24c^2}+\frac{1}{6}x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad+\frac{\sqrt{d-c^2dx^2}\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{16c^4\sqrt{1-c^2x^2}}+\frac{\left(b\sqrt{d-c^2dx^2}\right)\int x\,dx}{16c^3\sqrt{1-c^2x^2}} \\
&= \frac{bx^2\sqrt{d-c^2dx^2}}{32c^3\sqrt{1-c^2x^2}}+\frac{bx^4\sqrt{d-c^2dx^2}}{96c\sqrt{1-c^2x^2}}-\frac{bcx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}} \\
&\quad-\frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^4}-\frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{24c^2} \\
&\quad+\frac{1}{6}x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc^5\sqrt{1-c^2x^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 169, normalized size of antiderivative = 0.65

$$\int x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$=\frac{\sqrt{d-c^2dx^2}\left(9a^2+b^2c^2x^2(9+3c^2x^2-8c^4x^4)+6abcx\sqrt{1-c^2x^2}(-3-2c^2x^2+8c^4x^4)+6b\left(3a+bcx\sqrt{1-\right.\right.}{288bc^5\sqrt{1-c^2x^2}}$$

[In] Integrate[x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]

[Out] (Sqrt[d - c^2*d*x^2]*(9*a^2 + b^2*c^2*x^2*(9 + 3*c^2*x^2 - 8*c^4*x^4) + 6*a*b*c*x*Sqrt[1 - c^2*x^2]*(-3 - 2*c^2*x^2 + 8*c^4*x^4) + 6*b*(3*a + b*c*x*Sqrt[1 - c^2*x^2]*(-3 - 2*c^2*x^2 + 8*c^4*x^4))*ArcSin[c*x] + 9*b^2*ArcSin[c*x]^2))/(288*b*c^5*Sqrt[1 - c^2*x^2])

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.21 (sec) , antiderivative size = 673, normalized size of antiderivative = 2.57

method	result
default	$-\frac{a\,x^3(-c^2d\,x^2+d)^{\frac{3}{2}}}{6c^2d}-\frac{ax(-c^2d\,x^2+d)^{\frac{3}{2}}}{8c^4d}+\frac{ax\sqrt{-c^2d\,x^2+d}}{16c^4}+\frac{ad\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{16c^4\sqrt{c^2d}}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}}{32c^5(c^2x^2-1)}\right.$
parts	$-\frac{a\,x^3(-c^2d\,x^2+d)^{\frac{3}{2}}}{6c^2d}-\frac{ax(-c^2d\,x^2+d)^{\frac{3}{2}}}{8c^4d}+\frac{ax\sqrt{-c^2d\,x^2+d}}{16c^4}+\frac{ad\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{16c^4\sqrt{c^2d}}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}}{32c^5(c^2x^2-1)}\right.$

[In] int(x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] -1/6*a*x^3*(-c^2*d*x^2+d)^(3/2)/c^2/d-1/8*a/c^4*x*(-c^2*d*x^2+d)^(3/2)/d+1/16*a/c^4*x*(-c^2*d*x^2+d)^(1/2)+1/16*a/c^4*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-1/32*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/(c^2*x^2-1)*arcsin(c*x)^2+1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*(I+6*arcsin(c*x))/c^5/(c^2*x^2-1)-1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))/c^5/(c^2*x^2-1)+1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(7*I+48*arcsin(c*x))*cos(5*arcsin(c*x))/c^5/(c^2*x^2-1)-1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(11*I+24*arcsin(c*x))*sin(5*arcsin(c*x))/c^5/(c^2*x^2-1)-3/512*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*cos(3*arcsin(c*x))/c^5/(c^2*x^2-1)-1/512*(-d*

```
(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(8*arcsin(c*x)+I)*s
in(3*arcsin(c*x))/c^5/(c^2*x^2-1))
```

Fricas [F]

$$\int x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)x^4\,dx$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F]

$$\int x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int x^4\sqrt{-d(cx-1)(cx+1)}(a+b\,\mathrm{asin}(cx))\,dx$$

```
[In] integrate(x**4*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
[Out] Integral(x**4*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)x^4\,dx$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] b*sqrt(d)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*x^4*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)), x) - 1/48*(8*(-c^2*d*x^2 + d)^(3/2)*x^3/(c^2*d) - 3*s
qrt(-c^2*d*x^2 + d)*x/c^4 + 6*(-c^2*d*x^2 + d)^(3/2)*x/(c^4*d) - 3*sqrt(d)*
arcsin(c*x)/c^5)*a
```

Giac [F]

$$\int x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)x^4\,dx$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int x^4\,(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
[Out] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.56 $\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 189

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{bx^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}}-\frac{bcx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2} + \frac{1}{4}x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc^3\sqrt{1-c^2x^2}}$$

```
[Out] -1/8*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+1/4*x^3*(-c^2*d*x^2+d)^(1
/2)*(a+b*arcsin(c*x))+1/16*b*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-
1/16*b*c*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/16*(a+b*arcsin(c*x))
^2*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 189, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4783, 4795, 4737, 30}

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = -\frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2} + \frac{1}{4}x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc^3\sqrt{1-c^2x^2}} + \frac{bx^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}}-\frac{bcx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}$$

```
[In] Int[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*x^2*Sqrt[d - c^2*d*x^2])/(16*c*Sqrt[1 - c^2*x^2]) - (b*c*x^4*Sqrt[d - c^
2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/(8*c^2) + (x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/4 + (Sqrt[d - c
^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{4}x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{\sqrt{d-c^2dx^2}\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int x^3\,dx}{4\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{bcx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2} \\
&\quad + \frac{1}{4}x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad + \frac{\sqrt{d-c^2dx^2}\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{8c^2\sqrt{1-c^2x^2}} + \frac{\left(b\sqrt{d-c^2dx^2}\right)\int x\,dx}{8c\sqrt{1-c^2x^2}} \\
&= \frac{bx^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}} - \frac{bcx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2} \\
&\quad + \frac{1}{4}x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.74

$$
\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx
$$
$$
= \frac{\sqrt{d-c^2dx^2}\left(a^2+b^2c^2x^2(1-c^2x^2)+2abcx\sqrt{1-c^2x^2}(-1+2c^2x^2)+2b\left(a+bcx\sqrt{1-c^2x^2}(-1+2c^2x^2)\right)\right.}{16bc^3\sqrt{1-c^2x^2}}
$$

```
[In] Integrate[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(a^2 + b^2*c^2*x^2*(1 - c^2*x^2) + 2*a*b*c*x*Sqrt[1 -
c^2*x^2]*(-1 + 2*c^2*x^2) + 2*b*(a + b*c*x*Sqrt[1 - c^2*x^2]*(-1 + 2*c^2*x^
2))*ArcSin[c*x] + b^2*ArcSin[c*x]^2))/(16*b*c^3*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.12 (sec) , antiderivative size = 367, normalized size of antiderivative = 1.94

method	result
default	$-\frac{ax(-c^2dx^2+d)^{\frac{3}{2}}}{4c^2d}+\frac{ax\sqrt{-c^2dx^2+d}}{8c^2}+\frac{ad\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8c^2\sqrt{c^2d}}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{16c^3(c^2x^2-1)}+\frac{\sqrt{-d(}}{}\right.$
parts	$-\frac{ax(-c^2dx^2+d)^{\frac{3}{2}}}{4c^2d}+\frac{ax\sqrt{-c^2dx^2+d}}{8c^2}+\frac{ad\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8c^2\sqrt{c^2d}}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{16c^3(c^2x^2-1)}+\frac{\sqrt{-d(}}{}\right.$

```
[In] int(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/8*a/c^2*x*(-c^2*d*x^2+d)^(1/2)+1/8*a/
c^2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-1/16*(
```

```
-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2+1/25
6*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c
^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(4*arcsin(c*
x)+I)/c^3/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(8*I*(-c^2*x^2+1)^(1/2)*
c^4*x^4+8*c^5*x^5-8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3+I*(-c^2*x^2+1)^
(1/2)+4*c*x)*(-I+4*arcsin(c*x))/c^3/(c^2*x^2-1))
```

Fricas [F]

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*x^2*arcsin(c*x) + a*x^2), x)
```

Sympy [F]

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int x^2\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\operatorname{asin}{(cx)})\;dx$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
[Out] Integral(x**2*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] b*sqrt(d)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*x^2*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)), x) + 1/8*a*(sqrt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^
2 + d)^(3/2)*x/(c^2*d) + sqrt(d)*arcsin(c*x)/c^3)
```

Giac [F]

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int x^2\,(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
[Out] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.57 $\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 24, antiderivative size = 116

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = -\frac{bcx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}$$

```
[Out] 1/2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))-1/4*b*c*x^2*(-c^2*d*x^2+d)^(1/
2)/(-c^2*x^2+1)^(1/2)+1/4*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^
2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4741, 4737, 30}

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{1}{2}x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}$$

```
[In] Int[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/4*(b*c*x^2*Sqrt[d - c^2*d*x^2])/Sqrt[1 - c^2*x^2] + (x*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x]))/2 + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*
b*c*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{1}{2}x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\ &\quad+\frac{\sqrt{d-c^2dx^2}\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int x\,dx}{2\sqrt{1-c^2x^2}} \\ &= -\frac{bcx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.96

$$\int\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$=\frac{\sqrt{d-c^2dx^2}\left(a^2-b^2c^2x^2+2abcx\sqrt{1-c^2x^2}+2b\left(a+bcx\sqrt{1-c^2x^2}\right)\arcsin(cx)+b^2\arcsin(cx)^2\right)}{4bc\sqrt{1-c^2x^2}}$$

```
[In] Integrate[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(a^2 - b^2*c^2*x^2 + 2*a*b*c*x*Sqrt[1 - c^2*x^2] + 2*b
*(a + b*c*x*Sqrt[1 - c^2*x^2])*ArcSin[c*x] + b^2*ArcSin[c*x]^2))/(4*b*c*Sqr
t[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.12 (sec) , antiderivative size = 280, normalized size of antiderivative = 2.41

method	result
default	$\frac{ax\sqrt{-c^2dx^2+d}}{2}+\frac{ad\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{2\sqrt{c^2d}}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{4c(c^2x^2-1)}+\frac{\sqrt{-d(c^2x^2-1)}\,\left(-2i\sqrt{-c^2x^2+1}\,x\right.}{}\right.$
parts	$\frac{ax\sqrt{-c^2dx^2+d}}{2}+\frac{ad\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{2\sqrt{c^2d}}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{4c(c^2x^2-1)}+\frac{\sqrt{-d(c^2x^2-1)}\,\left(-2i\sqrt{-c^2x^2+1}\,x\right.}{}\right.$

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] 1/2*a*x*(-c^2*d*x^2+d)^(1/2)+1/2*a*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(
-c^2*d*x^2+d)^(1/2))+b*(-1/4*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c
^2*x^2-1)*arcsin(c*x)^2+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2
)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*(I+2*arcsin(c*x))/c/(c^2*x^
2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-
I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))/c/(c^2*x^2-1))
```

Fricas [F]

$$\int\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int\sqrt{-d(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))\;dx$$

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1)), x) + 1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)
*a
```

Giac [F(-2)]

Exception generated.

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.58 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 110

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^2}\,dx = -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x} - \frac{c\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2b\sqrt{1-c^2x^2}} + \frac{bc\sqrt{d-c^2dx^2}\log(x)}{\sqrt{1-c^2x^2}}$$

```
[Out] -(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x-1/2*c*(a+b*arcsin(c*x))^2*(-c^2*d
*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)+b*c*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2
+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4781, 29, 4737}

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^2}\,dx = -\frac{c\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2b\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x} + \frac{bc\log(x)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -((Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x) - (c*Sqrt[d - c^2*d*x^2]*(a
+ b*ArcSin[c*x])^2)/(2*b*Sqrt[1 - c^2*x^2]) + (b*c*Sqrt[d - c^2*d*x^2]*Log[
x])/Sqrt[1 - c^2*x^2]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}+\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{1}{x}\,dx}{\sqrt{1-c^2x^2}}\\&\quad-\frac{\left(c^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}\\&=-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}-\frac{c\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2b\sqrt{1-c^2x^2}}+\frac{bc\sqrt{d-c^2dx^2}\log(x)}{\sqrt{1-c^2x^2}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.29

$$\begin{aligned}&\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^2}\,dx\\&=-\frac{a\sqrt{-d(-1+c^2x^2)}}{x}+ac\sqrt{d}\arctan\left(\frac{cx\sqrt{-d(-1+c^2x^2)}}{\sqrt{d}(-1+c^2x^2)}\right)\\&\quad-\frac{bc\sqrt{d(1-c^2x^2)}\left(\frac{2\sqrt{1-c^2x^2}\arcsin(cx)}{cx}+\arcsin(cx)^2-2\log(cx)\right)}{2\sqrt{1-c^2x^2}}\end{aligned}$$

[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^2,x]

[Out] -((a*Sqrt[-(d*(-1 + c^2*x^2))])/x) + a*c*Sqrt[d]*ArcTan[(c*x*Sqrt[-(d*(-1 + c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))] - (b*c*Sqrt[d*(1 - c^2*x^2)]*((2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*x) + ArcSin[c*x]^2 - 2*Log[c*x]))/(2*Sqrt[1 - c^2*x^2])

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.15 (sec) , antiderivative size = 298, normalized size of antiderivative = 2.71

method	result
default	$-\frac{a\left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}{d x}-a\,c^{2} x \sqrt{-c^{2} d\,x^{2}+d}-\frac{a\,c^{2} d \arctan\left(\frac{\sqrt{c^{2} d}\,x}{\sqrt{-c^{2} d\,x^{2}+d}}\right)}{\sqrt{c^{2} d}}+b\left(\frac{\sqrt{-d\left(c^{2} x^{2}-1\right)}\,\sqrt{-c^{2} x^{2}+1}\,\arcsin\left(c x\right)^{2} c}{2 c^{2} x^{2}-2}+\right.$
parts	$-\frac{a\left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}{d x}-a\,c^{2} x \sqrt{-c^{2} d\,x^{2}+d}-\frac{a\,c^{2} d \arctan\left(\frac{\sqrt{c^{2} d}\,x}{\sqrt{-c^{2} d\,x^{2}+d}}\right)}{\sqrt{c^{2} d}}+b\left(\frac{\sqrt{-d\left(c^{2} x^{2}-1\right)}\,\sqrt{-c^{2} x^{2}+1}\,\arcsin\left(c x\right)^{2} c}{2 c^{2} x^{2}-2}+\right.$

[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)

[Out] -a/d/x*(-c^2*d*x^2+d)^(3/2)-a*c^2*x*(-c^2*d*x^2+d)^(1/2)-a*c^2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*c+2*I*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c-(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*arcsin(c*x)/x/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c)

Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^2}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{x^2}\,dx$$

[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")

[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^2, x)

Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^2}\,dx = \int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))}{x^2}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**2,x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**2, x)
```

Maxima [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^2}\,dx = \int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
[Out] b*sqrt(d)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1))/x^2, x) - (c*sqrt(d)*arcsin(c*x) + sqrt(-c^2*d*x^2 + d)/x)
*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{x^2}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^2,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^2, x)
```

3.59 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^4}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 111

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^4}\,dx = -\frac{bc\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{3dx^3} - \frac{bc^3\sqrt{d-c^2dx^2}\log(x)}{3\sqrt{1-c^2x^2}}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/d/x^3-1/6*b*c*(-c^2*d*x^2+d)^(1
/2)/x^2/(-c^2*x^2+1)^(1/2)-1/3*b*c^3*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1
)^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.074, Rules used = {4771, 14}

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^4}\,dx = -\frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{3dx^3} - \frac{bc\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}} - \frac{bc^3\log(x)\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/6*(b*c*Sqrt[d - c^2*d*x^2])/(x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(
3/2)*(a + b*ArcSin[c*x]))/(3*d*x^3) - (b*c^3*Sqrt[d - c^2*d*x^2]*Log[x])/(3
*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{3dx^3}+\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{1-c^2x^2}{x^3}\,dx}{3\sqrt{1-c^2x^2}}\\
&= -\frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{3dx^3}+\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\left(\frac{1}{x^3}-\frac{c^2}{x}\right)\,dx}{3\sqrt{1-c^2x^2}}\\
&= -\frac{bc\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{3dx^3}-\frac{bc^3\sqrt{d-c^2dx^2}\log(x)}{3\sqrt{1-c^2x^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.10

$$\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^4}\,dx=$$
$$-\frac{\sqrt{d-c^2dx^2}\left(bcx-3bc^3x^3+2a\sqrt{1-c^2x^2}-2ac^2x^2\sqrt{1-c^2x^2}+2b(1-c^2x^2)^{3/2}\arcsin(cx)+2bc^3x^3\log\right.}{6x^3\sqrt{1-c^2x^2}}$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/6*(Sqrt[d - c^2*d*x^2]*(b*c*x - 3*b*c^3*x^3 + 2*a*Sqrt[1 - c^2*x^2] - 2*
a*c^2*x^2*Sqrt[1 - c^2*x^2] + 2*b*(1 - c^2*x^2)^(3/2)*ArcSin[c*x] + 2*b*c^3
*x^3*Log[x]))/(x^3*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.17 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.42

method	result
default	$-\frac{a(-c^2dx^2+d)^{\frac{3}{2}}}{3dx^3}-\frac{b\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\left(2i\arcsin(cx)x^3c^3-2\ln\left(\left(icx+\sqrt{-c^2x^2+1}\right)^2-1\right)x^3c^3+2\sqrt{-c^2x^2+1}\,\arcsin(cx)x\right.}{6(c^2x^2-1)x^3}$
parts	$-\frac{a(-c^2dx^2+d)^{\frac{3}{2}}}{3dx^3}-\frac{b\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\left(2i\arcsin(cx)x^3c^3-2\ln\left(\left(icx+\sqrt{-c^2x^2+1}\right)^2-1\right)x^3c^3+2\sqrt{-c^2x^2+1}\,\arcsin(cx)x\right.}{6(c^2x^2-1)x^3}$

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*a/d/x^3*(-c^2*d*x^2+d)^(3/2)-1/6*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)
^(1/2)*(2*I*arcsin(c*x)*x^3*c^3-2*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*x^3*c^
3+2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)
-c*x)/(c^2*x^2-1)/x^3
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 199 vs. 2(95) = 190.

Time = 0.29 (sec) , antiderivative size = 414, normalized size of antiderivative = 3.73

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^4}\,dx$$

$$=\left[\frac{(bc^5x^5-bc^3x^3)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}(x^4-1)\sqrt{d}-d}{c^2x^4-x^2}\right)-\sqrt{-c^2dx^2+d}(bcx^3-bcx)\sqrt{-c^2x^2}}{6\,(c^2x^5-x^3)}\right.$$

$$-\frac{2\,(bc^5x^5-bc^3x^3)\sqrt{-d}\arctan\left(\frac{\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}(x^2+1)\sqrt{-d}}{c^2dx^4-(c^2+1)dx^2+d}\right)+\sqrt{-c^2dx^2+d}(bcx^3-bcx)\sqrt{-c^2x^2+1}-}{6\,(c^2x^5-x^3)}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] [1/6*((b*c^5*x^5 - b*c^3*x^3)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d*x^4 +
sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^4 - x
^2)) - sqrt(-c^2*d*x^2 + d)*(b*c*x^3 - b*c*x)*sqrt(-c^2*x^2 + 1) + 2*(a*c^4
*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c^2*x^2 + b)*arcsin(c*x) + a)*sqrt(-c
^2*d*x^2 + d))/(c^2*x^5 - x^3), -1/6*(2*(b*c^5*x^5 - b*c^3*x^3)*sqrt(-d)*ar
ctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4
- (c^2 + 1)*d*x^2 + d)) + sqrt(-c^2*d*x^2 + d)*(b*c*x^3 - b*c*x)*sqrt(-c^2*
x^2 + 1) - 2*(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c^2*x^2 + b)*arcsi
n(c*x) + a)*sqrt(-c^2*d*x^2 + d))/(c^2*x^5 - x^3)]
```

Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^4}\,dx = \int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))}{x^4}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**4,x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**4, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.23

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^4}\,dx = \frac{\left((-1)^{-2\,c^2dx^2+2\,d}\,c^2d^{\frac{3}{2}}\log\left(-2\,c^2d+\frac{2\,d}{x^2}\right)+c^2d^{\frac{3}{2}}\log\left(x^2-\frac{1}{c^2}\right)-\frac{\sqrt{c^4dx^4-2\,c^2dx^2+d}d}{x^2}\right)bc}{6\,d} - \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}b\arcsin\left(cx\right)}{3\,dx^3} - \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}a}{3\,dx^3}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
[Out] 1/6*((-1)^(-2*c^2*d*x^2 + 2*d)*c^2*d^(3/2)*log(-2*c^2*d + 2*d/x^2) + c^2*d^
(3/2)*log(x^2 - 1/c^2) - sqrt(c^4*d*x^4 - 2*c^2*d*x^2 + d)*d/x^2)*b*c/d - 1
/3*(-c^2*d*x^2 + d)^(3/2)*b*arcsin(c*x)/(d*x^3) - 1/3*(-c^2*d*x^2 + d)^(3/2
)*a/(d*x^3)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^4}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{x^4}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^4,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^4, x)
```

3.60 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^6}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 187

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^6}\,dx = -\frac{bc\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{5dx^5} - \frac{2c^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{15dx^3} - \frac{2bc^5\sqrt{d-c^2dx^2}\log(x)}{15\sqrt{1-c^2x^2}}$$

```
[Out] -1/5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/d/x^5-2/15*c^2*(-c^2*d*x^2+d)^(
3/2)*(a+b*arcsin(c*x))/d/x^3-1/20*b*c*(-c^2*d*x^2+d)^(1/2)/x^4/(-c^2*x^2+1)
^(1/2)+1/30*b*c^3*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)-2/15*b*c^5*ln
(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 187, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used

$= \{277, 270, 4779, 12, 14\}$

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^6}\,dx = -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{5dx^5} - \frac{2c^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{15dx^3} - \frac{bc\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}} - \frac{2bc^5\log(x)\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}}$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] -1/20*(b*c*Sqrt[d - c^2*d*x^2])/(x^4*Sqrt[1 - c^2*x^2]) + (b*c^3*Sqrt[d - c
^2*d*x^2])/(30*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSi
n[c*x]))/(5*d*x^5) - (2*c^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(15*
d*x^3) - (2*b*c^5*Sqrt[d - c^2*d*x^2]*Log[x])/(15*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
```

```
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{5dx^5} - \frac{2c^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{15dx^3} \\
&\quad - \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{-3+c^2x^2+2c^4x^4}{15x^5}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{5dx^5} - \frac{2c^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{15dx^3} \\
&\quad - \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{-3+c^2x^2+2c^4x^4}{x^5}\,dx}{15\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{5dx^5} - \frac{2c^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{15dx^3} \\
&\quad - \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \left(-\frac{3}{x^5}+\frac{c^2}{x^3}+\frac{2c^4}{x}\right)dx}{15\sqrt{1-c^2x^2}} \\
&= -\frac{bc\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{5dx^5} \\
&\quad - \frac{2c^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{15dx^3} - \frac{2bc^5\sqrt{d-c^2dx^2}\log(x)}{15\sqrt{1-c^2x^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 172, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^6}\,dx$$
$$= \frac{\sqrt{d-c^2dx^2}\left(-9bcx+6bc^3x^3+50bc^5x^5-36a\sqrt{1-c^2x^2}+12ac^2x^2\sqrt{1-c^2x^2}+24ac^4x^4\sqrt{1-c^2x^2}+12b\right.}{180x^5\sqrt{1-c^2x^2}}$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^6,x]
[Out] (Sqrt[d - c^2*d*x^2]*(-9*b*c*x + 6*b*c^3*x^3 + 50*b*c^5*x^5 - 36*a*Sqrt[1 -
 c^2*x^2] + 12*a*c^2*x^2*Sqrt[1 - c^2*x^2] + 24*a*c^4*x^4*Sqrt[1 - c^2*x^2]
 + 12*b*Sqrt[1 - c^2*x^2]*(-3 + c^2*x^2 + 2*c^4*x^4)*ArcSin[c*x] - 24*b*c^5
*x^5*Log[x]))/(180*x^5*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.22 (sec) , antiderivative size = 1903, normalized size of antiderivative = 10.18

method	result	size
default	Expression too large to display	1903
parts	Expression too large to display	1903

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^6,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)/(c^2*x^2-1
)*c^5*(-c^2*x^2+1)^(1/2)+9/5*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4
-15*c^2*x^2+9)/x^5/(c^2*x^2-1)*arcsin(c*x)+2/15*b*(-d*(c^2*x^2-1))^(1/2)*(-
c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^5+3/5*I*b
*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^3/(c^2*x^2-1)
*c^8-1/2*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^4/(
c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^9+12/5*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6
-5*c^4*x^4-15*c^2*x^2+9)/x/(c^2*x^2-1)*arcsin(c*x)*c^4-21/20*b*(-d*(c^2*x^2
-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)/x^2/(c^2*x^2-1)*c^3*(-c^2*x^
2+1)^(1/2)-27/5*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9
)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^2+9/20*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6
-5*c^4*x^4-15*c^2*x^2+9)/x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+2*b*(-d*(c^2*
x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^7/(c^2*x^2-1)*arcsin(c*
x)*c^12-5/3*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^
5/(c^2*x^2-1)*arcsin(c*x)*c^10-17/3*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*
c^4*x^4-15*c^2*x^2+9)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^8+11/12*b*(-d*(c^2*x^2-
1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^2/(c^2*x^2-1)*c^7*(-c^2*x^2
+1)^(1/2)+98/15*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9
)*x/(c^2*x^2-1)*arcsin(c*x)*c^6-3/10*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6
-5*c^4*x^4-15*c^2*x^2+9)*x/(c^2*x^2-1)*c^6-4*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c
^2*x^2+1)^(1/2)*arcsin(c*x)*c^5/(15*c^2*x^2-15)+2/15*I*b*(-d*(c^2*x^2-1))^(
1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^9/(c^2*x^2-1)*c^14-4/15*I*b*(-d*
(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^7/(c^2*x^2-1)*c^12
-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^5/(c^
2*x^2-1)*c^10-2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x
^2+9)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^9-2*I*b*(-d*(c^2*x^2
-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)
^(1/2)*arcsin(c*x)*c^7+2*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-1
5*c^2*x^2+9)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^11+a*(-1/5/d/
x^5*(-c^2*d*x^2+d)^(3/2)-2/15*c^2/d/x^3*(-c^2*d*x^2+d)^(3/2))-2/15*I*b*(-d*
(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^5/(c^2*x^2-1)*(-c^
2*x^2+1)*c^10+2/15*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*
x^2+9)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^12+3/10*I*b*(-d*(c^2*x^2-1))^(1/2)/(1
5*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^6-3/10*I*b*(
```

```
-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2*x^2+9)*x^3/(c^2*x^2-1)*(
-c^2*x^2+1)*c^8+6/5*I*b*(-d*(c^2*x^2-1))^(1/2)/(15*c^6*x^6-5*c^4*x^4-15*c^2
*x^2+9)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 501, normalized size of antiderivative = 2.68

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^6}\,dx$$

$$= \left[\frac{4\,(bc^7x^7 - bc^5x^5)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\,(x^4-1)\sqrt{d}-d}{c^2x^4-x^2}\right) - (2\,bc^3x^3 - (2\,bc^3-3\,bc)x^5 - 3}{}\right.$$

$$-\frac{8\,(bc^7x^7 - bc^5x^5)\sqrt{-d}\arctan\left(\frac{\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\,(x^2+1)\sqrt{-d}}{c^2dx^4-(c^2+1)dx^2+d}\right) + (2\,bc^3x^3 - (2\,bc^3-3\,bc)x^5 - 3\,bcx)\sqrt{-c}}{}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] [1/60*(4*(b*c^7*x^7 - b*c^5*x^5)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d*x^4
 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^4
- x^2)) - (2*b*c^3*x^3 - (2*b*c^3 - 3*b*c)*x^5 - 3*b*c*x)*sqrt(-c^2*d*x^2 +
 d)*sqrt(-c^2*x^2 + 1) + 4*(2*a*c^6*x^6 - a*c^4*x^4 - 4*a*c^2*x^2 + (2*b*c^
6*x^6 - b*c^4*x^4 - 4*b*c^2*x^2 + 3*b)*arcsin(c*x) + 3*a)*sqrt(-c^2*d*x^2 +
 d))/(c^2*x^7 - x^5), -1/60*(8*(b*c^7*x^7 - b*c^5*x^5)*sqrt(-d)*arctan(sqrt
(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 +
1)*d*x^2 + d)) + (2*b*c^3*x^3 - (2*b*c^3 - 3*b*c)*x^5 - 3*b*c*x)*sqrt(-c^2*
d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 4*(2*a*c^6*x^6 - a*c^4*x^4 - 4*a*c^2*x^2 +
(2*b*c^6*x^6 - b*c^4*x^4 - 4*b*c^2*x^2 + 3*b)*arcsin(c*x) + 3*a)*sqrt(-c^2*
d*x^2 + d))/(c^2*x^7 - x^5)]
```

Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^6}\,dx = \int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))}{x^6}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**6,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**6, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.75

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^6}\,dx$$
$$= -\frac{1}{60}\left(8\,c^4\sqrt{d}\log(x) - \frac{2\,c^2\sqrt{d}x^2 - 3\,\sqrt{d}}{x^4}\right)bc$$
$$- \frac{1}{15}\,b\left(\frac{2\,(-c^2dx^2+d)^{\frac{3}{2}}c^2}{dx^3} + \frac{3\,(-c^2dx^2+d)^{\frac{3}{2}}}{dx^5}\right)\arcsin(cx)$$
$$- \frac{1}{15}\,a\left(\frac{2\,(-c^2dx^2+d)^{\frac{3}{2}}c^2}{dx^3} + \frac{3\,(-c^2dx^2+d)^{\frac{3}{2}}}{dx^5}\right)$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="maxima")
```

```
[Out] -1/60*(8*c^4*sqrt(d)*log(x) - (2*c^2*sqrt(d)*x^2 - 3*sqrt(d))/x^4)*b*c - 1/
15*b*(2*(-c^2*d*x^2 + d)^(3/2)*c^2/(d*x^3) + 3*(-c^2*d*x^2 + d)^(3/2)/(d*x^
5))*arcsin(c*x) - 1/15*a*(2*(-c^2*d*x^2 + d)^(3/2)*c^2/(d*x^3) + 3*(-c^2*d*
x^2 + d)^(3/2)/(d*x^5))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^6}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^6}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{x^6}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^6,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^6, x)
```

3.61 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^8}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 263

$$\begin{aligned}\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^8}\,dx = & -\frac{bc\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-c^2dx^2}}{140x^4\sqrt{1-c^2x^2}} \\ & +\frac{2bc^5\sqrt{d-c^2dx^2}}{105x^2\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{7dx^7} \\ & -\frac{4c^2\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{35dx^5} \\ & -\frac{8c^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{105dx^3} \\ & -\frac{8bc^7\sqrt{d-c^2dx^2}\log(x)}{105\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] -1/7*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/d/x^7-4/35*c^2*(-c^2*d*x^2+d)^(
3/2)*(a+b*arcsin(c*x))/d/x^5-8/105*c^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x
))/d/x^3-1/42*b*c*(-c^2*d*x^2+d)^(1/2)/x^6/(-c^2*x^2+1)^(1/2)+1/140*b*c^3*(
-c^2*d*x^2+d)^(1/2)/x^4/(-c^2*x^2+1)^(1/2)+2/105*b*c^5*(-c^2*d*x^2+d)^(1/2)
/x^2/(-c^2*x^2+1)^(1/2)-8/105*b*c^7*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)
^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {277, 270, 4779, 12, 14}

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^8}\,dx = -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{7dx^7} - \frac{4c^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{35dx^5} - \frac{8c^4(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{105dx^3} - \frac{bc\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}} - \frac{8bc^7\log(x)\sqrt{d-c^2dx^2}}{105\sqrt{1-c^2x^2}} + \frac{2bc^5\sqrt{d-c^2dx^2}}{105x^2\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{140x^4\sqrt{1-c^2x^2}}$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] -1/42*(b*c*Sqrt[d - c^2*d*x^2])/(x^6*Sqrt[1 - c^2*x^2]) + (b*c^3*Sqrt[d - c
^2*d*x^2])/(140*x^4*Sqrt[1 - c^2*x^2]) + (2*b*c^5*Sqrt[d - c^2*d*x^2])/(105
*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(7*d*
x^7) - (4*c^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(35*d*x^5) - (8*c^
4*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(105*d*x^3) - (8*b*c^7*Sqrt[d
- c^2*d*x^2]*Log[x])/(105*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
```

```
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{7dx^7}-\frac{4c^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{35dx^5} \\
&\quad-\frac{8c^4(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{105dx^3}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-15+3c^2x^2+4c^4x^4+8c^6x^6}{105x^7}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{7dx^7}-\frac{4c^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{35dx^5} \\
&\quad-\frac{8c^4(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{105dx^3}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-15+3c^2x^2+4c^4x^4+8c^6x^6}{x^7}\,dx}{105\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{7dx^7}-\frac{4c^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{35dx^5} \\
&\quad-\frac{8c^4(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{105dx^3}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\left(-\frac{15}{x^7}+\frac{3c^2}{x^5}+\frac{4c^4}{x^3}+\frac{8c^6}{x}\right)dx}{105\sqrt{1-c^2x^2}} \\
&= -\frac{bc\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-c^2dx^2}}{140x^4\sqrt{1-c^2x^2}}+\frac{2bc^5\sqrt{d-c^2dx^2}}{105x^2\sqrt{1-c^2x^2}} \\
&\quad-\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{7dx^7}-\frac{4c^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{35dx^5} \\
&\quad-\frac{8c^4(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{105dx^3}-\frac{8bc^7\sqrt{d-c^2dx^2}\log(x)}{105\sqrt{1-c^2x^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.25 (sec) , antiderivative size = 213, normalized size of antiderivative = 0.81

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^8}\,dx$$
$$=\frac{\sqrt{d-c^2dx^2}\left(-50bcx+15bc^3x^3+40bc^5x^5+392bc^7x^7-300a\sqrt{1-c^2x^2}+60ac^2x^2\sqrt{1-c^2x^2}+80ac^4x^4\sqrt{\right.}{2100x^7}$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(-50*b*c*x + 15*b*c^3*x^3 + 40*b*c^5*x^5 + 392*b*c^7*x
^7 - 300*a*Sqrt[1 - c^2*x^2] + 60*a*c^2*x^2*Sqrt[1 - c^2*x^2] + 80*a*c^4*x^
4*Sqrt[1 - c^2*x^2] + 160*a*c^6*x^6*Sqrt[1 - c^2*x^2] + 20*b*Sqrt[1 - c^2*x
^2]*(-15 + 3*c^2*x^2 + 4*c^4*x^4 + 8*c^6*x^6)*ArcSin[c*x] - 160*b*c^7*x^7*L
og[x]))/(2100*x^7*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.25 (sec) , antiderivative size = 2751, normalized size of antiderivative = 10.46

method	result	size
default	Expression too large to display	2751
parts	Expression too large to display	2751

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^8,x,method=_RETURNVERBOSE)
```

```
[Out] 225/7*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*
x^2+225)/x^7/(c^2*x^2-1)*arcsin(c*x)+73/20*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^
8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)/(c^2*x^2-1)*c^7*(-c^2*x^2+1)^
(1/2)+8/105*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c
*x+(-c^2*x^2+1)^(1/2))^2-1)*c^7-8*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-1
05*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*a
rcsin(c*x)*c^13-8/5*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*
c^4*x^4-315*c^2*x^2+225)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^1
1-24*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2
*x^2+225)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^9+64/3*I*b*(-d*(
c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^8/
(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^15-302/105*I*b*(-d*(c^2*x^2-1)
)^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^5/(c^2*x^2-1
)*(-c^2*x^2+1)*c^12+a*(-1/7/d/x^7*(-c^2*d*x^2+d)^(3/2)+4/7*c^2*(-1/5/d/x^5*
(-c^2*d*x^2+d)^(3/2)-2/15*c^2/d/x^3*(-c^2*d*x^2+d)^(3/2)))+64/3*b*(-d*(c^2*
x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^9/(c^2
```

```
*x^2-1)*arcsin(c*x)*c^16-56/3*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6
*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^7/(c^2*x^2-1)*arcsin(c*x)*c^14-16/3*b*(-
d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x
^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^13-4/15*b*(-d*(c^2*x^2-1))^(1/2)/(280*c
^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^5/(c^2*x^2-1)*arcsin(c*x)*
c^12-351/5*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315
*c^2*x^2+225)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^10+469/60*b*(-d*(c^2*x^2-1))^(1
/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^2/(c^2*x^2-1)*c^
9*(-c^2*x^2+1)^(1/2)+3057/35*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*
x^6-21*c^4*x^4-315*c^2*x^2+225)*x/(c^2*x^2-1)*arcsin(c*x)*c^8-594/35*b*(-d*
(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)/x/(
c^2*x^2-1)*arcsin(c*x)*c^6-71/28*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*
c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)/x^2/(c^2*x^2-1)*c^5*(-c^2*x^2+1)^(1/2)+
342/7*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*
x^2+225)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^4-255/28*b*(-d*(c^2*x^2-1))^(1/2)/(2
80*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)/x^4/(c^2*x^2-1)*c^3*(-c^
2*x^2+1)^(1/2)-585/7*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c
^4*x^4-315*c^2*x^2+225)/x^5/(c^2*x^2-1)*arcsin(c*x)*c^2+75/14*b*(-d*(c^2*x^
2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)/x^6/(c^2*x
^2-1)*(-c^2*x^2+1)^(1/2)*c-16*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
*arcsin(c*x)*c^7/(105*c^2*x^2-105)+128/105*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*
c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^13/(c^2*x^2-1)*c^20-16/10
5*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^
2+225)*x^11/(c^2*x^2-1)*c^18-40/21*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-
105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^9/(c^2*x^2-1)*c^16-214/105*I*b*(-
d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x
^7/(c^2*x^2-1)*c^14+152/105*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6
*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^5/(c^2*x^2-1)*c^12+30/7*I*b*(-d*(c^2*x^2
-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^3/(c^2*x^
2-1)*c^10-20/7*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x
^4-315*c^2*x^2+225)*x/(c^2*x^2-1)*c^8-10/7*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*
c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^3/(c^2*x^2-1)*(-c^2*x^2+1
)*c^10+20/7*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-
315*c^2*x^2+225)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^8+128/105*I*b*(-d*(c^2*x^2-1)
)^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)*x^11/(c^2*x^2-
1)*(-c^2*x^2+1)*c^18+16/15*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*
x^6-21*c^4*x^4-315*c^2*x^2+225)*x^9/(c^2*x^2-1)*(-c^2*x^2+1)*c^16-88/105*I*
b*(-d*(c^2*x^2-1))^(1/2)/(280*c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+22
5)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^14+120/7*I*b*(-d*(c^2*x^2-1))^(1/2)/(280*
c^8*x^8-105*c^6*x^6-21*c^4*x^4-315*c^2*x^2+225)/(c^2*x^2-1)*(-c^2*x^2+1)^(1
/2)*arcsin(c*x)*c^7
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 567, normalized size of antiderivative = 2.16

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^8}\,dx$$
$$=\left[\frac{16\,(bc^9x^9-bc^7x^7)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\,(x^4-1)\sqrt{d}-d}{c^2x^4-x^2}\right)-(8\,bc^5x^5-(8\,bc^5+3\,bc^3-10\right.$$
$$-\frac{32\,(bc^9x^9-bc^7x^7)\sqrt{-d}\arctan\left(\frac{\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\,(x^2+1)\sqrt{-d}}{c^2dx^4-(c^2+1)dx^2+d}\right)+(8\,bc^5x^5-(8\,bc^5+3\,bc^3-10\,bc)x^7+3}{}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="fricas")
```

```
[Out] [1/420*(16*(b*c^9*x^9 - b*c^7*x^7)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d*x
^4 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^
4 - x^2)) - (8*b*c^5*x^5 - (8*b*c^5 + 3*b*c^3 - 10*b*c)*x^7 + 3*b*c^3*x^3 -
 10*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 4*(8*a*c^8*x^8 - 4*a*c
^6*x^6 - a*c^4*x^4 - 18*a*c^2*x^2 + (8*b*c^8*x^8 - 4*b*c^6*x^6 - b*c^4*x^4
- 18*b*c^2*x^2 + 15*b)*arcsin(c*x) + 15*a)*sqrt(-c^2*d*x^2 + d))/(c^2*x^9 -
 x^7), -1/420*(32*(b*c^9*x^9 - b*c^7*x^7)*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 +
 d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)
) + (8*b*c^5*x^5 - (8*b*c^5 + 3*b*c^3 - 10*b*c)*x^7 + 3*b*c^3*x^3 - 10*b*c*
x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 4*(8*a*c^8*x^8 - 4*a*c^6*x^6 -
 a*c^4*x^4 - 18*a*c^2*x^2 + (8*b*c^8*x^8 - 4*b*c^6*x^6 - b*c^4*x^4 - 18*b*c
^2*x^2 + 15*b)*arcsin(c*x) + 15*a)*sqrt(-c^2*d*x^2 + d))/(c^2*x^9 - x^7)]
```

Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^8}\,dx=\int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))}{x^8}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**8,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**8, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 199, normalized size of antiderivative = 0.76

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^8}\,dx$$
$$= -\frac{1}{420}\left(32\,c^6\sqrt{d}\log(x) - \frac{8\,c^4\sqrt{d}x^4 + 3\,c^2\sqrt{d}x^2 - 10\,\sqrt{d}}{x^6}\right)bc$$
$$- \frac{1}{105}\left(\frac{8\,(-c^2dx^2+d)^{\frac{3}{2}}c^4}{dx^3} + \frac{12\,(-c^2dx^2+d)^{\frac{3}{2}}c^2}{dx^5} + \frac{15\,(-c^2dx^2+d)^{\frac{3}{2}}}{dx^7}\right)b\arcsin(cx)$$
$$- \frac{1}{105}\left(\frac{8\,(-c^2dx^2+d)^{\frac{3}{2}}c^4}{dx^3} + \frac{12\,(-c^2dx^2+d)^{\frac{3}{2}}c^2}{dx^5} + \frac{15\,(-c^2dx^2+d)^{\frac{3}{2}}}{dx^7}\right)a$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="maxima")
```

```
[Out] -1/420*(32*c^6*sqrt(d)*log(x) - (8*c^4*sqrt(d)*x^4 + 3*c^2*sqrt(d)*x^2 - 10
*sqrt(d))/x^6)*b*c - 1/105*(8*(-c^2*d*x^2 + d)^(3/2)*c^4/(d*x^3) + 12*(-c^2
*d*x^2 + d)^(3/2)*c^2/(d*x^5) + 15*(-c^2*d*x^2 + d)^(3/2)/(d*x^7))*b*arcsin
(c*x) - 1/105*(8*(-c^2*d*x^2 + d)^(3/2)*c^4/(d*x^3) + 12*(-c^2*d*x^2 + d)^(
3/2)*c^2/(d*x^5) + 15*(-c^2*d*x^2 + d)^(3/2)/(d*x^7))*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^8}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^8}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{x^8}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^8,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^8, x)
```

3.62 $\int x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 256

$$\int x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\frac{8bx\sqrt{d-c^2dx^2}}{105c^5\sqrt{1-c^2x^2}}+\frac{4bx^3\sqrt{d-c^2dx^2}}{315c^3\sqrt{1-c^2x^2}}+\frac{bx^5\sqrt{d-c^2dx^2}}{175c\sqrt{1-c^2x^2}}-\frac{bcx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^6d}+\frac{2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^6d^2}-\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^6d^3}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/c^6/d+2/5*(-c^2*d*x^2+d)^(5/2)*
(a+b*arcsin(c*x))/c^6/d^2-1/7*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/c^6/d^
3+8/105*b*x*(-c^2*d*x^2+d)^(1/2)/c^5/(-c^2*x^2+1)^(1/2)+4/315*b*x^3*(-c^2*d
*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/175*b*x^5*(-c^2*d*x^2+d)^(1/2)/c/(-c
^2*x^2+1)^(1/2)-1/49*b*c*x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 256, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used

= {272, 45, 4779, 12}

$$\int x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = -\frac{\left(d-c^2dx^2\right)^{7/2}(a+b\arcsin(cx))}{7c^6d^3} + \frac{2\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{5c^6d^2} - \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{3c^6d} - \frac{bcx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} + \frac{bx^5\sqrt{d-c^2dx^2}}{175c\sqrt{1-c^2x^2}} + \frac{8bx\sqrt{d-c^2dx^2}}{105c^5\sqrt{1-c^2x^2}} + \frac{4bx^3\sqrt{d-c^2dx^2}}{315c^3\sqrt{1-c^2x^2}}$$

```
[In] Int[x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*x*Sqrt[d - c^2*d*x^2])/(105*c^5*Sqrt[1 - c^2*x^2]) + (4*b*x^3*Sqrt[d -
 c^2*d*x^2])/(315*c^3*Sqrt[1 - c^2*x^2]) + (b*x^5*Sqrt[d - c^2*d*x^2])/(175
*c*Sqrt[1 - c^2*x^2]) - (b*c*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[1 - c^2*x^2]
) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c^6*d) + (2*(d - c^2*d*x
^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^6*d^2) - ((d - c^2*d*x^2)^(7/2)*(a + b*
ArcSin[c*x]))/(7*c^6*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
```

```
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^6d}+\frac{2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^6d^2} \\
&\quad -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^6d^3}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-8-4c^2x^2-3c^4x^4+15c^6x^6}{105c^6}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^6d}+\frac{2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^6d^2} \\
&\quad -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^6d^3} \\
&\quad -\frac{\left(b\sqrt{d-c^2dx^2}\right)\int\left(-8-4c^2x^2-3c^4x^4+15c^6x^6\right)\,dx}{105c^5\sqrt{1-c^2x^2}} \\
&= \frac{8bx\sqrt{d-c^2dx^2}}{105c^5\sqrt{1-c^2x^2}}+\frac{4bx^3\sqrt{d-c^2dx^2}}{315c^3\sqrt{1-c^2x^2}}+\frac{bx^5\sqrt{d-c^2dx^2}}{175c\sqrt{1-c^2x^2}} \\
&\quad -\frac{bcx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^6d} \\
&\quad +\frac{2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^6d^2}-\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^6d^3}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 157, normalized size of antiderivative = 0.61

$$\int x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{\sqrt{d-c^2dx^2}\left(bcx(840+140c^2x^2+63c^4x^4-225c^6x^6)+105a\sqrt{1-c^2x^2}(-8-4c^2x^2-3c^4x^4+15c^6x^6)+10\right.}{11025c^6\sqrt{1-c^2x^2}}$$

```
[In] Integrate[x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(b*c*x*(840 + 140*c^2*x^2 + 63*c^4*x^4 - 225*c^6*x^6)
+ 105*a*Sqrt[1 - c^2*x^2]*(-8 - 4*c^2*x^2 - 3*c^4*x^4 + 15*c^6*x^6) + 105*b
*Sqrt[1 - c^2*x^2]*(-8 - 4*c^2*x^2 - 3*c^4*x^4 + 15*c^6*x^6)*ArcSin[c*x]))/
(11025*c^6*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.24 (sec) , antiderivative size = 880, normalized size of antiderivative = 3.44

method	result
default	$a\left(-\frac{x^4(-c^2dx^2+d)^{\frac{3}{2}}}{7c^2d}+\frac{-\frac{4x^2(-c^2dx^2+d)^{\frac{3}{2}}}{35c^2d}-\frac{8(-c^2dx^2+d)^{\frac{3}{2}}}{105dc^4}}{c^2}\right)+b\left(\frac{\sqrt{-d(c^2x^2-1)}\,(64c^8x^8-144c^6x^6-64ic^7x^7\sqrt{-c^2x^2+}}{}\right.$
parts	$a\left(-\frac{x^4(-c^2dx^2+d)^{\frac{3}{2}}}{7c^2d}+\frac{-\frac{4x^2(-c^2dx^2+d)^{\frac{3}{2}}}{35c^2d}-\frac{8(-c^2dx^2+d)^{\frac{3}{2}}}{105dc^4}}{c^2}\right)+b\left(\frac{\sqrt{-d(c^2x^2-1)}\,(64c^8x^8-144c^6x^6-64ic^7x^7\sqrt{-c^2x^2+}}{}\right.$

```
[In] int(x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/7*x^4*(-c^2*d*x^2+d)^(3/2)/c^2/d+4/7/c^2*(-1/5*x^2*(-c^2*d*x^2+d)^(3/
2)/c^2/d-2/15/d/c^4*(-c^2*d*x^2+d)^(3/2)))+b*(1/6272*(-d*(c^2*x^2-1))^(1/2)
*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*
(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(
-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))/c^6/(c^2*x^2-1)+3/3200*(-d*(c^2*
x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2
*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arc
sin(c*x))/c^6/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2
+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^6/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/
2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^6/(c^2*x^2-1)+1/1
152*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-
c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))/c^6/(c^2*x^2-1)+1/6272
*(-d*(c^2*x^2-1))^(1/2)*(64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+64*c^8*x^8-112*I*(
-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c
^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arcsin(c*x))/c^6/(c^2
*x^2-1)+1/7200*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*
(-13*I+15*arcsin(c*x))*cos(4*arcsin(c*x))/c^6/(c^2*x^2-1)-1/14400*(-d*(c^2*
x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(-I+105*arcsin(c*x))*sin
(4*arcsin(c*x))/c^6/(c^2*x^2-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 177, normalized size of antiderivative = 0.69

$$\int x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$

$$=\frac{(225\,bc^7x^7-63\,bc^5x^5-140\,bc^3x^3-840\,bcx)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+105\,(15\,ac^8x^8-18\,ac^6x^6-ac^4x}{11025\,(c^8x^2-c^6}$$

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/11025*((225*b*c^7*x^7 - 63*b*c^5*x^5 - 140*b*c^3*x^3 - 840*b*c*x)*sqrt(-c
^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 105*(15*a*c^8*x^8 - 18*a*c^6*x^6 - a*c^4
*x^4 - 4*a*c^2*x^2 + (15*b*c^8*x^8 - 18*b*c^6*x^6 - b*c^4*x^4 - 4*b*c^2*x^2
 + 8*b)*arcsin(c*x) + 8*a)*sqrt(-c^2*d*x^2 + d))/(c^8*x^2 - c^6)
```

Sympy [F]

$$\int x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int x^5\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(a+b\,\mathrm{asin}\left(cx\right)\right)\,dx$$

```
[In] integrate(x**5*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**5*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 197, normalized size of antiderivative = 0.77

$$\begin{aligned}\int x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx\\ =-\frac{1}{105}\left(\frac{15\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^4}{c^2d}+\frac{12\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^2}{c^4d}+\frac{8\left(-c^2dx^2+d\right)^{\frac{3}{2}}}{c^6d}\right)b\arcsin\left(cx\right)\\ -\frac{1}{105}\left(\frac{15\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^4}{c^2d}+\frac{12\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^2}{c^4d}+\frac{8\left(-c^2dx^2+d\right)^{\frac{3}{2}}}{c^6d}\right)a\\ -\frac{\left(225\,c^6\sqrt{d}x^7-63\,c^4\sqrt{d}x^5-140\,c^2\sqrt{d}x^3-840\,\sqrt{d}x\right)b}{11025\,c^5}\end{aligned}$$

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/105*(15*(-c^2*d*x^2 + d)^(3/2)*x^4/(c^2*d) + 12*(-c^2*d*x^2 + d)^(3/2)*x
^2/(c^4*d) + 8*(-c^2*d*x^2 + d)^(3/2)/(c^6*d))*b*arcsin(c*x) - 1/105*(15*(-
c^2*d*x^2 + d)^(3/2)*x^4/(c^2*d) + 12*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^4*d) +
8*(-c^2*d*x^2 + d)^(3/2)/(c^6*d))*a - 1/11025*(225*c^6*sqrt(d)*x^7 - 63*c^4
*sqrt(d)*x^5 - 140*c^2*sqrt(d)*x^3 - 840*sqrt(d)*x)*b/c^5
```

Giac [F(-2)]

Exception generated.

$$\int x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int x^5\,(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int(x^5*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(x^5*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.63 $\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 183

$$\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\frac{2bx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}+\frac{bx^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}}-\frac{bcx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{3c^4d}+\frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{5c^4d^2}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/c^4/d+1/5*(-c^2*d*x^2+d)^(5/2)*
(a+b*arcsin(c*x))/c^4/d^2+2/15*b*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1
/2)+1/45*b*x^3*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/25*b*c*x^5*(-c^2
*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {272, 45, 4779, 12}

$$\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{5c^4d^2}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{3c^4d}-\frac{bcx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+\frac{bx^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}}+\frac{2bx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}$$

```
[In] Int[x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*x*Sqrt[d - c^2*d*x^2])/(15*c^3*Sqrt[1 - c^2*x^2]) + (b*x^3*Sqrt[d - c^
2*d*x^2])/(45*c*Sqrt[1 - c^2*x^2]) - (b*c*x^5*Sqrt[d - c^2*d*x^2])/(25*Sqrt
[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c^4*d) + ((
d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^4*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{3c^4d}+\frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{5c^4d^2} \\
&\quad -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-2-c^2x^2+3c^4x^4}{15c^4}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{3c^4d}+\frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{5c^4d^2} \\
&\quad -\frac{\left(b\sqrt{d-c^2dx^2}\right)\int\left(-2-c^2x^2+3c^4x^4\right)\,dx}{15c^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{2bx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}} + \frac{bx^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}} - \frac{bcx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^4d} + \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^4d^2}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 134, normalized size of antiderivative = 0.73

$$\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{\sqrt{d-c^2dx^2}\left(15a\sqrt{1-c^2x^2}(-2-c^2x^2+3c^4x^4)+b(30cx+5c^3x^3-9c^5x^5)+15b\sqrt{1-c^2x^2}(-2-c^2x^2+3\right.}{225c^4\sqrt{1-c^2x^2}}$$

```
[In] Integrate[x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
[Out] (Sqrt[d - c^2*d*x^2]*(15*a*Sqrt[1 - c^2*x^2]*(-2 - c^2*x^2 + 3*c^4*x^4) + b
*(30*c*x + 5*c^3*x^3 - 9*c^5*x^5) + 15*b*Sqrt[1 - c^2*x^2]*(-2 - c^2*x^2 +
3*c^4*x^4)*ArcSin[c*x]))/(225*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.36 (sec) , antiderivative size = 544, normalized size of antiderivative = 2.97

method	result
default	$a\left(-\frac{x^2(-c^2dx^2+d)^{\frac{3}{2}}}{5c^2d}-\frac{2(-c^2dx^2+d)^{\frac{3}{2}}}{15dc^4}\right)+b\left(\frac{\sqrt{-d(c^2x^2-1)}\left(16c^6x^6-28c^4x^4-16i\sqrt{-c^2x^2+1}\,x^5c^5+13c^2x^2+20i\sqrt{-c^2x^2+\right.}{800c^4(c^2x^2-1)}\right.$
parts	$a\left(-\frac{x^2(-c^2dx^2+d)^{\frac{3}{2}}}{5c^2d}-\frac{2(-c^2dx^2+d)^{\frac{3}{2}}}{15dc^4}\right)+b\left(\frac{\sqrt{-d(c^2x^2-1)}\left(16c^6x^6-28c^4x^4-16i\sqrt{-c^2x^2+1}\,x^5c^5+13c^2x^2+20i\sqrt{-c^2x^2+\right.}{800c^4(c^2x^2-1)}\right.$

```
[In] int(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] a*(-1/5*x^2*(-c^2*d*x^2+d)^(3/2)/c^2/d-2/15/d/c^4*(-c^2*d*x^2+d)^(3/2))+b*(
1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)
*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*
x*c-1)*(I+5*arcsin(c*x))/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x
^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^4/(c^2*x^2-1)-1/16*(-d*(c^
2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^4/(c
^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^
4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))/c^4/(c^2*x
^2-1)-1/3600*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(1
7*I+15*arcsin(c*x))*cos(4*arcsin(c*x))/c^4/(c^2*x^2-1)-1/900*(-d*(c^2*x^2-1
```

```
))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(2*I+15*arcsin(c*x))*sin(4*ar
csin(c*x))/c^4/(c^2*x^2-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 150, normalized size of antiderivative = 0.82

$$\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$=\frac{(9\,bc^5x^5-5\,bc^3x^3-30\,bcx)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+15\,(3\,ac^6x^6-4\,ac^4x^4-ac^2x^2+(3\,bc^6x^6-4\,bc^4x}{225\,(c^6x^2-c^4)}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] 1/225*((9*b*c^5*x^5 - 5*b*c^3*x^3 - 30*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^
2*x^2 + 1) + 15*(3*a*c^6*x^6 - 4*a*c^4*x^4 - a*c^2*x^2 + (3*b*c^6*x^6 - 4*b
*c^4*x^4 - b*c^2*x^2 + 2*b)*arcsin(c*x) + 2*a)*sqrt(-c^2*d*x^2 + d))/(c^6*x
^2 - c^4)
```

Sympy [F]

$$\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int x^3\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))\;dx$$

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
[Out] Integral(x**3*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.75

$$\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$=-\frac{1}{15}\,b\left(\frac{3\,(-c^2dx^2+d)^{\frac{3}{2}}x^2}{c^2d}+\frac{2\,(-c^2dx^2+d)^{\frac{3}{2}}}{c^4d}\right)\arcsin\,(cx)$$
$$-\frac{1}{15}\,a\left(\frac{3\,(-c^2dx^2+d)^{\frac{3}{2}}x^2}{c^2d}+\frac{2\,(-c^2dx^2+d)^{\frac{3}{2}}}{c^4d}\right)-\frac{\left(9\,c^4\sqrt{d}x^5-5\,c^2\sqrt{d}x^3-30\,\sqrt{d}x\right)b}{225\,c^3}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/15*b*(3*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(3/2)/(c
^4*d))*arcsin(c*x) - 1/15*a*(3*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^2*d) + 2*(-c^2
*d*x^2 + d)^(3/2)/(c^4*d)) - 1/225*(9*c^4*sqrt(d)*x^5 - 5*c^2*sqrt(d)*x^3 -
 30*sqrt(d)*x)*b/c^3
```

Giac [F(-2)]

Exception generated.

$$\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.64 $\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 110

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\frac{bx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}-\frac{bcx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^2d}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/c^2/d+1/3*b*x*(-c^2*d*x^2+d)^(1
/2)/c/(-c^2*x^2+1)^(1/2)-1/9*b*c*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2
)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {4767}

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=-\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^2d}+\frac{bx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}-\frac{bcx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}$$

```
[In] Int[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*x*Sqrt[d - c^2*d*x^2])/(3*c*Sqrt[1 - c^2*x^2]) - (b*c*x^3*Sqrt[d - c^2*d
*x^2])/(9*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/
(3*c^2*d)
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^2d}+\frac{\left(b\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)\,dx}{3c\sqrt{1-c^2x^2}}\\ &= \frac{bx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}-\frac{bcx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^2d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 70, normalized size of antiderivative = 0.64

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{\sqrt{d-c^2dx^2}\left(\frac{bc\left(x-\frac{c^2x^3}{3}\right)}{\sqrt{1-c^2x^2}}+(-1+c^2x^2)(a+b\arcsin(cx))\right)}{3c^2}$$

```
[In] Integrate[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
[Out] (Sqrt[d - c^2*d*x^2]*((b*c*(x - (c^2*x^3)/3))/Sqrt[1 - c^2*x^2] + (-1 + c^2
*x^2)*(a + b*ArcSin[c*x])))/(3*c^2)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.12 (sec) , antiderivative size = 343, normalized size of antiderivative = 3.12

method	result
default	$-\frac{a(-c^2dx^2+d)^{\frac{3}{2}}}{3c^2d}+b\left(\frac{\sqrt{-d(c^2x^2-1)}\left(4c^4x^4-5c^2x^2-4i\sqrt{-c^2x^2+1}\,x^3c^3+3icx\sqrt{-c^2x^2+1}+1\right)(i+3\arcsin(cx))}{72c^2(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-}{}\right.$
parts	$-\frac{a(-c^2dx^2+d)^{\frac{3}{2}}}{3c^2d}+b\left(\frac{\sqrt{-d(c^2x^2-1)}\left(4c^4x^4-5c^2x^2-4i\sqrt{-c^2x^2+1}\,x^3c^3+3icx\sqrt{-c^2x^2+1}+1\right)(i+3\arcsin(cx))}{72c^2(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-}{}\right.$

```
[In] int(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*a*(-c^2*d*x^2+d)^(3/2)/c^2/d+b*(1/72*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4
-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+
3*arcsin(c*x))/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*
x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1
/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^2/(c^2*x^2-1)+1/
72*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c
^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))/c^2/(c^2*x^2-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.05

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{(bc^3x^3-3\,bcx)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+3\left(ac^4x^4-2\,ac^2x^2+(bc^4x^4-2\,bc^2x^2+b)\arcsin(cx)+a\right)\sqrt{-}}{9\,(c^4x^2-c^2)}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/9*((b*c^3*x^3 - 3*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 3*(a*c
^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c^2*x^2 + b)*arcsin(c*x) + a)*sqrt(
-c^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F]

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int x\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))\;dx$$

```
[In] integrate(x*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(x*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.68

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = -\frac{(-c^2dx^2+d)^{\frac{3}{2}}b\arcsin(cx)}{3\,c^2d} - \frac{\left(c^2d^{\frac{3}{2}}x^3-3\,d^{\frac{3}{2}}x\right)b}{9\,cd} - \frac{(-c^2dx^2+d)^{\frac{3}{2}}a}{3\,c^2d}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] -1/3*(-c^2*d*x^2 + d)^(3/2)*b*arcsin(c*x)/(c^2*d) - 1/9*(c^2*d^(3/2)*x^3 -
3*d^(3/2)*x)*b/(c*d) - 1/3*(-c^2*d*x^2 + d)^(3/2)*a/(c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int x\,(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
[Out] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.65 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 203

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}\,dx = -\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{ib\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{ib\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

```
[Out] (-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))-b*c*x*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2
+1)^(1/2)-2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2
+d)^(1/2)/(-c^2*x^2+1)^(1/2)+I*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2
*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*
(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used

$= \{4783, 4803, 4268, 2317, 2438, 8\}$

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}\,dx = -\frac{2\sqrt{d-c^2dx^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{ib\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{ib\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -((b*c*x*Sqrt[d - c^2*d*x^2])/Sqrt[1 - c^2*x^2]) + Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]) - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*A
rcSin[c*x])])/Sqrt[1 - c^2*x^2] + (I*b*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I
*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(
I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
```

```
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad+\frac{\sqrt{d-c^2dx^2}\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int 1\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad+\frac{\sqrt{d-c^2dx^2}\text{Subst}\left(\int(a+bx)\csc(x)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} \\
&= -\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad-\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(b\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(b\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} \\
&= -\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad-\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(ib\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(ib\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{bcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{ib\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{ib\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 187, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}\,dx = a\sqrt{d-c^2dx^2} + a\sqrt{d}\log(x) - a\sqrt{d}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right) + \frac{b\sqrt{d-c^2dx^2}\left(-cx+\sqrt{1-c^2x^2}\arcsin(cx)+\arcsin(cx)\log\left(1-e^{i\arcsin(cx)}\right)-\arcsin(cx)\log\left(1+e^{i\arcsin(cx)}\right)\right.}{\sqrt{1-c^2x^2}}$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] a*Sqrt[d - c^2*d*x^2] + a*Sqrt[d]*Log[x] - a*Sqrt[d]*Log[d + Sqrt[d]*Sqrt[d
 - c^2*d*x^2]] + (b*Sqrt[d - c^2*d*x^2]*(-(c*x) + Sqrt[1 - c^2*x^2]*ArcSin[
c*x] + ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]*Log[1 + E^(I*Ar
cSin[c*x])] + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E^(I*ArcSin[c
*x])]))/Sqrt[1 - c^2*x^2]
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 314, normalized size of antiderivative = 1.55

method	result
default	$-\sqrt{d}\,\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2d\,x^2+d}}{x}\right)a+\sqrt{-c^2d\,x^2+d}\,a+b\left(\frac{\sqrt{-d(c^2x^2-1)}\,\left(c^2x^2-icx\sqrt{-c^2x^2+1}-1\right)(\arcsin(cx)+i)}{2c^2x^2-2}+\right.$
parts	$-\sqrt{d}\,\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2d\,x^2+d}}{x}\right)a+\sqrt{-c^2d\,x^2+d}\,a+b\left(\frac{\sqrt{-d(c^2x^2-1)}\,\left(c^2x^2-icx\sqrt{-c^2x^2+1}-1\right)(\arcsin(cx)+i)}{2c^2x^2-2}+\right.$

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] -d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)*a+(-c^2*d*x^2+d)^(1/2)*
a+b*(1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsi
n(c*x)+I)/(c^2*x^2-1)+1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+
c^2*x^2-1)*(arcsin(c*x)-I)/(c^2*x^2-1)-I*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)/(c^2*x^2-1)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*arcsin(
```

```
c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+pol
ylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}\,dx = \int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x, x)
```

Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}\,dx = \int \frac{\sqrt{-d(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))}{x}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x,x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x, x)
```

Maxima [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}\,dx = \int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
[Out] b*sqrt(d)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1))/x, x) - (sqrt(d)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x)
 + 2*d/abs(x)) - sqrt(-c^2*d*x^2 + d))*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x, x)
```

3.66 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^3}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 225

$$\begin{aligned}\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^3}\,dx = & -\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2x^2}\\ & +\frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}\\ & -\frac{ibc^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}}\\ & +\frac{ibc^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] -1/2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^2-1/2*b*c*(-c^2*d*x^2+d)^(1/2
)/x/(-c^2*x^2+1)^(1/2)+c^2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/
2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/2*I*b*c^2*polylog(2,-I*c*x-(-
c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/2*I*b*c^2*polyl
og(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 225, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used

$= \{4781, 30, 4803, 4268, 2317, 2438\}$

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^3}\,dx = \frac{c^2\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2x^2} - \frac{ibc^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}} + \frac{ibc^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}} - \frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(b*c*Sqrt[d - c^2*d*x^2])/(x*Sqrt[1 - c^2*x^2]) - (Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x]))/(2*x^2) + (c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]
)*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((I/2)*b*c^2*Sqrt[d - c^2
*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + ((I/2)*b*c^2*Sq
rt[d - c^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2x^2}+\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{1}{x^2}\,dx}{2\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(c^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} \\
&= -\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2x^2} \\
&\quad -\frac{\left(c^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\csc(x)\,dx,x,\arcsin(cx)\right)}{2\sqrt{1-c^2x^2}} \\
&= -\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2x^2} \\
&\quad +\frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad +\frac{\left(bc^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{2\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(bc^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{2\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2x^2} + \frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(ibc^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}} + \frac{\left(ibc^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2x^2} + \frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{ibc^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}} + \frac{ibc^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 1.68 (sec) , antiderivative size = 239, normalized size of antiderivative = 1.06

$$\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^3}\,dx$$
$$= \frac{1}{8}\left(-\frac{4a\sqrt{d-c^2dx^2}}{x^2} - 4ac^2\sqrt{d}\log(x) + 4ac^2\sqrt{d}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right) + \frac{bc^2d\sqrt{1-c^2x^2}\left(-2\cot\left(\frac{1}{2}\arcsin(cx)\right) - \arcsin(cx)\csc^2\left(\frac{1}{2}\arcsin(cx)\right) - 4\arcsin(cx)\log\left(1-e^{i\arcsin(cx)}\right)\right.}{}\right.$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] ((-4*a*Sqrt[d - c^2*d*x^2])/x^2 - 4*a*c^2*Sqrt[d]*Log[x] + 4*a*c^2*Sqrt[d]*
Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*c^2*d*Sqrt[1 - c^2*x^2]*(-2*Cot[A
rcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*Log[1 - E^
(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (4*I)*PolyLog
[2, -E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2, E^(I*ArcSin[c*x])] + ArcSin[c*x]
*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/Sqrt[d - c^2*d*x^2])/8
```

Maple [A] (verified)

Time = 0.17 (sec) , antiderivative size = 289, normalized size of antiderivative = 1.28

method	result
default	$a\left(-\frac{(-c^2dx^2+d)^{\frac{3}{2}}}{2dx^2}-\frac{c^2\left(\sqrt{-c^2dx^2+d}-\sqrt{d}\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)\right)}{2}\right)+b\left(-\frac{\left(c^2x^2\arcsin(cx)-cx\sqrt{-c^2x^2+1}-\arcsin(\right.}{2x^2(c^2x^2-1)}\right.$
parts	$a\left(-\frac{(-c^2dx^2+d)^{\frac{3}{2}}}{2dx^2}-\frac{c^2\left(\sqrt{-c^2dx^2+d}-\sqrt{d}\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)\right)}{2}\right)+b\left(-\frac{\left(c^2x^2\arcsin(cx)-cx\sqrt{-c^2x^2+1}-\arcsin(\right.}{2x^2(c^2x^2-1)}\right.$

[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)

[Out] a*(-1/2/d/x^2*(-c^2*d*x^2+d)^(3/2)-1/2*c^2*((-c^2*d*x^2+d)^(1/2)-d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)))+b*(-1/2*(c^2*x^2*arcsin(c*x)-c*x*(-c^2*x^2+1)^(1/2)-arcsin(c*x))*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)+I*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)))*c^2/(2*c^2*x^2-2))

Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^3}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)}{x^3}\,dx$$

[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")

[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^3, x)

Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^3}\,dx=\int \frac{\sqrt{-d(cx-1)(cx+1)}(a+b\operatorname{asin}{(cx)})}{x^3}\,dx$$

[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**3,x)

[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**3, x)

Maxima [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1))/x^3, x) + 1/2*(c^2*sqrt(d)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt
(d)/abs(x) + 2*d/abs(x)) - sqrt(-c^2*d*x^2 + d)*c^2 - (-c^2*d*x^2 + d)^(3/2
)/(d*x^2))*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^3}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{x^3}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^3, x)
```

3.67 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^5}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 301

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^5}\,dx = -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4x^4} + \frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8x^2} + \frac{c^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{4\sqrt{1-c^2x^2}} - \frac{ibc^4\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}} + \frac{ibc^4\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}}$$

```
[Out] -1/4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^4+1/8*c^2*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/x^2-1/12*b*c*(-c^2*d*x^2+d)^(1/2)/x^3/(-c^2*x^2+1)^(1/2
)+1/8*b*c^3*(-c^2*d*x^2+d)^(1/2)/x/(-c^2*x^2+1)^(1/2)+1/4*c^4*(a+b*arcsin(c
*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1
/2)-1/8*I*b*c^4*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)+1/8*I*b*c^4*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x
^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 301, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$, Rules used = {4781, 30, 4789, 4803, 4268, 2317, 2438}

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^5}\,dx = \frac{c^4\sqrt{d-c^2dx^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4\sqrt{1-c^2x^2}} + \frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8x^2} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4x^4} - \frac{ibc^4\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}} + \frac{ibc^4\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}} - \frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}}$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] -1/12*(b*c*Sqrt[d - c^2*d*x^2])/(x^3*Sqrt[1 - c^2*x^2]) + (b*c^3*Sqrt[d - c
^2*d*x^2])/(8*x*Sqrt[1 - c^2*x^2]) - (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/(4*x^4) + (c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*x^2) + (c^4*
Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(4*Sqrt
[1 - c^2*x^2]) - ((I/8)*b*c^4*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c
*x])])/Sqrt[1 - c^2*x^2] + ((I/8)*b*c^4*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(I
*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4x^4}+\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{1}{x^4}\,dx}{4\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(c^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{x^3\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} \\
&= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4x^4}+\frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8x^2} \\
&\quad -\frac{\left(bc^3\sqrt{d-c^2dx^2}\right)\int\frac{1}{x^2}\,dx}{8\sqrt{1-c^2x^2}}-\frac{\left(c^4\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4x^4} + \frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8x^2} - \frac{\left(c^4\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\csc(x)\,dx,x,\arcsin(cx)\right)}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4x^4} + \frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8x^2} + \frac{c^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{4\sqrt{1-c^2x^2}} + \frac{\left(bc^4\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{8\sqrt{1-c^2x^2}} - \frac{\left(bc^4\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4x^4} + \frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8x^2} + \frac{c^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{4\sqrt{1-c^2x^2}} - \frac{\left(ibc^4\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}} + \frac{\left(ibc^4\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4x^4} + \frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8x^2} + \frac{c^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{4\sqrt{1-c^2x^2}} - \frac{ibc^4\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}} + \frac{ibc^4\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 3.23 (sec) , antiderivative size = 321, normalized size of antiderivative = 1.07

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^5}\,dx$$
$$= \frac{a(-2+c^2x^2)\sqrt{d-c^2dx^2}}{8x^4} - \frac{1}{8}ac^4\sqrt{d}\log(x) + \frac{1}{8}ac^4\sqrt{d}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)$$
$$+ \frac{bc^4\sqrt{d-c^2dx^2}\Big(8\cot\left(\frac{1}{2}\arcsin(cx)\right)+6\arcsin(cx)\csc^2\left(\frac{1}{2}\arcsin(cx)\right)-cx\csc^4\left(\frac{1}{2}\arcsin(cx)\right)-3\arcsi}{}$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] (a*(-2 + c^2*x^2)*Sqrt[d - c^2*d*x^2])/(8*x^4) - (a*c^4*Sqrt[d]*Log[x])/8 +
 (a*c^4*Sqrt[d]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/8 + (b*c^4*Sqrt[d - c
^2*d*x^2]*(8*Cot[ArcSin[c*x]/2] + 6*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - c*x*
Csc[ArcSin[c*x]/2]^4 - 3*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^4 - 24*ArcSin[c*x]*
Log[1 - E^(I*ArcSin[c*x])] + 24*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (2
4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (24*I)*PolyLog[2, E^(I*ArcSin[c*x])]
- 6*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + 3*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^4 -
 (16*Sin[ArcSin[c*x]/2]^4)/(c^3*x^3) + 8*Tan[ArcSin[c*x]/2]))/(192*Sqrt[1 -
 c^2*x^2])
```

Maple [A] (verified)

Time = 0.19 (sec) , antiderivative size = 349, normalized size of antiderivative = 1.16

method	result
default	$-\frac{a\left(-c^2dx^2+d\right)^{\frac{3}{2}}}{4dx^4}-\frac{ac^2\left(-c^2dx^2+d\right)^{\frac{3}{2}}}{8dx^2}+\frac{ac^4\sqrt{d}\,\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)}{8}-\frac{ac^4\sqrt{-c^2dx^2+d}}{8}+b\Bigg(\frac{\left(3c^4x^4\arcsin(cx)-3\right.}{}$
parts	$-\frac{a\left(-c^2dx^2+d\right)^{\frac{3}{2}}}{4dx^4}-\frac{ac^2\left(-c^2dx^2+d\right)^{\frac{3}{2}}}{8dx^2}+\frac{ac^4\sqrt{d}\,\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)}{8}-\frac{ac^4\sqrt{-c^2dx^2+d}}{8}+b\Bigg(\frac{\left(3c^4x^4\arcsin(cx)-3\right.}{}$

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a/d/x^4*(-c^2*d*x^2+d)^(3/2)-1/8*a*c^2/d/x^2*(-c^2*d*x^2+d)^(3/2)+1/8*
a*c^4*d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-1/8*a*c^4*(-c^2*d*
x^2+d)^(1/2)+b*(1/24*(3*c^4*x^4*arcsin(c*x)-3*c^3*x^3*(-c^2*x^2+1)^(1/2)-9*
c^2*x^2*arcsin(c*x)+2*c*x*(-c^2*x^2+1)^(1/2)+6*arcsin(c*x))*(-d*(c^2*x^2-1)
)^(1/2)/x^4/(c^2*x^2-1)+I*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(I*arcs
in(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1
)^(1/2))-polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^
(1/2)))*c^4/(8*c^2*x^2-8))
```

Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^5}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{x^5}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/x^5, x)
```

Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^5}\,dx=\int \frac{\sqrt{-d(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))}{x^5}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/x**5,x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/x**5, x)
```

Maxima [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^5}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{x^5}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="maxima")
[Out] b*sqrt(d)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1))/x^5, x) + 1/8*(c^4*sqrt(d)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt
(d)/abs(x) + 2*d/abs(x)) - sqrt(-c^2*d*x^2 + d)*c^4 - (-c^2*d*x^2 + d)^(3/2
)*c^2/(d*x^2) - 2*(-c^2*d*x^2 + d)^(3/2)/(d*x^4))*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^5}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^5}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{x^5}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^5,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/x^5, x)
```

3.68 $\int x^4(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 340

$$\int x^4(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx=\frac{3bdx^2\sqrt{d-c^2dx^2}}{256c^3\sqrt{1-c^2x^2}}+\frac{bdx^4\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}-\frac{bcdx^6\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}}+\frac{bc^3dx^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}-\frac{3dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^4}-\frac{dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{64c^2}+\frac{1}{16}dx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{1}{8}x^5(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))+\frac{3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{256bc^5\sqrt{1-c^2x^2}}$$

```
[Out] 1/8*x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))-3/128*d*x*(a+b*arcsin(c*x))*
(-c^2*d*x^2+d)^(1/2)/c^4-1/64*d*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/
c^2+1/16*d*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+3/256*b*d*x^2*(-c^2*d
*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/256*b*d*x^4*(-c^2*d*x^2+d)^(1/2)/c/(
-c^2*x^2+1)^(1/2)-1/32*b*c*d*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/
64*b*c^3*d*x^8*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/256*d*(a+b*arcsin(
c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c^5/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 340, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used

$= \{4787, 4783, 4795, 4737, 30, 14\}$

$$\int x^4 \left(d-c^2 d x^2\right)^{3/2} (a+b \arcsin(cx))\, dx = \frac{1}{8} x^5 \left(d-c^2 d x^2\right)^{3/2} (a+b \arcsin(cx)) + \frac{1}{16} d x^5 \sqrt{d-c^2 d x^2} (a+b \arcsin(cx)) - \frac{d x^3 \sqrt{d-c^2 d x^2} (a+b \arcsin(cx))}{64 c^2} + \frac{3 d \sqrt{d-c^2 d x^2} (a+b \arcsin(cx))^2}{256 b c^5 \sqrt{1-c^2 x^2}} - \frac{3 d x \sqrt{d-c^2 d x^2} (a+b \arcsin(cx))}{128 c^4} - \frac{b c d x^6 \sqrt{d-c^2 d x^2}}{32 \sqrt{1-c^2 x^2}} + \frac{b d x^4 \sqrt{d-c^2 d x^2}}{256 c \sqrt{1-c^2 x^2}} + \frac{3 b d x^2 \sqrt{d-c^2 d x^2}}{256 c^3 \sqrt{1-c^2 x^2}} + \frac{b c^3 d x^8 \sqrt{d-c^2 d x^2}}{64 \sqrt{1-c^2 x^2}}$$

```
[In] Int[x^4*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3*b*d*x^2*Sqrt[d - c^2*d*x^2])/(256*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^4*Sqrt
[d - c^2*d*x^2])/(256*c*Sqrt[1 - c^2*x^2]) - (b*c*d*x^6*Sqrt[d - c^2*d*x^2]
)/(32*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^8*Sqrt[d - c^2*d*x^2])/(64*Sqrt[1 - c
^2*x^2]) - (3*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(128*c^4) - (d*x
^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(64*c^2) + (d*x^5*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/16 + (x^5*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c
*x]))/8 + (3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(256*b*c^5*Sqrt[1
 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
```

```
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{8}x^5\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{8}(3d)\int x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx \\
&\quad -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int x^5\left(1-c^2x^2\right)\,dx}{8\sqrt{1-c^2x^2}} \\
&= \frac{1}{16}dx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad +\frac{1}{8}x^5\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{\left(d\sqrt{d-c^2dx^2}\right)\int\frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int x^5\,dx}{16\sqrt{1-c^2x^2}}-\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\left(x^5-c^2x^7\right)\,dx}{8\sqrt{1-c^2x^2}} \\
&= -\frac{bcdx^6\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}}+\frac{bc^3dx^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}-\frac{dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{64c^2} \\
&\quad +\frac{1}{16}dx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{1}{8}x^5\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) \\
&\quad +\frac{\left(3d\sqrt{d-c^2dx^2}\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{64c^2\sqrt{1-c^2x^2}}+\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int x^3\,dx}{64c\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{bdx^4\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}} - \frac{bcdx^6\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}} + \frac{bc^3dx^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}} - \frac{3dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^4} - \frac{dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{64c^2} + \frac{1}{16}dx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{8}x^5\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{\left(3d\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{128c^4\sqrt{1-c^2x^2}} + \frac{\left(3bd\sqrt{d-c^2dx^2}\right)\int x\,dx}{128c^3\sqrt{1-c^2x^2}}$$

$$= \frac{3bdx^2\sqrt{d-c^2dx^2}}{256c^3\sqrt{1-c^2x^2}} + \frac{bdx^4\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}} - \frac{bcdx^6\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}} + \frac{bc^3dx^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}} - \frac{3dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^4} - \frac{dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{64c^2} + \frac{1}{16}dx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{8}x^5\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{256bc^5\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 193, normalized size of antiderivative = 0.57

$$\int x^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \frac{d\sqrt{d-c^2dx^2}\left(3a^2+b^2c^2x^2(3+c^2x^2-8c^4x^4+4c^6x^6)-2abcx\sqrt{1-c^2x^2}(3+2c^2x^2-24\right.}{2}$$

```
[In] Integrate[x^4*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(3*a^2 + b^2*c^2*x^2*(3 + c^2*x^2 - 8*c^4*x^4 + 4*c^
6*x^6) - 2*a*b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2 - 24*c^4*x^4 + 16*c^6*x
^6) - 2*b*(-3*a + b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2 - 24*c^4*x^4 + 16*
c^6*x^6))*ArcSin[c*x] + 3*b^2*ArcSin[c*x]^2))/(256*b*c^5*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.16 (sec) , antiderivative size = 770, normalized size of antiderivative = 2.26

method	result
default	$-\frac{a\,x^{3} \left(-c^{2} d\,x^{2}+d \right)^{\frac{5}{2}}}{8 c^{2} d}-\frac{a x \left(-c^{2} d\,x^{2}+d \right)^{\frac{5}{2}}}{16 c^{4} d}+\frac{a x \left(-c^{2} d\,x^{2}+d \right)^{\frac{3}{2}}}{64 c^{4}}+\frac{3 a d x \sqrt{-c^{2} d\,x^{2}+d}}{128 c^{4}}+\frac{3 a\,d^{2} \arctan\left(\frac{\sqrt{c^{2} d}\,x}{\sqrt{-c^{2} d\,x^{2}+d}}\right)}{128 c^{4} \sqrt{c^{2} d}}+b\Bigg(-\frac{3}{}$
parts	$-\frac{a\,x^{3} \left(-c^{2} d\,x^{2}+d \right)^{\frac{5}{2}}}{8 c^{2} d}-\frac{a x \left(-c^{2} d\,x^{2}+d \right)^{\frac{5}{2}}}{16 c^{4} d}+\frac{a x \left(-c^{2} d\,x^{2}+d \right)^{\frac{3}{2}}}{64 c^{4}}+\frac{3 a d x \sqrt{-c^{2} d\,x^{2}+d}}{128 c^{4}}+\frac{3 a\,d^{2} \arctan\left(\frac{\sqrt{c^{2} d}\,x}{\sqrt{-c^{2} d\,x^{2}+d}}\right)}{128 c^{4} \sqrt{c^{2} d}}+b\Bigg(-\frac{3}{}$

```
[In] int(x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8*a*x^3*(-c^2*d*x^2+d)^(5/2)/c^2/d-1/16*a/c^4*x*(-c^2*d*x^2+d)^(5/2)/d+1
/64*a/c^4*x*(-c^2*d*x^2+d)^(3/2)+3/128*a/c^4*d*x*(-c^2*d*x^2+d)^(1/2)+3/128
*a/c^4*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-3
/256*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/(c^2*x^2-1)*arcsin(c*x)^
2*d-1/16384*(-d*(c^2*x^2-1))^(1/2)*(-128*I*(-c^2*x^2+1)^(1/2)*x^8*c^8+128*c
^9*x^9+256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320*c^7*x^7-160*I*(-c^2*x^2+1)^(1/2
)*x^4*c^4+272*c^5*x^5+32*I*(-c^2*x^2+1)^(1/2)*c^2*x^2-88*c^3*x^3-I*(-c^2*x^
2+1)^(1/2)+8*c*x)*(8*arcsin(c*x)+I)*d/c^5/(c^2*x^2-1)+1/1024*(-d*(c^2*x^2-1
))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*
x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(4*arcsin(c*x)+I)*d/c^5/(c^2
*x^2-1)+1/1024*(-d*(c^2*x^2-1))^(1/2)*(8*I*(-c^2*x^2+1)^(1/2)*c^4*x^4+8*c^5
*x^5-8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+4*c*x)*
(-I+4*arcsin(c*x))*d/c^5/(c^2*x^2-1)-1/16384*(-d*(c^2*x^2-1))^(1/2)*(128*I*
(-c^2*x^2+1)^(1/2)*x^8*c^8+128*c^9*x^9-256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320
*c^7*x^7+160*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+272*c^5*x^5-32*I*(-c^2*x^2+1)^(1/
2)*x^2*c^2-88*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+8*c*x)*(-I+8*arcsin(c*x))*d/c^5/
(c^2*x^2-1))
```

Fricas [F]

$$\int x^4 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)x^4\,dx$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^6 - a*d*x^4 + (b*c^2*d*x^6 - b*d*x^4)*arcsin(c*x))*sqr
t(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int x^4 (d - c^2dx^2)^{3/2} (a + b\arcsin(cx))\, dx = \text{Timed out}$$

```
[In] integrate(x**4*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
[Out] Timed out
```

Maxima [F]

$$\int x^4 (d - c^2dx^2)^{3/2} (a + b\arcsin(cx))\, dx = \int (-c^2dx^2 + d)^{\frac{3}{2}} (b\arcsin(cx) + a)x^4\, dx$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] b*sqrt(d)*integrate(-(c^2*d*x^6 - d*x^4)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) - 1/128*(16*(-c^2*d*x^2 + d)^(5/2
)*x^3/(c^2*d) - 2*(-c^2*d*x^2 + d)^(3/2)*x/c^4 + 8*(-c^2*d*x^2 + d)^(5/2)*x
/(c^4*d) - 3*sqrt(-c^2*d*x^2 + d)*d*x/c^4 - 3*d^(3/2)*arcsin(c*x)/c^5)*a
```

Giac [F]

$$\int x^4 (d - c^2dx^2)^{3/2} (a + b\arcsin(cx))\, dx = \int (-c^2dx^2 + d)^{\frac{3}{2}} (b\arcsin(cx) + a)x^4\, dx$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)*x^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^4 (d - c^2dx^2)^{3/2} (a + b\arcsin(cx))\, dx = \int x^4 (a + b\,\mathrm{asin}(c\,x))\, \left(d - c^2\,d\,x^2\right)^{3/2} dx$$

```
[In] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.69 $\int x^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 265

$$\int x^2\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\frac{bdx^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}}-\frac{7bcdx^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}-\frac{dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^2}+\frac{1}{8}dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc^3\sqrt{1-c^2x^2}}$$

```
[Out] 1/6*x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))-1/16*d*x*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/c^2+1/8*d*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+1/
32*b*d*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-7/96*b*c*d*x^4*(-c^2*d
*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/36*b*c^3*d*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^
2*x^2+1)^(1/2)+1/32*d*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*
x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 265, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used

= {4787, 4783, 4795, 4737, 30, 14}

$$\int x^2\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = -\frac{dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^2}+\frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{1}{8}dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc^3\sqrt{1-c^2x^2}} + \frac{bdx^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}}-\frac{7bcdx^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}$$

```
[In] Int[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d*x^2*Sqrt[d - c^2*d*x^2])/(32*c*Sqrt[1 - c^2*x^2]) - (7*b*c*d*x^4*Sqrt[
d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^6*Sqrt[d - c^2*d*x^2])/
(36*Sqrt[1 - c^2*x^2]) - (d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*
c^2) + (d*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/8 + (x^3*(d - c^2*d*
x^2)^(3/2)*(a + b*ArcSin[c*x]))/6 + (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])^2)/(32*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
```

```
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{2}d\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx \\
&\quad -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int x^3\left(1-c^2x^2\right)\,dx}{6\sqrt{1-c^2x^2}} \\
&= \frac{1}{8}dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad +\frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{\left(d\sqrt{d-c^2dx^2}\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int x^3\,dx}{8\sqrt{1-c^2x^2}}-\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\left(x^3-c^2x^5\right)\,dx}{6\sqrt{1-c^2x^2}} \\
&= -\frac{7bcdx^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}}-\frac{dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^2} \\
&\quad +\frac{1}{8}dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) \\
&\quad +\frac{\left(d\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{16c^2\sqrt{1-c^2x^2}}+\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int x\,dx}{16c\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= \frac{bdx^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}} - \frac{7bcdx^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{bc^3dx^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}} - \frac{dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^2} + \frac{1}{8}dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{6}x^3(d-c^2dx^2)^{3/2}(a+b\arcsin(cx)) + \frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc^3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 170, normalized size of antiderivative = 0.64

$$\int x^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx = \frac{d\sqrt{d-c^2dx^2}\left(9a^2+b^2c^2x^2(9-21c^2x^2+8c^4x^4)-6abcx\sqrt{1-c^2x^2}(3-14c^2x^2+8c^4x^4)\right.}{288bc^3\sqrt{1-}$$

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(9*a^2 + b^2*c^2*x^2*(9 - 21*c^2*x^2 + 8*c^4*x^4) -
6*a*b*c*x*Sqrt[1 - c^2*x^2]*(3 - 14*c^2*x^2 + 8*c^4*x^4) + 6*b*(3*a + b*c*x
*Sqrt[1 - c^2*x^2]*(-3 + 14*c^2*x^2 - 8*c^4*x^4))*ArcSin[c*x] + 9*b^2*ArcSi
n[c*x]^2))/(288*b*c^3*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.15 (sec) , antiderivative size = 682, normalized size of antiderivative = 2.57

method	result
default	$-\frac{ax(-c^2dx^2+d)^{\frac{5}{2}}}{6c^2d}+\frac{ax(-c^2dx^2+d)^{\frac{3}{2}}}{24c^2}+\frac{adx\sqrt{-c^2dx^2+d}}{16c^2}+\frac{ad^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{16c^2\sqrt{c^2d}}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+}}{32c^3(c^2x^2-}\right.$
parts	$-\frac{ax(-c^2dx^2+d)^{\frac{5}{2}}}{6c^2d}+\frac{ax(-c^2dx^2+d)^{\frac{3}{2}}}{24c^2}+\frac{adx\sqrt{-c^2dx^2+d}}{16c^2}+\frac{ad^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{16c^2\sqrt{c^2d}}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+}}{32c^3(c^2x^2-}\right.$

```
[In] int(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*a*x*(-c^2*d*x^2+d)^(5/2)/c^2/d+1/24*a/c^2*x*(-c^2*d*x^2+d)^(3/2)+1/16*
a/c^2*d*x*(-c^2*d*x^2+d)^(1/2)+1/16*a/c^2*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^
(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-1/32*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^
(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*d-1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*
(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^
5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x
```

```
)*(I+6*arcsin(c*x))*d/c^3/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c
^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(
c*x))*d/c^3/(c^2*x^2-1)+1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*
x^2+1)^(1/2)-I)*(11*I+24*arcsin(c*x))*cos(5*arcsin(c*x))*d/c^3/(c^2*x^2-1)-
1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(7*I+48*
arcsin(c*x))*sin(5*arcsin(c*x))*d/c^3/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1
/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(8*arcsin(c*x)+I)*cos(3*arcsin(c*x
))*d/c^3/(c^2*x^2-1)+3/512*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+
1)^(1/2)-I)*sin(3*arcsin(c*x))*d/c^3/(c^2*x^2-1))
```

Fricas [F]

$$\int x^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx = \int (-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-(a*c^2*d*x^4 - a*d*x^2 + (b*c^2*d*x^4 - b*d*x^2)*arcsin(c*x))*sqr
t(-c^2*d*x^2 + d), x)
```

Sympy [F]

$$\int x^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx = \int x^2(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))\,dx$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
[Out] Integral(x**2*(-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int x^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx = \int (-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] b*sqrt(d)*integrate(-(c^2*d*x^4 - d*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/48*a*(2*(-c^2*d*x^2 + d)^(3/2
)*x/c^2 - 8*(-c^2*d*x^2 + d)^(5/2)*x/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*d*x/c
^2 + 3*d^(3/2)*arcsin(c*x)/c^3)
```

Giac [F]

$$\int x^2 (d - c^2 d x^2)^{3/2} (a + b \arcsin(cx)) \, dx = \int (-c^2 d x^2 + d)^{\frac{3}{2}} (b \arcsin(cx) + a) x^2 \, dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)*x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^2 (d - c^2 d x^2)^{3/2} (a + b \arcsin(cx)) \, dx = \int x^2 (a + b \operatorname{asin}(c x)) \left(d - c^2 d x^2\right)^{3/2} dx$$

```
[In] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.70 $\int (d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 24, antiderivative size = 188

$$\int (d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx=-\frac{5bcdx^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{bc^3dx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{3}{8}dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{1}{4}x(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))+\frac{3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}$$

```
[Out] 1/4*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+3/8*d*x*(a+b*arcsin(c*x))*(-c^
2*d*x^2+d)^(1/2)-5/16*b*c*d*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/1
6*b*c^3*d*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/16*d*(a+b*arcsin(c*
x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4743, 4741, 4737, 30, 14}

$$\int (d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx=\frac{1}{4}x(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))+\frac{3}{8}dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}-\frac{5bcdx^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{bc^3dx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}$$

```
[In] Int[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-5*b*c*d*x^2*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^4*Sq
rt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) + (3*d*x*Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]))/8 + (x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*d
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{4}(3d)\int\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)\,dx}{4\sqrt{1-c^2x^2}}$$

$$= \frac{3}{8}dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{\left(3d\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \left(x-c^2x^3\right)\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(3bcd\sqrt{d-c^2dx^2}\right)\int x\,dx}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{5bcdx^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{bc^3dx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{3}{8}dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.50 (sec) , antiderivative size = 210, normalized size of antiderivative = 1.12

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \frac{24bd\sqrt{d-c^2dx^2}\arcsin(cx)^2 - 48ad^{3/2}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right) + d\sqrt{d-c^2dx^2}(16$$

```
[In] Integrate[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (24*b*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2 - 48*a*d^(3/2)*Sqrt[1 - c^2*x^2]*
ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + d*Sqrt[d - c^2
*d*x^2]*(16*a*c*x*(5 - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] + 16*b*Cos[2*ArcSin[c*x
]] + b*Cos[4*ArcSin[c*x]]) + 4*b*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*(8*Sin[2
*ArcSin[c*x]] + Sin[4*ArcSin[c*x]]))/(128*c*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.13 (sec) , antiderivative size = 480, normalized size of antiderivative = 2.55

method	result
default	$\frac{ax(-c^2dx^2+d)^{\frac{3}{2}}}{4} + \frac{3adx\sqrt{-c^2dx^2+d}}{8} + \frac{3ad^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8\sqrt{c^2d}} + b\left(-\frac{3\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\arcsin(cx)^2d}{16c(c^2x^2-1)} - \right.$
parts	$\frac{ax(-c^2dx^2+d)^{\frac{3}{2}}}{4} + \frac{3adx\sqrt{-c^2dx^2+d}}{8} + \frac{3ad^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8\sqrt{c^2d}} + b\left(-\frac{3\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\arcsin(cx)^2d}{16c(c^2x^2-1)} - \right.$

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*a*x*(-c^2*d*x^2+d)^(3/2)+3/8*a*d*x*(-c^2*d*x^2+d)^(1/2)+3/8*a*d^2/(c^2*
d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-3/16*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*d-1/256*(-d*(c^2*
x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(
1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(4*arcsin(c*x)+I)*d/c/(
c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^
3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*d/c/(c^2*x^2-1)-1/256*
(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(17*I+28*arcsin
(c*x))*cos(3*arcsin(c*x))*d/c/(c^2*x^2-1)+3/256*(-d*(c^2*x^2-1))^(1/2)*(I*(
-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(5*I+12*arcsin(c*x))*sin(3*arcsin(c*x))*d/
c/(c^2*x^2-1))
```

Fricas [F]

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d), x)
```

Sympy [F]

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\int \left(-d(cx-1)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate(-(c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3
*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*arcsin(c*x)/c)*a
```

Giac [F(-2)]

Exception generated.

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

```
[In] int((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.71 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 185

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^2}\,dx = \frac{bc^3dx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} - \frac{3}{2}c^2dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x} - \frac{3cd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4b\sqrt{1-c^2x^2}} + \frac{bcd\sqrt{d-c^2dx^2}\log(x)}{\sqrt{1-c^2x^2}}$$

```
[Out] -(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x-3/2*c^2*d*x*(a+b*arcsin(c*x))*(-c
^2*d*x^2+d)^(1/2)+1/4*b*c^3*d*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-3
/4*c*d*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)+b*c*d*
ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {4785, 4741, 4737, 30, 14}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^2}\,dx = -\frac{3}{2}c^2dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{3cd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4b\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x} + \frac{bcd\log(x)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{bc^3dx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (b*c^3*d*x^2*Sqrt[d - c^2*d*x^2])/(4*Sqrt[1 - c^2*x^2]) - (3*c^2*d*x*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x]))/2 - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin
[c*x]))/x - (3*c*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*Sqrt[1 -
 c^2*x^2]) + (b*c*d*Sqrt[d - c^2*d*x^2]*Log[x])/Sqrt[1 - c^2*x^2]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x} \\
&\quad -(3c^2d)\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx+\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{1-c^2x^2}{x}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{3}{2}c^2dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x}+\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \left(\frac{1}{x}-c^2x\right)\,dx}{\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(3c^2d\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}+\frac{\left(3bc^3d\sqrt{d-c^2dx^2}\right)\int x\,dx}{2\sqrt{1-c^2x^2}} \\
&= \frac{bc^3dx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}-\frac{3}{2}c^2dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&\quad -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x} \\
&\quad -\frac{3cd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4b\sqrt{1-c^2x^2}}+\frac{bcd\sqrt{d-c^2dx^2}\log(x)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.48 (sec) , antiderivative size = 222, normalized size of antiderivative = 1.20

$$
\begin{aligned}
\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^2}\,dx &= \left(-\frac{ad}{x}-\frac{1}{2}ac^2dx\right)\sqrt{-d(-1+c^2x^2)} \\
&\quad +\frac{3}{2}acd^{3/2}\arctan\left(\frac{cx\sqrt{-d(-1+c^2x^2)}}{\sqrt{d}(-1+c^2x^2)}\right) \\
&\quad -\frac{bcd\sqrt{d(1-c^2x^2)}\left(\frac{2\sqrt{1-c^2x^2}\arcsin(cx)}{cx}+\arcsin(cx)^2-2\log(cx)\right)}{2\sqrt{1-c^2x^2}} \\
&\quad -\frac{bcd\sqrt{d(1-c^2x^2)}(\cos(2\arcsin(cx))+2\arcsin(cx)(\arcsin(cx)+\sin(2\arcsin(cx))))}{8\sqrt{1-c^2x^2}}
\end{aligned}
$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (-((a*d)/x) - (a*c^2*d*x)/2)*Sqrt[-(d*(-1 + c^2*x^2))] + (3*a*c*d^(3/2)*Arc
Tan[(c*x*Sqrt[-(d*(-1 + c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))])/2 - (b*c*d*S
qrt[d*(1 - c^2*x^2)]*((2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*x) + ArcSin[c*x]
^2 - 2*Log[c*x]))/(2*Sqrt[1 - c^2*x^2]) - (b*c*d*Sqrt[d*(1 - c^2*x^2)]*(Cos
[2*ArcSin[c*x]] + 2*ArcSin[c*x]*(ArcSin[c*x] + Sin[2*ArcSin[c*x]])))/(8*Sqr
t[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.16 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.34

method	result
default	$-\frac{a\left(-c^2 d\,x^2+d\right)^{\frac{5}{2}}}{dx}-a\,c^2x\left(-c^2d\,x^2+d\right)^{\frac{3}{2}}-\frac{3a\,c^2dx\sqrt{-c^2d\,x^2+d}}{2}-\frac{3a\,c^2d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2\sqrt{c^2d}}+\frac{b\sqrt{-d\left(c^2x^2-1\right)}\,\sqrt{\ }}{\ }$
parts	$-\frac{a\left(-c^2 d\,x^2+d\right)^{\frac{5}{2}}}{dx}-a\,c^2x\left(-c^2d\,x^2+d\right)^{\frac{3}{2}}-\frac{3a\,c^2dx\sqrt{-c^2d\,x^2+d}}{2}-\frac{3a\,c^2d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2\sqrt{c^2d}}+\frac{b\sqrt{-d\left(c^2x^2-1\right)}\,\sqrt{\ }}{\ }$

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -a/d/x*(-c^2*d*x^2+d)^(5/2)-a*c^2*x*(-c^2*d*x^2+d)^(3/2)-3/2*a*c^2*d*x*(-c^
2*d*x^2+d)^(1/2)-3/2*a*c^2*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d
*x^2+d)^(1/2))+1/8*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)/
x*(4*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+6*c*x*arcsin(c*x)^2+8
*I*arcsin(c*x)*x*c-8*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*x*c+8*arcsin(c*x)*(
-c^2*x^2+1)^(1/2)+c*x)*d
```

Fricas [F]

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{x^2}\,dx=\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x^2, x)
```

Sympy [F]

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{x^2}\,dx=\int \frac{\left(-d(cx-1)(cx+1)\right)^{\frac{3}{2}}(a+b\operatorname{asin}(cx))}{x^2}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**2,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**2, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^2}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{x^2}\,dx$$

[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")

[Out] -b*sqrt(d)*integrate((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^2, x) - 1/2*(3*sqrt(-c^2*d*x^2 + d)*c^2*d*x + 3*c*d^(3/2)*arcsin(c*x) + 2*(-c^2*d*x^2 + d)^(3/2)/x)*a

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^2}\,dx = \text{Exception raised: TypeError}$$

[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)^{3/2}}{x^2}\,dx$$

[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^2,x)

[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^2, x)

3.72 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^4}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 191

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^4}\,dx = -\frac{bcd\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}} + \frac{c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x^3} + \frac{c^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2b\sqrt{1-c^2x^2}} - \frac{4bc^3d\sqrt{d-c^2dx^2}\log(x)}{3\sqrt{1-c^2x^2}}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3+c^2*d*(a+b*arcsin(c*x))*(-c
^2*d*x^2+d)^(1/2)/x-1/6*b*c*d*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)+1
/2*c^3*d*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)-4/3*
b*c^3*d*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 191, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {4785, 4781, 29, 4737, 14}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^4}\,dx = \frac{c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x^3} + \frac{c^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2b\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}} - \frac{4bc^3d\log(x)\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/6*(b*c*d*Sqrt[d - c^2*d*x^2])/(x^2*Sqrt[1 - c^2*x^2]) + (c^2*d*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x]))/x - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*
x]))/(3*x^3) + (c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*Sqrt[
1 - c^2*x^2]) - (4*b*c^3*d*Sqrt[d - c^2*d*x^2]*Log[x])/(3*Sqrt[1 - c^2*x^2]
)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x^3} - (c^2d)\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^2}\,dx + \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\frac{1-c^2x^2}{x^3}\,dx}{3\sqrt{1-c^2x^2}}$$

$$= \frac{c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x^3} + \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\left(\frac{1}{x^3}-\frac{c^2}{x}\right)dx}{3\sqrt{1-c^2x^2}} - \frac{\left(bc^3d\sqrt{d-c^2dx^2}\right)\int\frac{1}{x}\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(c^4d\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}} + \frac{c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x^3} + \frac{c^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2b\sqrt{1-c^2x^2}} - \frac{4bc^3d\sqrt{d-c^2dx^2}\log(x)}{3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.64 (sec) , antiderivative size = 211, normalized size of antiderivative = 1.10

$$\int\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^4}\,dx = \frac{bd(-1+4c^2x^2)\sqrt{d-c^2dx^2}\arcsin(cx)}{3x^3} + \frac{bc^3d\sqrt{d-c^2dx^2}\arcsin(cx)^2}{2\sqrt{1-c^2x^2}} - ac^3d^{3/2}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right) - \frac{d\sqrt{d-c^2dx^2}\left(bcx+2a(1-4c^2x^2)\sqrt{1-c^2x^2}+8bc^3x^3\log(cx)\right)}{6x^3\sqrt{1-c^2x^2}}$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (b*d*(-1 + 4*c^2*x^2)*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(3*x^3) + (b*c^3*d*S
qrt[d - c^2*d*x^2]*ArcSin[c*x]^2)/(2*Sqrt[1 - c^2*x^2]) - a*c^3*d^(3/2)*Arc
Tan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] - (d*Sqrt[d - c^2*d
*x^2]*(b*c*x + 2*a*(1 - 4*c^2*x^2)*Sqrt[1 - c^2*x^2] + 8*b*c^3*x^3*Log[c*x]
))/(6*x^3*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.19 (sec) , antiderivative size = 276, normalized size of antiderivative = 1.45

method	result
default	$-\frac{a\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{3 d\,x^{3}}+\frac{2 a\,c^{2} \left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{3 d x}+\frac{2 a\,c^{4} x \left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}{3}+a\,c^{4} d x \sqrt{-c^{2} d\,x^{2}+d}+\frac{a\,c^{4} d^{2} \arctan\left(\frac{\sqrt{c^{2} d}\,x}{\sqrt{-c^{2} d\,x^{2}+}}\right)}{\sqrt{c^{2} d}}$
parts	$-\frac{a\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{3 d\,x^{3}}+\frac{2 a\,c^{2} \left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{3 d x}+\frac{2 a\,c^{4} x \left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}{3}+a\,c^{4} d x \sqrt{-c^{2} d\,x^{2}+d}+\frac{a\,c^{4} d^{2} \arctan\left(\frac{\sqrt{c^{2} d}\,x}{\sqrt{-c^{2} d\,x^{2}+}}\right)}{\sqrt{c^{2} d}}$

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*a/d/x^3*(-c^2*d*x^2+d)^(5/2)+2/3*a*c^2/d/x*(-c^2*d*x^2+d)^(5/2)+2/3*a*
c^4*x*(-c^2*d*x^2+d)^(3/2)+a*c^4*d*x*(-c^2*d*x^2+d)^(1/2)+a*c^4*d^2/(c^2*d)
^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/6*b*(-d*(c^2*x^2-1))^
(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)/x^3*(3*c^3*x^3*arcsin(c*x)^2+8*I*arcsi
n(c*x)*x^3*c^3-8*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*x^3*c^3+8*(-c^2*x^2+1)^
(1/2)*arcsin(c*x)*x^2*c^2-2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-c*x)*d
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^4}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{3}{2}}\,(b\arcsin{(cx)}+a)}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x^4, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^4}\,dx=\int \frac{(-d(cx-1)\,(cx+1))^{\frac{3}{2}}\,(a+b\operatorname{asin}{(cx)})}{x^4}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**4,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**4, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^4}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] -b*sqrt(d)*integrate((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^4, x) + 1/3*(3*sqrt(-c^2*d*x^2 + d)*c^4
*d*x + 3*c^3*d^(3/2)*arcsin(c*x) + 2*(-c^2*d*x^2 + d)^(3/2)*c^2/x - (-c^2*d
*x^2 + d)^(5/2)/(d*x^3))*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^4}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^4}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,{(d-c^2\,d\,x^2)}^{3/2}}{x^4}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^4, x)
```

3.73 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^6}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 154

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^6}\,dx = -\frac{bcd\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}+\frac{bc^3d\sqrt{d-c^2dx^2}}{5x^2\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5dx^5}+\frac{bc^5d\sqrt{d-c^2dx^2}\log(x)}{5\sqrt{1-c^2x^2}}$$

```
[Out] -1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/d/x^5-1/20*b*c*d*(-c^2*d*x^2+d)
^(1/2)/x^4/(-c^2*x^2+1)^(1/2)+1/5*b*c^3*d*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^
2+1)^(1/2)+1/5*b*c^5*d*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4771, 272, 45}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^6}\,dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5dx^5} - \frac{bcd\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}+\frac{bc^5d\log(x)\sqrt{d-c^2dx^2}}{5\sqrt{1-c^2x^2}}+\frac{bc^3d\sqrt{d-c^2dx^2}}{5x^2\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] -1/20*(b*c*d*Sqrt[d - c^2*d*x^2])/(x^4*Sqrt[1 - c^2*x^2]) + (b*c^3*d*Sqrt[d
 - c^2*d*x^2])/(5*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*Ar
cSin[c*x]))/(5*d*x^5) + (b*c^5*d*Sqrt[d - c^2*d*x^2]*Log[x])/(5*Sqrt[1 - c^
2*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5dx^5}+\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\frac{(1-c^2x^2)^2}{x^5}\,dx}{5\sqrt{1-c^2x^2}}\\
&= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5dx^5}+\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{(1-c^2x)^2}{x^3}\,dx,x,x^2\right)}{10\sqrt{1-c^2x^2}}\\
&= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5dx^5}+\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{x^3}-\frac{2c^2}{x^2}+\frac{c^4}{x}\right)dx,x,x^2\right)}{10\sqrt{1-c^2x^2}}\\
&= -\frac{bcd\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}}+\frac{bc^3d\sqrt{d-c^2dx^2}}{5x^2\sqrt{1-c^2x^2}}\\
&\quad-\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5dx^5}+\frac{bc^5d\sqrt{d-c^2dx^2}\log(x)}{5\sqrt{1-c^2x^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.01

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^6}\,dx = \frac{d\sqrt{d-c^2dx^2}\left(-3bcx+12bc^3x^3-25bc^5x^5-12a\sqrt{1-c^2x^2}+24ac\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(-3*b*c*x + 12*b*c^3*x^3 - 25*b*c^5*x^5 - 12*a*Sqrt[
1 - c^2*x^2] + 24*a*c^2*x^2*Sqrt[1 - c^2*x^2] - 12*a*c^4*x^4*Sqrt[1 - c^2*x
^2] - 12*b*(1 - c^2*x^2)^(5/2)*ArcSin[c*x] + 12*b*c^5*x^5*Log[x]))/(60*x^5*
Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.22 (sec) , antiderivative size = 2350, normalized size of antiderivative = 15.26

method	result	size
default	Expression too large to display	2350
parts	Expression too large to display	2350

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^6,x,method=_RETURNVERBOSE)
```

```
[Out] -1/5*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^
2*x^2+1)^(1/2))^2-1)*c^5*d+1/5*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6
*x^6+10*c^4*x^4-5*c^2*x^2+1)/x^5/(c^2*x^2-1)*arcsin(c*x)-1/5*a/d/x^5*(-c^2*
d*x^2+d)^(5/2)-I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^
4-5*c^2*x^2+1)*x^8/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^13+2*I*b*(-
d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^6/(c
^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^11-2*I*b*(-d*(c^2*x^2-1))^(1/2)*
d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^4/(c^2*x^2-1)*(-c^2*x^2+1
)^(1/2)*arcsin(c*x)*c^9-1/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*
x^6+10*c^4*x^4-5*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5+
1/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2
+1)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^12-9/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*
c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^5/(c^2*x^2-1)*(-c^2*x^2+1)*c^1
0+3/10*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*
x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^8-1/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(
5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^6
+I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)
*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^7-13/20*I*b*(-d*(c^2*x^2-
1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^7/(c^2*x^2-1)*c
```

```
^12+3/4*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2
*x^2+1)*x^5/(c^2*x^2-1)*c^10-7/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-1
0*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^8+28/5*b*(-d*(c^2*x^2-1
))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/x/(c^2*x^2-1)*arcs
in(c*x)*c^4-8/5*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4
-5*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^2+1/20*b*(-d*(c^2*x^2-1))^(1/2)
*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/x^4/(c^2*x^2-1)*(-c^2*x^2+
1)^(1/2)*c-b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^
2*x^2+1)*x^9/(c^2*x^2-1)*arcsin(c*x)*c^14+5*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c
^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^7/(c^2*x^2-1)*arcsin(c*x)*c^12-
11*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)
*x^5/(c^2*x^2-1)*arcsin(c*x)*c^10+9/4*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8
-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^9+
14*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)
*x^3/(c^2*x^2-1)*arcsin(c*x)*c^8-5/2*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-
10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^2/(c^2*x^2-1)*c^7*(-c^2*x^2+1)^(1/2)-5
6/5*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1
)*x/(c^2*x^2-1)*arcsin(c*x)*c^6+1/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^
8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x/(c^2*x^2-1)*c^6+2*I*b*(-d*(c^2*x^2-1
))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5*d/(5*c^2*x^2-5)+1/5*I*b*(-d*(c^
2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^9/(c^2*x^
2-1)*c^14-b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2
*x^2+1)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^11-9/20*b*(-d*(c^2*x^2-1))^(1/
2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/x^2/(c^2*x^2-1)*c^3*(-c^
2*x^2+1)^(1/2)+3/2*b*(-d*(c^2*x^2-1))^(1/2)*d/(5*c^8*x^8-10*c^6*x^6+10*c^4*
x^4-5*c^2*x^2+1)/(c^2*x^2-1)*c^5*(-c^2*x^2+1)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 525, normalized size of antiderivative = 3.41

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^6}\,dx = \left[\frac{2\left(bc^7dx^7-bc^5dx^5\right)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4-\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}(x^4-1)}{c^2x^4-x^2}\right.}{}\right.$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] [1/20*(2*(b*c^7*d*x^7 - b*c^5*d*x^5)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d
*x^4 - sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*
x^4 - x^2)) - (4*b*c^3*d*x^3 - (4*b*c^3 - b*c)*d*x^5 - b*c*d*x)*sqrt(-c^2*d
*x^2 + d)*sqrt(-c^2*x^2 + 1) - 4*(a*c^6*d*x^6 - 3*a*c^4*d*x^4 + 3*a*c^2*d*x
^2 - a*d + (b*c^6*d*x^6 - 3*b*c^4*d*x^4 + 3*b*c^2*d*x^2 - b*d)*arcsin(c*x))
*sqrt(-c^2*d*x^2 + d))/(c^2*x^7 - x^5), 1/20*(4*(b*c^7*d*x^7 - b*c^5*d*x^5)
```

```
*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)
/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) - (4*b*c^3*d*x^3 - (4*b*c^3 - b*c)*d*x^
5 - b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 4*(a*c^6*d*x^6 - 3*a
*c^4*d*x^4 + 3*a*c^2*d*x^2 - a*d + (b*c^6*d*x^6 - 3*b*c^4*d*x^4 + 3*b*c^2*d
*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^7 - x^5)]
```

Sympy [F]

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{x^6}\,dx = \int \frac{\left(-d(cx-1)\,(cx+1)\right)^{\frac{3}{2}}(a+b\operatorname{asin}(cx))}{x^6}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**6,x)
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**6, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.12

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{x^6}\,dx = -\frac{\left(2\,(-1)^{-2\,c^2dx^2+2\,d}\,c^4d^{\frac{5}{2}}\log\left(-2\,c^2d+\frac{2\,d}{x^2}\right)+2\,c^4d^{\frac{5}{2}}\log\left(x^2-\frac{1}{c^2}\right)-\frac{3\,\sqrt{c^4dx^4-2\,c^2dx^2+d}c^2d^2}{x^2}+\frac{\sqrt{c^4dx^4-2\,c^2dx^2+d}d^2}{x^4}}{20\,d} - \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}b\arcsin(cx)}{5\,dx^5} - \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}a}{5\,dx^5}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="maxima")
[Out] -1/20*(2*(-1)^(-2*c^2*d*x^2 + 2*d)*c^4*d^(5/2)*log(-2*c^2*d + 2*d/x^2) + 2*
c^4*d^(5/2)*log(x^2 - 1/c^2) - 3*sqrt(c^4*d*x^4 - 2*c^2*d*x^2 + d)*c^2*d^2/
x^2 + sqrt(c^4*d*x^4 - 2*c^2*d*x^2 + d)*d^2/x^4)*b*c/d - 1/5*(-c^2*d*x^2 +
d)^(5/2)*b*arcsin(c*x)/(d*x^5) - 1/5*(-c^2*d*x^2 + d)^(5/2)*a/(d*x^5)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^6}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^6}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)^{3/2}}{x^6}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^6,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^6, x)
```

3.74 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^8}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 231

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^8}\,dx = -\frac{bcd\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}} + \frac{2bc^3d\sqrt{d-c^2dx^2}}{35x^4\sqrt{1-c^2x^2}} - \frac{bc^5d\sqrt{d-c^2dx^2}}{70x^2\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{7dx^7} - \frac{2c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{35dx^5} + \frac{2bc^7d\sqrt{d-c^2dx^2}\log(x)}{35\sqrt{1-c^2x^2}}$$

```
[Out] -1/7*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/d/x^7-2/35*c^2*(-c^2*d*x^2+d)^(
5/2)*(a+b*arcsin(c*x))/d/x^5-1/42*b*c*d*(-c^2*d*x^2+d)^(1/2)/x^6/(-c^2*x^2+
1)^(1/2)+2/35*b*c^3*d*(-c^2*d*x^2+d)^(1/2)/x^4/(-c^2*x^2+1)^(1/2)-1/70*b*c^
5*d*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)+2/35*b*c^7*d*ln(x)*(-c^2*d*
x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 231, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {277, 270, 4779, 12, 457, 77}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^8}\,dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{7dx^7} - \frac{2c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{35dx^5} - \frac{bcd\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}} + \frac{2bc^7d\log(x)\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}} - \frac{bc^5d\sqrt{d-c^2dx^2}}{70x^2\sqrt{1-c^2x^2}} + \frac{2bc^3d\sqrt{d-c^2dx^2}}{35x^4\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] -1/42*(b*c*d*Sqrt[d - c^2*d*x^2])/(x^6*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*Sqrt
[d - c^2*d*x^2])/(35*x^4*Sqrt[1 - c^2*x^2]) - (b*c^5*d*Sqrt[d - c^2*d*x^2])
/(70*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(
7*d*x^7) - (2*c^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(35*d*x^5) + (
2*b*c^7*d*Sqrt[d - c^2*d*x^2]*Log[x])/(35*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 77

```
Int[((d_.)*(x_))^(n_.)*((a_) + (b_.)*(x_))*((e_) + (f_.)*(x_))^(p_.), x_Sym
bol] :> Int[ExpandIntegrand[(a + b*x)*(d*x)^n*(e + f*x)^p, x], x] /; FreeQ[
{a, b, d, e, f, n}, x] && IGtQ[p, 0] && (NeQ[n, -1] || EqQ[p, 1]) && NeQ[b*
e + a*f, 0] && ( !IntegerQ[n] || LtQ[9*p + 5*n, 0] || GeQ[n + p + 1, 0] ||
(GeQ[n + p + 2, 0] && RationalQ[a, b, d, e, f])) && (NeQ[n + p + 3, 0] || E
qQ[p, 1])
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
```

```
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\text{integral} = -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{7dx^7} - \frac{2c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{35dx^5} - \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{d(-5-2c^2x^2)(1-c^2x^2)^2}{35x^7}\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{7dx^7} - \frac{2c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{35dx^5} - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int \frac{(-5-2c^2x^2)(1-c^2x^2)^2}{x^7}\,dx}{35\sqrt{1-c^2x^2}}$$

$$= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{7dx^7} - \frac{2c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{35dx^5} - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{(-5-2c^2x)(1-c^2x)^2}{x^4}\,dx,x,x^2\right)}{70\sqrt{1-c^2x^2}}$$

$$= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{7dx^7} - \frac{2c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{35dx^5} - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \left(-\frac{5}{x^4}+\frac{8c^2}{x^3}-\frac{c^4}{x^2}-\frac{2c^6}{x}\right)dx,x,x^2\right)}{70\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}} + \frac{2bc^3d\sqrt{d-c^2dx^2}}{35x^4\sqrt{1-c^2x^2}} - \frac{bc^5d\sqrt{d-c^2dx^2}}{70x^2\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{7dx^7} - \frac{2c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{35dx^5} + \frac{2bc^7d\sqrt{d-c^2dx^2}\log(x)}{35\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 198, normalized size of antiderivative = 0.86

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^8}\,dx =$$

$$-\frac{d\sqrt{d-c^2dx^2}\left(25bcx-60bc^3x^3+15bc^5x^5+147bc^7x^7+150a\sqrt{1-c^2x^2}-240ac^2x^2\sqrt{1-c^2x^2}+30ac^4x^4\sqrt{\right.}}{1050x^7\sqrt{1-c^2x}}$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] -1/1050*(d*Sqrt[d - c^2*d*x^2]*(25*b*c*x - 60*b*c^3*x^3 + 15*b*c^5*x^5 + 14
7*b*c^7*x^7 + 150*a*Sqrt[1 - c^2*x^2] - 240*a*c^2*x^2*Sqrt[1 - c^2*x^2] + 3
0*a*c^4*x^4*Sqrt[1 - c^2*x^2] + 60*a*c^6*x^6*Sqrt[1 - c^2*x^2] + 30*b*(1 -
c^2*x^2)^(5/2)*(5 + 2*c^2*x^2)*ArcSin[c*x] - 60*b*c^7*x^7*Log[x]))/(x^7*Sqr
t[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.25 (sec) , antiderivative size = 3384, normalized size of antiderivative = 14.65

method	result	size
default	Expression too large to display	3384
parts	Expression too large to display	3384

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^8,x,method=_RETURNVERBOSE)
```

```
[Out] 26/105*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154
*c^4*x^4-105*c^2*x^2+25)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^14-116/105*I*b*(-d*
(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^
2*x^2+25)*x^5/(c^2*x^2-1)*(-c^2*x^2+1)*c^12+20/21*I*b*(-d*(c^2*x^2-1))^(1/2
)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^3/(c^
2*x^2-1)*(-c^2*x^2+1)*c^10-2*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*
c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^10/(c^2*x^2-1)*(-c^2*x^2+1
)^(1/2)*arcsin(c*x)*c^17+2*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^
8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^8/(c^2*x^2-1)*(-c^2*x^2+1)^(
1/2)*arcsin(c*x)*c^15+4*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x
^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2
)*arcsin(c*x)*c^13-44/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x
^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2
)*arcsin(c*x)*c^11+6*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-
70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*a
rcsin(c*x)*c^9+a*(-1/7/d/x^7*(-c^2*d*x^2+d)^(5/2)-2/35*c^2/d/x^5*(-c^2*d*x^
2+d)^(5/2))+25/7*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6
*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^7/(c^2*x^2-1)*arcsin(c*x)-2/35*b*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2)
)^2-1)*c^7*d-359/30*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*
c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/(c^2*x^2-1)*c^7*(-c^2*x^2+1)^(1/2)-142/
105*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^
4*x^4-105*c^2*x^2+25)*x^7/(c^2*x^2-1)*c^14+11/6*b*(-d*(c^2*x^2-1))^(1/2)*d/
(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^4/(c^2*x^
2-1)*(-c^2*x^2+1)^(1/2)*c^11+52/5*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-
35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^3/(c^2*x^2-1)*arcsin(c*
```

x)*c^10+161/30*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^2/(c^2*x^2-1)*c^9*(-c^2*x^2+1)^(1/2)+1966/35*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x/(c^2*x^2-1)*arcsin(c*x)*c^8-3272/35*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x/(c^2*x^2-1)*arcsin(c*x)*c^6+421/42*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^2/(c^2*x^2-1)*c^5*(-c^2*x^2+1)^(1/2)+472/7*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^4-2*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^11/(c^2*x^2-1)*arcsin(c*x)*c^18+3*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^9/(c^2*x^2-1)*arcsin(c*x)*c^16+1/2*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^8/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^15-55/14*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^4/(c^2*x^2-1)*c^3*(-c^2*x^2+1)^(1/2)-170/7*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^5/(c^2*x^2-1)*arcsin(c*x)*c^2+25/42*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c-164/5*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^12+12*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^7/(c^2*x^2-1)*arcsin(c*x)*c^14-5/2*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^13+72/35*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^5/(c^2*x^2-1)*c^12-25/21*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^3/(c^2*x^2-1)*c^10+5/21*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x/(c^2*x^2-1)*c^8+4*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^7*d/(35*c^2*x^2-35)-2/35*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^13/(c^2*x^2-1)*c^20+9/35*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^11/(c^2*x^2-1)*c^18+1/21*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^9/(c^2*x^2-1)*c^16-10/7*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^7-5/21*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^8-2/35*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^11/(c^2*x^2-1)*(-c^2*x^2+1)*c^18+1/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(35*c^10*x^10-35*c^8*x^8-70*c^6*x^6+154*c^4*x^4-105*c^2*x^2+25)*x^9/(c^2*x^2-1)*(-c^2*x^2+1)*c^16

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 599, normalized size of antiderivative = 2.59

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^8}\,dx = \left[\frac{6\,(bc^9dx^9-bc^7dx^7)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4-\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}(x^4-1)}{c^2x^4-x^2}\right.}{}\right.$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="fricas")
```

```
[Out] [1/210*(6*(b*c^9*d*x^9 - b*c^7*d*x^7)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 -
d*x^4 - sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2
*x^4 - x^2)) + (3*b*c^5*d*x^5 - (3*b*c^5 - 12*b*c^3 + 5*b*c)*d*x^7 - 12*b*c
^3*d*x^3 + 5*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 6*(2*a*c^8*
d*x^8 - a*c^6*d*x^6 - 9*a*c^4*d*x^4 + 13*a*c^2*d*x^2 - 5*a*d + (2*b*c^8*d*x
^8 - b*c^6*d*x^6 - 9*b*c^4*d*x^4 + 13*b*c^2*d*x^2 - 5*b*d)*arcsin(c*x))*sqr
t(-c^2*d*x^2 + d))/(c^2*x^9 - x^7), 1/210*(12*(b*c^9*d*x^9 - b*c^7*d*x^7)*s
qrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(
c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) + (3*b*c^5*d*x^5 - (3*b*c^5 - 12*b*c^3 +
5*b*c)*d*x^7 - 12*b*c^3*d*x^3 + 5*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x
^2 + 1) - 6*(2*a*c^8*d*x^8 - a*c^6*d*x^6 - 9*a*c^4*d*x^4 + 13*a*c^2*d*x^2 -
 5*a*d + (2*b*c^8*d*x^8 - b*c^6*d*x^6 - 9*b*c^4*d*x^4 + 13*b*c^2*d*x^2 - 5*
b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^9 - x^7)]
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^8}\,dx = \int \frac{(-d(cx-1)\,(cx+1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))}{x^8}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**8,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**8, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 151, normalized size of antiderivative = 0.65

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^8}\,dx = \frac{1}{210}\left(12\,c^6d^{\frac{3}{2}}\log\left(x\right) - \frac{3\,c^4d^{\frac{3}{2}}x^4 - 12\,c^2d^{\frac{3}{2}}x^2 + 5\,d^{\frac{3}{2}}}{x^6}\right)bc - \frac{1}{35}\,b\left(\frac{2\left(-c^2dx^2+d\right)^{\frac{5}{2}}c^2}{dx^5} + \frac{5\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{dx^7}\right)\arcsin\left(cx\right) - \frac{1}{35}\,a\left(\frac{2\left(-c^2dx^2+d\right)^{\frac{5}{2}}c^2}{dx^5} + \frac{5\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{dx^7}\right)$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="maxima")
```

```
[Out] 1/210*(12*c^6*d^(3/2)*log(x) - (3*c^4*d^(3/2)*x^4 - 12*c^2*d^(3/2)*x^2 + 5*
d^(3/2))/x^6)*b*c - 1/35*b*(2*(-c^2*d*x^2 + d)^(5/2)*c^2/(d*x^5) + 5*(-c^2*
d*x^2 + d)^(5/2)/(d*x^7))*arcsin(c*x) - 1/35*a*(2*(-c^2*d*x^2 + d)^(5/2)*c^
2/(d*x^5) + 5*(-c^2*d*x^2 + d)^(5/2)/(d*x^7))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^8}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^8}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}}{x^8}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^8,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^8, x)
```

3.75 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^{10}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 308

$$\begin{aligned}\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^{10}}\,dx &= -\frac{bcd\sqrt{d-c^2dx^2}}{72x^8\sqrt{1-c^2x^2}} \\ &+ \frac{5bc^3d\sqrt{d-c^2dx^2}}{189x^6\sqrt{1-c^2x^2}} - \frac{bc^5d\sqrt{d-c^2dx^2}}{420x^4\sqrt{1-c^2x^2}} - \frac{2bc^7d\sqrt{d-c^2dx^2}}{315x^2\sqrt{1-c^2x^2}} \\ &- \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{9dx^9} - \frac{4c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{63dx^7} \\ &- \frac{8c^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{315dx^5} + \frac{8bc^9d\sqrt{d-c^2dx^2}\log(x)}{315\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] -1/9*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/d/x^9-4/63*c^2*(-c^2*d*x^2+d)^(
5/2)*(a+b*arcsin(c*x))/d/x^7-8/315*c^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x
))/d/x^5-1/72*b*c*d*(-c^2*d*x^2+d)^(1/2)/x^8/(-c^2*x^2+1)^(1/2)+5/189*b*c^3
*d*(-c^2*d*x^2+d)^(1/2)/x^6/(-c^2*x^2+1)^(1/2)-1/420*b*c^5*d*(-c^2*d*x^2+d)
^(1/2)/x^4/(-c^2*x^2+1)^(1/2)-2/315*b*c^7*d*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*
x^2+1)^(1/2)+8/315*b*c^9*d*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 308, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used

= {277, 270, 4779, 12, 1265, 907}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^{10}}\,dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{9dx^9} - \frac{4c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{63dx^7} - \frac{8c^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{315dx^5} - \frac{bcd\sqrt{d-c^2dx^2}}{72x^8\sqrt{1-c^2x^2}} + \frac{8bc^9d\log(x)\sqrt{d-c^2dx^2}}{315\sqrt{1-c^2x^2}} - \frac{2bc^7d\sqrt{d-c^2dx^2}}{315x^2\sqrt{1-c^2x^2}} - \frac{bc^5d\sqrt{d-c^2dx^2}}{420x^4\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{189x^6\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^10,x]
```

```
[Out] -1/72*(b*c*d*Sqrt[d - c^2*d*x^2])/(x^8*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d*Sqrt
[d - c^2*d*x^2])/(189*x^6*Sqrt[1 - c^2*x^2]) - (b*c^5*d*Sqrt[d - c^2*d*x^2]
)/(420*x^4*Sqrt[1 - c^2*x^2]) - (2*b*c^7*d*Sqrt[d - c^2*d*x^2])/(315*x^2*Sq
rt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(9*d*x^9) -
(4*c^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(63*d*x^7) - (8*c^4*(d -
c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(315*d*x^5) + (8*b*c^9*d*Sqrt[d - c^2
*d*x^2]*Log[x])/(315*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
```

)

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{9dx^9}-\frac{4c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{63dx^7} \\
&\quad -\frac{8c^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{315dx^5} \\
&\quad -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{d(1-c^2x^2)^2(-35-20c^2x^2-8c^4x^4)}{315x^9}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{9dx^9}-\frac{4c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{63dx^7} \\
&\quad -\frac{8c^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{315dx^5}-\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\frac{(1-c^2x^2)^2(-35-20c^2x^2-8c^4x^4)}{x^9}\,dx}{315\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{9dx^9}-\frac{4c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{63dx^7} \\
&\quad -\frac{8c^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{315dx^5} \\
&\quad -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{(1-c^2x)^2(-35-20c^2x-8c^4x^2)}{x^5}\,dx,x,x^2\right)}{630\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{9dx^9} - \frac{4c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{63dx^7} - \frac{8c^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{315dx^5} - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(-\frac{35}{x^5}+\frac{50c^2}{x^4}-\frac{3c^4}{x^3}-\frac{4c^6}{x^2}-\frac{8c^8}{x}\right)dx,x,x^2\right)}{630\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{72x^8\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{189x^6\sqrt{1-c^2x^2}} - \frac{bc^5d\sqrt{d-c^2dx^2}}{420x^4\sqrt{1-c^2x^2}} - \frac{2bc^7d\sqrt{d-c^2dx^2}}{315x^2\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{9dx^9} - \frac{4c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{63dx^7} - \frac{8c^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{315dx^5} + \frac{8bc^9d\sqrt{d-c^2dx^2}\log(x)}{315\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.38 (sec) , antiderivative size = 238, normalized size of antiderivative = 0.77

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^{10}}\,dx = -\frac{d\sqrt{d-c^2dx^2}\left(3675bcx-7000bc^3x^3+630bc^5x^5+1680bc^7x^7+18264bc^9x^9+29400a\sqrt{1-c^2x^2}-42000ac\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^10,x]
```

```
[Out] -1/264600*(d*Sqrt[d - c^2*d*x^2]*(3675*b*c*x - 7000*b*c^3*x^3 + 630*b*c^5*x
^5 + 1680*b*c^7*x^7 + 18264*b*c^9*x^9 + 29400*a*Sqrt[1 - c^2*x^2] - 42000*a
*c^2*x^2*Sqrt[1 - c^2*x^2] + 2520*a*c^4*x^4*Sqrt[1 - c^2*x^2] + 3360*a*c^6*
x^6*Sqrt[1 - c^2*x^2] + 6720*a*c^8*x^8*Sqrt[1 - c^2*x^2] + 840*b*(1 - c^2*x
^2)^(5/2)*(35 + 20*c^2*x^2 + 8*c^4*x^4)*ArcSin[c*x] - 6720*b*c^9*x^9*Log[x]
))/(x^9*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.30 (sec) , antiderivative size = 4563, normalized size of antiderivative = 14.81

method	result	size
default	Expression too large to display	4563
parts	Expression too large to display	4563

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^10,x,method=_RETURNVERBOSE)
```

```
[Out] 1225/9*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-
2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)/x^9/(c^2*x^2-1)*arcsin(c*x)-8/
315*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2
*x^2+1)^(1/2))^2-1)*c^9*d+30055/504*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^
12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)/(
c^2*x^2-1)*c^9*(-c^2*x^2+1)^(1/2)-2189/189*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(84
0*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^
2+1225)*x^5/(c^2*x^2-1)*(-c^2*x^2+1)*c^14+350/27*I*b*(-d*(c^2*x^2-1))^(1/2)
*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*
c^2*x^2+1225)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^12-35/9*I*b*(-d*(c^2*x^2-1))^(
1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4
725*c^2*x^2+1225)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^10+24*I*b*(-d*(c^2*x^2-1))^(
1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4
725*c^2*x^2+1225)*x^10/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^19-24/5
*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730
*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^8/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)
*arcsin(c*x)*c^17+208/3*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^1
0*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^6/(c^2*x^
2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^15-1104/7*I*b*(-d*(c^2*x^2-1))^(1/2)*
d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c
^2*x^2+1225)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^13+120*I*b*(-
d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^
6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin
(c*x)*c^11-64/3*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+1
89*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^12/(c^2*x^2-1)*(-
c^2*x^2+1)^(1/2)*arcsin(c*x)*c^21-128/315*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840
*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2
+1225)*x^15/(c^2*x^2-1)*(-c^2*x^2+1)*c^24-280/9*I*b*(-d*(c^2*x^2-1))^(1/2)*
d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c
^2*x^2+1225)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^9-16/45*I*b*(-d*(
c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6
210*c^4*x^4-4725*c^2*x^2+1225)*x^13/(c^2*x^2-1)*(-c^2*x^2+1)*c^22+1384/945*
I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*
c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^11/(c^2*x^2-1)*(-c^2*x^2+1)*c^20+
2306/945*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*
x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^9/(c^2*x^2-1)*(-c^2*x^2+
1)*c^18-40/63*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189
*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^7/(c^2*x^2-1)*(-c^2
*x^2+1)*c^16+a*(-1/9/d/x^9*(-c^2*d*x^2+d)^(5/2)+4/9*c^2*(-1/7/d/x^7*(-c^2*d
*x^2+d)^(5/2)-2/35*c^2/d/x^5*(-c^2*d*x^2+d)^(5/2)))+113594/63*b*(-d*(c^2*x^
2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^
4*x^4-4725*c^2*x^2+1225)/x/(c^2*x^2-1)*arcsin(c*x)*c^8-25915/126*b*(-d*(c^2
*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210
*c^4*x^4-4725*c^2*x^2+1225)/x^2/(c^2*x^2-1)*c^7*(-c^2*x^2+1)^(1/2)-174520/6
3*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*
```

```
c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^6-64/
3*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*
c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^13/(c^2*x^2-1)*arcsin(c*x)*c^22+1
04/3*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-27
30*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^11/(c^2*x^2-1)*arcsin(c*x)*c^2
0+922/945*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8
*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^11/(c^2*x^2-1)*c^20-290
6/945*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8
-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^9/(c^2*x^2-1)*c^18-455/27*I
*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c
^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^3/(c^2*x^2-1)*c^12+35/9*I*b*(-d*(c
^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+62
10*c^4*x^4-4725*c^2*x^2+1225)*x/(c^2*x^2-1)*c^10+16*I*b*(-d*(c^2*x^2-1))^(1
/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^9*d/(315*c^2*x^2-315)+1285/6*b*(-d*(c^
2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+621
0*c^4*x^4-4725*c^2*x^2+1225)/x^4/(c^2*x^2-1)*c^5*(-c^2*x^2+1)^(1/2)+19540/9
*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c
^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)/x^5/(c^2*x^2-1)*arcsin(c*x)*c^4-2117
5/216*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2
730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)/x^6/(c^2*x^2-1)*c^3*(-c^2*x^2+1
)^(1/2)-7700/9*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*
c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)/x^7/(c^2*x^2-1)*arcsin
(c*x)*c^2+1225/72*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+1
89*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)/x^8/(c^2*x^2-1)*(-c
^2*x^2+1)^(1/2)*c+16/3*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x
^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^10/(c^2*x^2-
1)*(-c^2*x^2+1)^(1/2)*c^19-212/15*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12
-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^9
/(c^2*x^2-1)*arcsin(c*x)*c^18+59884/105*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^1
2*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+122
5)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^12+829/56*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*
c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+
1225)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^11-43264/63*b*(-d*(c^2*x^2-1))^(
1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4
725*c^2*x^2+1225)*x/(c^2*x^2-1)*arcsin(c*x)*c^10+4639/189*I*b*(-d*(c^2*x^2-
1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*
x^4-4725*c^2*x^2+1225)*x^5/(c^2*x^2-1)*c^14-4*b*(-d*(c^2*x^2-1))^(1/2)*d/(8
40*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x
^2+1225)*x^8/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^17+3151/15*b*(-d*(c^2*x^2-1))
^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4
-4725*c^2*x^2+1225)*x^7/(c^2*x^2-1)*arcsin(c*x)*c^16-4189/180*b*(-d*(c^2*x^
2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^6*x^6+6210*c^
4*x^4-4725*c^2*x^2+1225)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^15-60632/105*
b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*c^
6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^14+1187
```

```
/60*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-273
0*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2
)*c^13+344/189*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+18
9*c^8*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^13/(c^2*x^2-1)*c^2
2-128/315*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8
*x^8-2730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^17/(c^2*x^2-1)*c^26+16/
315*I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2
730*c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^15/(c^2*x^2-1)*c^24-2069/189*
I*b*(-d*(c^2*x^2-1))^(1/2)*d/(840*c^12*x^12-945*c^10*x^10+189*c^8*x^8-2730*
c^6*x^6+6210*c^4*x^4-4725*c^2*x^2+1225)*x^7/(c^2*x^2-1)*c^16
```

Fricas [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 671, normalized size of antiderivative = 2.18

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^{10}}\,dx = \left[\frac{96\,(bc^{11}dx^{11}-bc^9dx^9)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4-\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}(x^4}{c^2x^4-x^2}\right.}{}\right.$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="fricas"
)
```

```
[Out] [1/7560*(96*(b*c^11*d*x^11 - b*c^9*d*x^9)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^
2 - d*x^4 - sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/
(c^2*x^4 - x^2)) + (48*b*c^7*d*x^7 + 18*b*c^5*d*x^5 - (48*b*c^7 + 18*b*c^5
- 200*b*c^3 + 105*b*c)*d*x^9 - 200*b*c^3*d*x^3 + 105*b*c*d*x)*sqrt(-c^2*d*x
^2 + d)*sqrt(-c^2*x^2 + 1) - 24*(8*a*c^10*d*x^10 - 4*a*c^8*d*x^8 - a*c^6*d*
x^6 - 53*a*c^4*d*x^4 + 85*a*c^2*d*x^2 - 35*a*d + (8*b*c^10*d*x^10 - 4*b*c^8
*d*x^8 - b*c^6*d*x^6 - 53*b*c^4*d*x^4 + 85*b*c^2*d*x^2 - 35*b*d)*arcsin(c*x
))*sqrt(-c^2*d*x^2 + d))/(c^2*x^11 - x^9), 1/7560*(192*(b*c^11*d*x^11 - b*c
^9*d*x^9)*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)
*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) + (48*b*c^7*d*x^7 + 18*b*c^5*d
*x^5 - (48*b*c^7 + 18*b*c^5 - 200*b*c^3 + 105*b*c)*d*x^9 - 200*b*c^3*d*x^3
+ 105*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 24*(8*a*c^10*d*x^1
0 - 4*a*c^8*d*x^8 - a*c^6*d*x^6 - 53*a*c^4*d*x^4 + 85*a*c^2*d*x^2 - 35*a*d
+ (8*b*c^10*d*x^10 - 4*b*c^8*d*x^8 - b*c^6*d*x^6 - 53*b*c^4*d*x^4 + 85*b*c^
2*d*x^2 - 35*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^11 - x^9)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^{10}}\,dx = \text{Timed out}$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**10,x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 210, normalized size of antiderivative = 0.68

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^{10}}\,dx = \frac{1}{7560}\left(192\,c^8d^{\frac{3}{2}}\log(x) - \frac{48\,c^6d^{\frac{3}{2}}x^6 + 18\,c^4d^{\frac{3}{2}}x^4 - 200\,c^2d^{\frac{3}{2}}x^2 + 10\right.$$
$$- \frac{1}{315}\,b\left(\frac{8\left(-c^2dx^2+d\right)^{\frac{5}{2}}c^4}{dx^5} + \frac{20\left(-c^2dx^2+d\right)^{\frac{5}{2}}c^2}{dx^7} + \frac{35\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{dx^9}\right)\arcsin(cx)$$
$$- \frac{1}{315}\,a\left(\frac{8\left(-c^2dx^2+d\right)^{\frac{5}{2}}c^4}{dx^5} + \frac{20\left(-c^2dx^2+d\right)^{\frac{5}{2}}c^2}{dx^7} + \frac{35\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{dx^9}\right)$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="maxima"
)
[Out] 1/7560*(192*c^8*d^(3/2)*log(x) - (48*c^6*d^(3/2)*x^6 + 18*c^4*d^(3/2)*x^4 -
 200*c^2*d^(3/2)*x^2 + 105*d^(3/2))/x^8)*b*c - 1/315*b*(8*(-c^2*d*x^2 + d)^
(5/2)*c^4/(d*x^5) + 20*(-c^2*d*x^2 + d)^(5/2)*c^2/(d*x^7) + 35*(-c^2*d*x^2
+ d)^(5/2)/(d*x^9))*arcsin(c*x) - 1/315*a*(8*(-c^2*d*x^2 + d)^(5/2)*c^4/(d*
x^5) + 20*(-c^2*d*x^2 + d)^(5/2)*c^2/(d*x^7) + 35*(-c^2*d*x^2 + d)^(5/2)/(d
*x^9))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^{10}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^{10}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}}{x^{10}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^10,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^10, x)
```

3.76 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^{12}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 385

$$\begin{aligned}\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^{12}}\,dx = &-\frac{bcd\sqrt{d-c^2dx^2}}{110x^{10}\sqrt{1-c^2x^2}} \\ &+\frac{bc^3d\sqrt{d-c^2dx^2}}{66x^8\sqrt{1-c^2x^2}}-\frac{bc^5d\sqrt{d-c^2dx^2}}{1386x^6\sqrt{1-c^2x^2}}-\frac{bc^7d\sqrt{d-c^2dx^2}}{770x^4\sqrt{1-c^2x^2}} \\ &-\frac{4bc^9d\sqrt{d-c^2dx^2}}{1155x^2\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{11dx^{11}} \\ &-\frac{2c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{33dx^9}-\frac{8c^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{231dx^7} \\ &-\frac{16c^6(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{1155dx^5}+\frac{16bc^{11}d\sqrt{d-c^2dx^2}\log(x)}{1155\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] -1/11*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/d/x^11-2/33*c^2*(-c^2*d*x^2+d)
^(5/2)*(a+b*arcsin(c*x))/d/x^9-8/231*c^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c
*x))/d/x^7-16/1155*c^6*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/d/x^5-1/110*b
*c*d*(-c^2*d*x^2+d)^(1/2)/x^10/(-c^2*x^2+1)^(1/2)+1/66*b*c^3*d*(-c^2*d*x^2+
d)^(1/2)/x^8/(-c^2*x^2+1)^(1/2)-1/1386*b*c^5*d*(-c^2*d*x^2+d)^(1/2)/x^6/(-c
^2*x^2+1)^(1/2)-1/770*b*c^7*d*(-c^2*d*x^2+d)^(1/2)/x^4/(-c^2*x^2+1)^(1/2)-4
/1155*b*c^9*d*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)+16/1155*b*c^11*d*
ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 385, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {277, 270, 4779, 12, 1813, 1634}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^{12}}\,dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{11dx^{11}} - \frac{2c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{33dx^9} - \frac{16c^6(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{1155dx^5} - \frac{8c^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{231dx^7} - \frac{bcd\sqrt{d-c^2dx^2}}{110x^{10}\sqrt{1-c^2x^2}} + \frac{16bc^{11}d\log(x)\sqrt{d-c^2dx^2}}{1155\sqrt{1-c^2x^2}} - \frac{4bc^9d\sqrt{d-c^2dx^2}}{1155x^2\sqrt{1-c^2x^2}} - \frac{bc^7d\sqrt{d-c^2dx^2}}{770x^4\sqrt{1-c^2x^2}} - \frac{bc^5d\sqrt{d-c^2dx^2}}{1386x^6\sqrt{1-c^2x^2}} + \frac{bc^3d\sqrt{d-c^2dx^2}}{66x^8\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^12,x]
```

```
[Out] -1/110*(b*c*d*Sqrt[d - c^2*d*x^2])/(x^10*Sqrt[1 - c^2*x^2]) + (b*c^3*d*Sqrt
[d - c^2*d*x^2])/(66*x^8*Sqrt[1 - c^2*x^2]) - (b*c^5*d*Sqrt[d - c^2*d*x^2])
/(1386*x^6*Sqrt[1 - c^2*x^2]) - (b*c^7*d*Sqrt[d - c^2*d*x^2])/(770*x^4*Sqrt
[1 - c^2*x^2]) - (4*b*c^9*d*Sqrt[d - c^2*d*x^2])/(1155*x^2*Sqrt[1 - c^2*x^2
]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(11*d*x^11) - (2*c^2*(d -
c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(33*d*x^9) - (8*c^4*(d - c^2*d*x^2)^(
5/2)*(a + b*ArcSin[c*x]))/(231*d*x^7) - (16*c^6*(d - c^2*d*x^2)^(5/2)*(a +
b*ArcSin[c*x]))/(1155*d*x^5) + (16*b*c^11*d*Sqrt[d - c^2*d*x^2]*Log[x])/(11
55*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
```

```
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{11dx^{11}}-\frac{2c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{33dx^9} \\
&\quad -\frac{8c^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{231dx^7}-\frac{16c^6(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{1155dx^5} \\
&\quad -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{d(1-c^2x^2)^2(-105-70c^2x^2-40c^4x^4-16c^6x^6)}{1155x^{11}}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{11dx^{11}}-\frac{2c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{33dx^9} \\
&\quad -\frac{8c^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{231dx^7}-\frac{16c^6(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{1155dx^5} \\
&\quad -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\frac{(1-c^2x^2)^2(-105-70c^2x^2-40c^4x^4-16c^6x^6)}{x^{11}}\,dx}{1155\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{11dx^{11}} - \frac{2c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{33dx^9} - \frac{8c^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{231dx^7} - \frac{16c^6(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{1155dx^5} - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{(1-c^2x)^2(-105-70c^2x-40c^4x^2-16c^6x^3)}{x^6}dx, x, x^2\right)}{2310\sqrt{1-c^2x^2}}$$

$$= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{11dx^{11}} - \frac{2c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{33dx^9} - \frac{8c^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{231dx^7} - \frac{16c^6(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{1155dx^5} - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \left(-\frac{105}{x^6}+\frac{140c^2}{x^5}-\frac{5c^4}{x^4}-\frac{6c^6}{x^3}-\frac{8c^8}{x^2}-\frac{16c^{10}}{x}\right)dx, x, x^2\right)}{2310\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{110x^{10}\sqrt{1-c^2x^2}} + \frac{bc^3d\sqrt{d-c^2dx^2}}{66x^8\sqrt{1-c^2x^2}} - \frac{bc^5d\sqrt{d-c^2dx^2}}{1386x^6\sqrt{1-c^2x^2}} - \frac{bc^7d\sqrt{d-c^2dx^2}}{770x^4\sqrt{1-c^2x^2}} - \frac{4bc^9d\sqrt{d-c^2dx^2}}{1155x^2\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{11dx^{11}} - \frac{2c^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{33dx^9} - \frac{8c^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{231dx^7} - \frac{16c^6(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{1155dx^5} + \frac{16bc^{11}d\sqrt{d-c^2dx^2}\log(x)}{1155\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 278, normalized size of antiderivative = 0.72

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^{12}}dx = -\frac{d\sqrt{d-c^2dx^2}\left(6615bcx - 11025bc^3x^3 + 525bc^5x^5 + 945bc^7x^7 + 2520bc^9x^9 + 29524bc^{11}x^{11} + 66150a\sqrt{1-c^2}\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^12,x]
```

```
[Out] -1/727650*(d*Sqrt[d - c^2*d*x^2]*(6615*b*c*x - 11025*b*c^3*x^3 + 525*b*c^5*
x^5 + 945*b*c^7*x^7 + 2520*b*c^9*x^9 + 29524*b*c^11*x^11 + 66150*a*Sqrt[1 -
 c^2*x^2] - 88200*a*c^2*x^2*Sqrt[1 - c^2*x^2] + 3150*a*c^4*x^4*Sqrt[1 - c^2
*x^2] + 3780*a*c^6*x^6*Sqrt[1 - c^2*x^2] + 5040*a*c^8*x^8*Sqrt[1 - c^2*x^2]
 + 10080*a*c^10*x^10*Sqrt[1 - c^2*x^2] + 630*b*(1 - c^2*x^2)^(5/2)*(105 + 7
0*c^2*x^2 + 40*c^4*x^4 + 16*c^6*x^6)*ArcSin[c*x] - 10080*b*c^11*x^11*Log[x]
))/(x^11*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.39 (sec) , antiderivative size = 5886, normalized size of antiderivative = 15.29

method	result	size
default	Expression too large to display	5886
parts	Expression too large to display	5886

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^12,x,method=_RETURNVERBOSE)
[Out] result too large to display
```

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 743, normalized size of antiderivative = 1.93

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^{12}}\,dx = \left[\frac{48\,(bc^{13}dx^{13}-bc^{11}dx^{11})\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4-\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+}}{c^2x^4-x^2}\right.}{}\right.$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="fricas"
)
[Out] [1/6930*(48*(b*c^13*d*x^13 - b*c^11*d*x^11)*sqrt(d)*log((c^2*d*x^6 + c^2*d*
x^2 - d*x^4 - sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d
)/(c^2*x^4 - x^2)) + (24*b*c^9*d*x^9 + 9*b*c^7*d*x^7 - (24*b*c^9 + 9*b*c^7
+ 5*b*c^5 - 105*b*c^3 + 63*b*c)*d*x^11 + 5*b*c^5*d*x^5 - 105*b*c^3*d*x^3 +
63*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 6*(16*a*c^12*d*x^12 -
 8*a*c^10*d*x^10 - 2*a*c^8*d*x^8 - a*c^6*d*x^6 - 145*a*c^4*d*x^4 + 245*a*c^
2*d*x^2 - 105*a*d + (16*b*c^12*d*x^12 - 8*b*c^10*d*x^10 - 2*b*c^8*d*x^8 - b
*c^6*d*x^6 - 145*b*c^4*d*x^4 + 245*b*c^2*d*x^2 - 105*b*d)*arcsin(c*x))*sqrt
(-c^2*d*x^2 + d))/(c^2*x^13 - x^11), 1/6930*(96*(b*c^13*d*x^13 - b*c^11*d*x
^11)*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt
(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) + (24*b*c^9*d*x^9 + 9*b*c^7*d*x^7 -
 (24*b*c^9 + 9*b*c^7 + 5*b*c^5 - 105*b*c^3 + 63*b*c)*d*x^11 + 5*b*c^5*d*x^5
 - 105*b*c^3*d*x^3 + 63*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) -
6*(16*a*c^12*d*x^12 - 8*a*c^10*d*x^10 - 2*a*c^8*d*x^8 - a*c^6*d*x^6 - 145*a
*c^4*d*x^4 + 245*a*c^2*d*x^2 - 105*a*d + (16*b*c^12*d*x^12 - 8*b*c^10*d*x^1
0 - 2*b*c^8*d*x^8 - b*c^6*d*x^6 - 145*b*c^4*d*x^4 + 245*b*c^2*d*x^2 - 105*b
*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^13 - x^11)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d - c^2dx^2)^{3/2} (a + b \arcsin(cx))}{x^{12}} dx = \text{Timed out}$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**12,x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 269, normalized size of antiderivative = 0.70

$$\int \frac{(d - c^2dx^2)^{3/2} (a + b \arcsin(cx))}{x^{12}} dx = \frac{1}{6930} \left(96\, c^{10} d^{\frac{3}{2}} \log(x) - \frac{24\, c^8 d^{\frac{3}{2}} x^8 + 9\, c^6 d^{\frac{3}{2}} x^6 + 5\, c^4 d^{\frac{3}{2}} x^4 - 105\, c^2 d}{x^{10}}\right.$$
$$- \frac{1}{1155} \left(\frac{16 (-c^2dx^2 + d)^{\frac{5}{2}} c^6}{dx^5} + \frac{40 (-c^2dx^2 + d)^{\frac{5}{2}} c^4}{dx^7} + \frac{70 (-c^2dx^2 + d)^{\frac{5}{2}} c^2}{dx^9} + \frac{105 (-c^2dx^2 + d)^{\frac{5}{2}}}{dx^{11}}\right) b \arcsin(c$$
$$- \frac{1}{1155} \left(\frac{16 (-c^2dx^2 + d)^{\frac{5}{2}} c^6}{dx^5} + \frac{40 (-c^2dx^2 + d)^{\frac{5}{2}} c^4}{dx^7} + \frac{70 (-c^2dx^2 + d)^{\frac{5}{2}} c^2}{dx^9} + \frac{105 (-c^2dx^2 + d)^{\frac{5}{2}}}{dx^{11}}\right) a$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="maxima"
)
[Out] 1/6930*(96*c^10*d^(3/2)*log(x) - (24*c^8*d^(3/2)*x^8 + 9*c^6*d^(3/2)*x^6 +
5*c^4*d^(3/2)*x^4 - 105*c^2*d^(3/2)*x^2 + 63*d^(3/2))/x^10)*b*c - 1/1155*(1
6*(-c^2*d*x^2 + d)^(5/2)*c^6/(d*x^5) + 40*(-c^2*d*x^2 + d)^(5/2)*c^4/(d*x^7
) + 70*(-c^2*d*x^2 + d)^(5/2)*c^2/(d*x^9) + 105*(-c^2*d*x^2 + d)^(5/2)/(d*x
^11))*b*arcsin(c*x) - 1/1155*(16*(-c^2*d*x^2 + d)^(5/2)*c^6/(d*x^5) + 40*(-
c^2*d*x^2 + d)^(5/2)*c^4/(d*x^7) + 70*(-c^2*d*x^2 + d)^(5/2)*c^2/(d*x^9) +
105*(-c^2*d*x^2 + d)^(5/2)/(d*x^11))*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d - c^2dx^2)^{3/2} (a + b \arcsin(cx))}{x^{12}} dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^{12}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}}{x^{12}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^12,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^12, x)
```

3.77 $\int x^7(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 375

$$\int x^7\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\frac{16bdx\sqrt{d-c^2dx^2}}{1155c^7\sqrt{1-c^2x^2}}+\frac{8bdx^3\sqrt{d-c^2dx^2}}{3465c^5\sqrt{1-c^2x^2}}+\frac{2bdx^5\sqrt{d-c^2dx^2}}{1925c^3\sqrt{1-c^2x^2}}+\frac{bdx^7\sqrt{d-c^2dx^2}}{1617c\sqrt{1-c^2x^2}}-\frac{4bcdx^9\sqrt{d-c^2dx^2}}{297\sqrt{1-c^2x^2}}+\frac{bc^3dx^{11}\sqrt{d-c^2dx^2}}{121\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{5c^8d}+\frac{3\left(d-c^2dx^2\right)^{7/2}(a+b\arcsin(cx))}{7c^8d^2}-\frac{\left(d-c^2dx^2\right)^{9/2}(a+b\arcsin(cx))}{3c^8d^3}+\frac{\left(d-c^2dx^2\right)^{11/2}(a+b\arcsin(cx))}{11c^8d^4}$$

```
[Out] -1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/c^8/d+3/7*(-c^2*d*x^2+d)^(7/2)*
(a+b*arcsin(c*x))/c^8/d^2-1/3*(-c^2*d*x^2+d)^(9/2)*(a+b*arcsin(c*x))/c^8/d^
3+1/11*(-c^2*d*x^2+d)^(11/2)*(a+b*arcsin(c*x))/c^8/d^4+16/1155*b*d*x*(-c^2*
d*x^2+d)^(1/2)/c^7/(-c^2*x^2+1)^(1/2)+8/3465*b*d*x^3*(-c^2*d*x^2+d)^(1/2)/c
^5/(-c^2*x^2+1)^(1/2)+2/1925*b*d*x^5*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^
(1/2)+1/1617*b*d*x^7*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-4/297*b*c*d*
x^9*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/121*b*c^3*d*x^11*(-c^2*d*x^2+
d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 375, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {272, 45, 4779, 12, 1824}

$$\int x^7 (d-c^2dx^2)^{3/2} (a+b\arcsin(cx))\,dx = \frac{(d-c^2dx^2)^{11/2}(a+b\arcsin(cx))}{11c^8d^4} - \frac{(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{3c^8d^3} + \frac{3(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^8d^2} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^8d} - \frac{4bcdx^9\sqrt{d-c^2dx^2}}{297\sqrt{1-c^2x^2}} + \frac{bdx^7\sqrt{d-c^2dx^2}}{1617c\sqrt{1-c^2x^2}} + \frac{16bdx\sqrt{d-c^2dx^2}}{1155c^7\sqrt{1-c^2x^2}} + \frac{8bdx^3\sqrt{d-c^2dx^2}}{3465c^5\sqrt{1-c^2x^2}} + \frac{bc^3dx^{11}\sqrt{d-c^2dx^2}}{121\sqrt{1-c^2x^2}} + \frac{2bdx^5\sqrt{d-c^2dx^2}}{1925c^3\sqrt{1-c^2x^2}}$$

```
[In] Int[x^7*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (16*b*d*x*Sqrt[d - c^2*d*x^2])/(1155*c^7*Sqrt[1 - c^2*x^2]) + (8*b*d*x^3*Sq
rt[d - c^2*d*x^2])/(3465*c^5*Sqrt[1 - c^2*x^2]) + (2*b*d*x^5*Sqrt[d - c^2*d
*x^2])/(1925*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^7*Sqrt[d - c^2*d*x^2])/(1617*c
*Sqrt[1 - c^2*x^2]) - (4*b*c*d*x^9*Sqrt[d - c^2*d*x^2])/(297*Sqrt[1 - c^2*x
^2]) + (b*c^3*d*x^11*Sqrt[d - c^2*d*x^2])/(121*Sqrt[1 - c^2*x^2]) - ((d - c
^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^8*d) + (3*(d - c^2*d*x^2)^(7/2)*(
a + b*ArcSin[c*x]))/(7*c^8*d^2) - ((d - c^2*d*x^2)^(9/2)*(a + b*ArcSin[c*x]
))/(3*c^8*d^3) + ((d - c^2*d*x^2)^(11/2)*(a + b*ArcSin[c*x]))/(11*c^8*d^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1824

```
Int[(Pq_)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[Pq*
(a + b*x^2)^p, x], x] /; FreeQ[{a, b}, x] && PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^8d}+\frac{3(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^8d^2} \\
&\quad -\frac{(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{3c^8d^3}+\frac{(d-c^2dx^2)^{11/2}(a+b\arcsin(cx))}{11c^8d^4} \\
&\quad -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{d(1-c^2x^2)^2(-16-40c^2x^2-70c^4x^4-105c^6x^6)}{1155c^8}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^8d}+\frac{3(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^8d^2} \\
&\quad -\frac{(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{3c^8d^3}+\frac{(d-c^2dx^2)^{11/2}(a+b\arcsin(cx))}{11c^8d^4} \\
&\quad -\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)^2\left(-16-40c^2x^2-70c^4x^4-105c^6x^6\right)dx}{1155c^7\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^8d}+\frac{3(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^8d^2} \\
&\quad -\frac{(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{3c^8d^3}+\frac{(d-c^2dx^2)^{11/2}(a+b\arcsin(cx))}{11c^8d^4} \\
&\quad -\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int\left(-16-8c^2x^2-6c^4x^4-5c^6x^6+140c^8x^8-105c^{10}x^{10}\right)dx}{1155c^7\sqrt{1-c^2x^2}} \\
&= \frac{16bdx\sqrt{d-c^2dx^2}}{1155c^7\sqrt{1-c^2x^2}}+\frac{8bdx^3\sqrt{d-c^2dx^2}}{3465c^5\sqrt{1-c^2x^2}}+\frac{2bdx^5\sqrt{d-c^2dx^2}}{1925c^3\sqrt{1-c^2x^2}} \\
&\quad +\frac{bdx^7\sqrt{d-c^2dx^2}}{1617c\sqrt{1-c^2x^2}}-\frac{4bcdx^9\sqrt{d-c^2dx^2}}{297\sqrt{1-c^2x^2}}+\frac{bc^3dx^{11}\sqrt{d-c^2dx^2}}{121\sqrt{1-c^2x^2}} \\
&\quad -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^8d}+\frac{3(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^8d^2} \\
&\quad -\frac{(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{3c^8d^3}+\frac{(d-c^2dx^2)^{11/2}(a+b\arcsin(cx))}{11c^8d^4}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 174, normalized size of antiderivative = 0.46

$$\int x^7(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx = \frac{d\sqrt{d-c^2dx^2}\Big(-3465a(1-c^2x^2)^{5/2}(16+40c^2x^2+70c^4x^4+105c^6x^6)+bcx(55440+92$$

```
[In] Integrate[x^7*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(-3465*a*(1 - c^2*x^2)^(5/2)*(16 + 40*c^2*x^2 + 70*c
^4*x^4 + 105*c^6*x^6) + b*c*x*(55440 + 9240*c^2*x^2 + 4158*c^4*x^4 + 2475*c
^6*x^6 - 53900*c^8*x^8 + 33075*c^10*x^10) - 3465*b*(1 - c^2*x^2)^(5/2)*(16
+ 40*c^2*x^2 + 70*c^4*x^4 + 105*c^6*x^6)*ArcSin[c*x]))/(4002075*c^8*Sqrt[1
- c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.34 (sec) , antiderivative size = 1781, normalized size of antiderivative = 4.75

method	result	size
default	Expression too large to display	1781
parts	Expression too large to display	1781

```
[In] int(x^7*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/11*x^6*(-c^2*d*x^2+d)^(5/2)/c^2/d+6/11/c^2*(-1/9*x^4*(-c^2*d*x^2+d)^(
5/2)/c^2/d+4/9/c^2*(-1/7*x^2*(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*
x^2+d)^(5/2))))+b*(-1/247808*(-d*(c^2*x^2-1))^(1/2)*(1+11*I*(-c^2*x^2+1)^(1
/2)*x*c+1024*c^12*x^12+2816*I*(-c^2*x^2+1)^(1/2)*x^9*c^9-61*c^2*x^2-2352*c^
6*x^6+620*c^4*x^4-2816*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-3328*c^10*x^10+4096*c^8
*x^8+1232*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-1024*I*(-c^2*x^2+1)^(1/2)*x^11*c^11-
220*I*(-c^2*x^2+1)^(1/2)*x^3*c^3)*(I+11*arcsin(c*x))*d/c^8/(c^2*x^2-1)-1/55
296*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8*x^8-256*I*(-c^2*x^2+1)^(1
/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-280*c^4*x^4-432*I*
(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-9*I*
(-c^2*x^2+1)^(1/2)*x*c-1)*(I+9*arcsin(c*x))*d/c^8/(c^2*x^2-1)+1/100352*(-d*
(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+
104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(
1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d/c^8/(c^2*x^2
-1)+11/51200*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1
)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)
```

```
^(1/2)*x*c-1)*(I+5*arcsin(c*x))*d/c^8/(c^2*x^2-1)+1/3072*(-d*(c^2*x^2-1))^(
1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(
1/2)*x*c+1)*(I+3*arcsin(c*x))*d/c^8/(c^2*x^2-1)-7/1024*(-d*(c^2*x^2-1))^(1/
2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d/c^8/(c^2*x^2-1)-7
/1024*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c
*x)-I)*d/c^8/(c^2*x^2-1)+1/3072*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x
^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(
c*x))*d/c^8/(c^2*x^2-1)+11/51200*(-d*(c^2*x^2-1))^(1/2)*(16*I*c^5*x^5*(-c^2
*x^2+1)^(1/2)+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c
^2*x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-I+5*arcsin(c*x))*d/c^8/(c^2*x^2-1)+1/10
0352*(-d*(c^2*x^2-1))^(1/2)*(64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+64*c^8*x^8-112
*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+1
04*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arcsin(c*x))*d/c^
8/(c^2*x^2-1)-1/55296*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*
c^9+256*c^10*x^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*
x^2+1)^(1/2)*x^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x
^4+9*I*(-c^2*x^2+1)^(1/2)*x*c+41*c^2*x^2-1)*(-I+9*arcsin(c*x))*d/c^8/(c^2*x
^2-1)-1/247808*(-d*(c^2*x^2-1))^(1/2)*(1024*I*(-c^2*x^2+1)^(1/2)*x^11*c^11+
1024*c^12*x^12-2816*I*(-c^2*x^2+1)^(1/2)*x^9*c^9-3328*c^10*x^10+2816*I*(-c^
2*x^2+1)^(1/2)*x^7*c^7+4096*c^8*x^8-1232*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-2352*
c^6*x^6+220*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+620*c^4*x^4-11*I*(-c^2*x^2+1)^(1/2
)*c*x-61*c^2*x^2+1)*(-I+11*arcsin(c*x))*d/c^8/(c^2*x^2-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 249, normalized size of antiderivative = 0.66

$$\int x^7 \left(d - c^2 d x^2\right)^{3/2} \left(a + b \arcsin(cx)\right) dx = -\frac{\left(33075\, b c^{11} d x^{11} - 53900\, b c^9 d x^9 + 2475\, b c^7 d x^7 + 4158\, b c^5 d x^5 + 9240\, b c^3 d x^3 + 55440\, b c d x\right) \sqrt{-c^2 d x^2 + d} \sqrt{-}$$

```
[In] integrate(x^7*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/4002075*((33075*b*c^11*d*x^11 - 53900*b*c^9*d*x^9 + 2475*b*c^7*d*x^7 + 4
158*b*c^5*d*x^5 + 9240*b*c^3*d*x^3 + 55440*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sq
rt(-c^2*x^2 + 1) + 3465*(105*a*c^12*d*x^12 - 245*a*c^10*d*x^10 + 145*a*c^8*
d*x^8 + a*c^6*d*x^6 + 2*a*c^4*d*x^4 + 8*a*c^2*d*x^2 - 16*a*d + (105*b*c^12*
d*x^12 - 245*b*c^10*d*x^10 + 145*b*c^8*d*x^8 + b*c^6*d*x^6 + 2*b*c^4*d*x^4
+ 8*b*c^2*d*x^2 - 16*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^10*x^2 - c^
8)
```

Sympy [F(-1)]

Timed out.

$$\int x^7 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \text{Timed out}$$

```
[In] integrate(x**7*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 267, normalized size of antiderivative = 0.71

$$\int x^7 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx =$$
$$-\frac{1}{1155}\left(\frac{105\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^6}{c^2d}+\frac{70\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^4}{c^4d}+\frac{40\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}{c^6d}+\frac{16\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{c^8d}\right)b\arcsin$$
$$-\frac{1}{1155}\left(\frac{105\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^6}{c^2d}+\frac{70\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^4}{c^4d}+\frac{40\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}{c^6d}+\frac{16\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{c^8d}\right)a$$
$$+\frac{\left(33075\,c^{10}d^{\frac{3}{2}}x^{11}-53900\,c^8d^{\frac{3}{2}}x^9+2475\,c^6d^{\frac{3}{2}}x^7+4158\,c^4d^{\frac{3}{2}}x^5+9240\,c^2d^{\frac{3}{2}}x^3+55440\,d^{\frac{3}{2}}x\right)b}{4002075\,c^7}$$

```
[In] integrate(x^7*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] -1/1155*(105*(-c^2*d*x^2 + d)^(5/2)*x^6/(c^2*d) + 70*(-c^2*d*x^2 + d)^(5/2)
*x^4/(c^4*d) + 40*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^6*d) + 16*(-c^2*d*x^2 + d)^
(5/2)/(c^8*d))*b*arcsin(c*x) - 1/1155*(105*(-c^2*d*x^2 + d)^(5/2)*x^6/(c^2*
d) + 70*(-c^2*d*x^2 + d)^(5/2)*x^4/(c^4*d) + 40*(-c^2*d*x^2 + d)^(5/2)*x^2/
(c^6*d) + 16*(-c^2*d*x^2 + d)^(5/2)/(c^8*d))*a + 1/4002075*(33075*c^10*d^(3
/2)*x^11 - 53900*c^8*d^(3/2)*x^9 + 2475*c^6*d^(3/2)*x^7 + 4158*c^4*d^(3/2)*
x^5 + 9240*c^2*d^(3/2)*x^3 + 55440*d^(3/2)*x)*b/c^7
```

Giac [F(-2)]

Exception generated.

$$\int x^7 (d - c^2dx^2)^{3/2} (a + b\arcsin(cx))\, dx = \text{Exception raised: TypeError}$$

[In] integrate(x^7*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int x^7 (d - c^2dx^2)^{3/2} (a + b\arcsin(cx))\, dx = \int x^7 \left(a + b\,\mathrm{asin}(c\,x)\right) \left(d - c^2\,d\,x^2\right)^{3/2} dx$$

[In] int(x^7*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)

[Out] int(x^7*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)

3.78 $\int x^5(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 301

$$\int x^5\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\frac{8bdx\sqrt{d-c^2dx^2}}{315c^5\sqrt{1-c^2x^2}}+\frac{4bdx^3\sqrt{d-c^2dx^2}}{945c^3\sqrt{1-c^2x^2}}+\frac{bdx^5\sqrt{d-c^2dx^2}}{525c\sqrt{1-c^2x^2}}-\frac{10bcdx^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}}+\frac{bc^3dx^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{5c^6d}+\frac{2\left(d-c^2dx^2\right)^{7/2}(a+b\arcsin(cx))}{7c^6d^2}-\frac{\left(d-c^2dx^2\right)^{9/2}(a+b\arcsin(cx))}{9c^6d^3}$$

```
[Out] -1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/c^6/d+2/7*(-c^2*d*x^2+d)^(7/2)*
(a+b*arcsin(c*x))/c^6/d^2-1/9*(-c^2*d*x^2+d)^(9/2)*(a+b*arcsin(c*x))/c^6/d^
3+8/315*b*d*x*(-c^2*d*x^2+d)^(1/2)/c^5/(-c^2*x^2+1)^(1/2)+4/945*b*d*x^3*(-c
^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/525*b*d*x^5*(-c^2*d*x^2+d)^(1/2)
/c/(-c^2*x^2+1)^(1/2)-10/441*b*c*d*x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1
/2)+1/81*b*c^3*d*x^9*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 301, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used

$= \{272, 45, 4779, 12, 1167\}$

$$\int x^5 (d-c^2dx^2)^{3/2} (a+b\arcsin(cx))\,dx = -\frac{(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{9c^6d^3} + \frac{2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^6d^2} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^6d} - \frac{10bcdx^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}} + \frac{bdx^5\sqrt{d-c^2dx^2}}{525c\sqrt{1-c^2x^2}} + \frac{8bdx\sqrt{d-c^2dx^2}}{315c^5\sqrt{1-c^2x^2}} + \frac{bc^3dx^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}} + \frac{4bdx^3\sqrt{d-c^2dx^2}}{945c^3\sqrt{1-c^2x^2}}$$

```
[In] Int[x^5*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*d*x*Sqrt[d - c^2*d*x^2])/(315*c^5*Sqrt[1 - c^2*x^2]) + (4*b*d*x^3*Sqrt
[d - c^2*d*x^2])/(945*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^5*Sqrt[d - c^2*d*x^2]
)/(525*c*Sqrt[1 - c^2*x^2]) - (10*b*c*d*x^7*Sqrt[d - c^2*d*x^2])/(441*Sqrt[
1 - c^2*x^2]) + (b*c^3*d*x^9*Sqrt[d - c^2*d*x^2])/(81*Sqrt[1 - c^2*x^2]) -
((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^6*d) + (2*(d - c^2*d*x^2)^
(7/2)*(a + b*ArcSin[c*x]))/(7*c^6*d^2) - ((d - c^2*d*x^2)^(9/2)*(a + b*ArcS
in[c*x]))/(9*c^6*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^6d}+\frac{2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^6d^2} \\
&\quad -\frac{(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{9c^6d^3} \\
&\quad -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{d(1-c^2x^2)^2(-8-20c^2x^2-35c^4x^4)}{315c^6}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^6d}+\frac{2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^6d^2} \\
&\quad -\frac{(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{9c^6d^3} \\
&\quad -\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)^2(-8-20c^2x^2-35c^4x^4)\,dx}{315c^5\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^6d}+\frac{2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^6d^2} \\
&\quad -\frac{(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{9c^6d^3} \\
&\quad -\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int(-8-4c^2x^2-3c^4x^4+50c^6x^6-35c^8x^8)\,dx}{315c^5\sqrt{1-c^2x^2}} \\
&= \frac{8bdx\sqrt{d-c^2dx^2}}{315c^5\sqrt{1-c^2x^2}}+\frac{4bdx^3\sqrt{d-c^2dx^2}}{945c^3\sqrt{1-c^2x^2}}+\frac{bdx^5\sqrt{d-c^2dx^2}}{525c\sqrt{1-c^2x^2}} \\
&\quad -\frac{10bcdx^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}}+\frac{bc^3dx^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^6d} \\
&\quad +\frac{2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^6d^2}-\frac{(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{9c^6d^3}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 150, normalized size of antiderivative = 0.50

$$\int x^5 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \frac{d\sqrt{d-c^2dx^2}\left(-315a(1-c^2x^2)^{5/2}\left(8+20c^2x^2+35c^4x^4\right)+bcx(2520+420c^2x^2+189c^4x^4\right.}{99225c^6\sqrt{1-}$$

```
[In] Integrate[x^5*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(-315*a*(1 - c^2*x^2)^(5/2)*(8 + 20*c^2*x^2 + 35*c^4
*x^4) + b*c*x*(2520 + 420*c^2*x^2 + 189*c^4*x^4 - 2250*c^6*x^6 + 1225*c^8*x
^8) - 315*b*(1 - c^2*x^2)^(5/2)*(8 + 20*c^2*x^2 + 35*c^4*x^4)*ArcSin[c*x]))
/(99225*c^6*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.28 (sec) , antiderivative size = 1254, normalized size of antiderivative = 4.17

method	result	size
default	Expression too large to display	1254
parts	Expression too large to display	1254

```
[In] int(x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/9*x^4*(-c^2*d*x^2+d)^(5/2)/c^2/d+4/9/c^2*(-1/7*x^2*(-c^2*d*x^2+d)^(5/
2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2)))+b*(-1/41472*(-d*(c^2*x^2-1))^(1/
2)*(256*c^10*x^10-704*c^8*x^8-256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+
576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-280*c^4*x^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c
^5+41*c^2*x^2+120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1
)*(I+9*arcsin(c*x))*d/c^6/(c^2*x^2-1)-1/25088*(-d*(c^2*x^2-1))^(1/2)*(64*c^
8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x
^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^
2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d/c^6/(c^2*x^2-1)+1/3200*(-d*(c^2*x^2-1
))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+
20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c
*x))*d/c^6/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)
^(1/2)*x*c-1)*(arcsin(c*x)+I)*d/c^6/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2
)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d/c^6/(c^2*x^2-1)+1/
1152*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(
-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d/c^6/(c^2*x^2-1)-1/2
5088*(-d*(c^2*x^2-1))^(1/2)*(64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+64*c^8*x^8-112
```

```
*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+1
04*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arcsin(c*x))*d/c^
6/(c^2*x^2-1)-1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*
c^9+256*c^10*x^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*
x^2+1)^(1/2)*x^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x
^4+9*I*(-c^2*x^2+1)^(1/2)*x*c+41*c^2*x^2-1)*(-I+9*arcsin(c*x))*d/c^6/(c^2*x
^2-1)-1/14400*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(
17*I+15*arcsin(c*x))*cos(4*arcsin(c*x))*d/c^6/(c^2*x^2-1)-1/3600*(-d*(c^2*x
^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(2*I+15*arcsin(c*x))*sin(
4*arcsin(c*x))*d/c^6/(c^2*x^2-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 219, normalized size of antiderivative = 0.73

$$\int x^5\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx =$$
$$-\frac{(1225\,bc^9dx^9-2250\,bc^7dx^7+189\,bc^5dx^5+420\,bc^3dx^3+2520\,bcdx)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+315\,(35\,ac$$

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/99225*((1225*b*c^9*d*x^9 - 2250*b*c^7*d*x^7 + 189*b*c^5*d*x^5 + 420*b*c^
3*d*x^3 + 2520*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 315*(35*a
*c^10*d*x^10 - 85*a*c^8*d*x^8 + 53*a*c^6*d*x^6 + a*c^4*d*x^4 + 4*a*c^2*d*x^
2 - 8*a*d + (35*b*c^10*d*x^10 - 85*b*c^8*d*x^8 + 53*b*c^6*d*x^6 + b*c^4*d*x
^4 + 4*b*c^2*d*x^2 - 8*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^8*x^2 - c
^6)
```

Sympy [F(-1)]

Timed out.

$$\int x^5\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \text{Timed out}$$

```
[In] integrate(x**5*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 208, normalized size of antiderivative = 0.69

$$\int x^5 \left(d - c^2 d x^2\right)^{3/2} \left(a + b \arcsin(cx)\right) dx =$$
$$-\frac{1}{315}\left(\frac{35\,(-c^2dx^2+d)^{\frac{5}{2}}x^4}{c^2d}+\frac{20\,(-c^2dx^2+d)^{\frac{5}{2}}x^2}{c^4d}+\frac{8\,(-c^2dx^2+d)^{\frac{5}{2}}}{c^6d}\right)b\arcsin\left(cx\right)$$
$$-\frac{1}{315}\left(\frac{35\,(-c^2dx^2+d)^{\frac{5}{2}}x^4}{c^2d}+\frac{20\,(-c^2dx^2+d)^{\frac{5}{2}}x^2}{c^4d}+\frac{8\,(-c^2dx^2+d)^{\frac{5}{2}}}{c^6d}\right)a$$
$$+\frac{\left(1225\,c^8d^{\frac{3}{2}}x^9-2250\,c^6d^{\frac{3}{2}}x^7+189\,c^4d^{\frac{3}{2}}x^5+420\,c^2d^{\frac{3}{2}}x^3+2520\,d^{\frac{3}{2}}x\right)b}{99225\,c^5}$$

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -1/315*(35*(-c^2*d*x^2 + d)^(5/2)*x^4/(c^2*d) + 20*(-c^2*d*x^2 + d)^(5/2)*x
^2/(c^4*d) + 8*(-c^2*d*x^2 + d)^(5/2)/(c^6*d))*b*arcsin(c*x) - 1/315*(35*(-
c^2*d*x^2 + d)^(5/2)*x^4/(c^2*d) + 20*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^4*d) +
8*(-c^2*d*x^2 + d)^(5/2)/(c^6*d))*a + 1/99225*(1225*c^8*d^(3/2)*x^9 - 2250*
c^6*d^(3/2)*x^7 + 189*c^4*d^(3/2)*x^5 + 420*c^2*d^(3/2)*x^3 + 2520*d^(3/2)*
x)*b/c^5
```

Giac [F(-2)]

Exception generated.

$$\int x^5 \left(d - c^2 d x^2\right)^{3/2} \left(a + b \arcsin(cx)\right) dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x^5 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx=\int x^5\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

```
[In] int(x^5*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x^5*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.79 $\int x^3(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 227

$$\int x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\frac{2bdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{bdx^3\sqrt{d-c^2dx^2}}{105c\sqrt{1-c^2x^2}}-\frac{8bcdx^5\sqrt{d-c^2dx^2}}{175\sqrt{1-c^2x^2}}+\frac{bc^3dx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{5c^4d}+\frac{\left(d-c^2dx^2\right)^{7/2}(a+b\arcsin(cx))}{7c^4d^2}$$

```
[Out] -1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/c^4/d+1/7*(-c^2*d*x^2+d)^(7/2)*
(a+b*arcsin(c*x))/c^4/d^2+2/35*b*d*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^
(1/2)+1/105*b*d*x^3*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-8/175*b*c*d*x
^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/49*b*c^3*d*x^7*(-c^2*d*x^2+d)^
(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {272, 45, 4779, 12, 380}

$$\int x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\frac{\left(d-c^2dx^2\right)^{7/2}(a+b\arcsin(cx))}{7c^4d^2}-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{5c^4d}-\frac{8bcdx^5\sqrt{d-c^2dx^2}}{175\sqrt{1-c^2x^2}}+\frac{bdx^3\sqrt{d-c^2dx^2}}{105c\sqrt{1-c^2x^2}}+\frac{2bdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{bc^3dx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}$$

```
[In] Int[x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d*x*Sqrt[d - c^2*d*x^2])/(35*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^3*Sqrt[d
- c^2*d*x^2])/(105*c*Sqrt[1 - c^2*x^2]) - (8*b*c*d*x^5*Sqrt[d - c^2*d*x^2])
/(175*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^7*Sqrt[d - c^2*d*x^2])/(49*Sqrt[1 - c
^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^4*d) + ((d - c^
2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^4*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 380

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\text{integral} = -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^4d}+\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^4d^2} - \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{d(-2-5c^2x^2)(1-c^2x^2)^2}{35c^4}\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^4d} + \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^4d^2} - \frac{\left(bd\sqrt{d-c^2dx^2}\right)\int(-2-5c^2x^2)(1-c^2x^2)^2\,dx}{35c^3\sqrt{1-c^2x^2}}$$

$$= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^4d} + \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^4d^2} - \frac{\left(bd\sqrt{d-c^2dx^2}\right)\int(-2-c^2x^2+8c^4x^4-5c^6x^6)\,dx}{35c^3\sqrt{1-c^2x^2}}$$

$$= \frac{2bdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}} + \frac{bdx^3\sqrt{d-c^2dx^2}}{105c\sqrt{1-c^2x^2}} - \frac{8bcdx^5\sqrt{d-c^2dx^2}}{175\sqrt{1-c^2x^2}} + \frac{bc^3dx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^4d} + \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^4d^2}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 126, normalized size of antiderivative = 0.56

$$\int x^3(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx = \frac{d\sqrt{d-c^2dx^2}\left(-105a(1-c^2x^2)^{5/2}(2+5c^2x^2)+bcx(210+35c^2x^2-168c^4x^4+75c^6x^6)-\right.}{3675c^4\sqrt{1-c^2x^2}}$$

```
[In] Integrate[x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(-105*a*(1 - c^2*x^2)^(5/2)*(2 + 5*c^2*x^2) + b*c*x*
(210 + 35*c^2*x^2 - 168*c^4*x^4 + 75*c^6*x^6) - 105*b*(1 - c^2*x^2)^(5/2)*(
2 + 5*c^2*x^2)*ArcSin[c*x]))/(3675*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.17 (sec) , antiderivative size = 727, normalized size of antiderivative = 3.20

method	result
default	$a\left(-\frac{x^2(-c^2dx^2+d)^{\frac{5}{2}}}{7c^2d}-\frac{2(-c^2dx^2+d)^{\frac{5}{2}}}{35dc^4}\right)+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(64c^8x^8-144c^6x^6-64ic^7x^7\sqrt{-c^2x^2+1}+104c^4x^4+112i\sqrt{-}\right.}{6272}\right.$
parts	$a\left(-\frac{x^2(-c^2dx^2+d)^{\frac{5}{2}}}{7c^2d}-\frac{2(-c^2dx^2+d)^{\frac{5}{2}}}{35dc^4}\right)+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(64c^8x^8-144c^6x^6-64ic^7x^7\sqrt{-c^2x^2+1}+104c^4x^4+112i\sqrt{-}\right.}{6272}\right.$

```
[In] int(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/7*x^2*(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2))+b*(
-1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x
^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-
c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d/
c^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*
x*c-1)*(arcsin(c*x)+I)*d/c^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-
c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d/c^4/(c^2*x^2-1)+1/384*(-d
*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2
+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d/c^4/(c^2*x^2-1)+3/39200*(-d
*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(2*I+35*arcsin(c*x
))*cos(6*arcsin(c*x))*d/c^4/(c^2*x^2-1)+1/78400*(-d*(c^2*x^2-1))^(1/2)*(I*c
^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(37*I+35*arcsin(c*x))*sin(6*arcsin(c*x))*d
/c^4/(c^2*x^2-1)-1/2400*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^
2*x^2-1)*(7*I+15*arcsin(c*x))*cos(4*arcsin(c*x))*d/c^4/(c^2*x^2-1)-1/4800*(
-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(11*I+45*arcsin(
c*x))*sin(4*arcsin(c*x))*d/c^4/(c^2*x^2-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 189, normalized size of antiderivative = 0.83

$$\int x^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx =$$
$$-\frac{(75\,bc^7dx^7-168\,bc^5dx^5+35\,bc^3dx^3+210\,bcdx)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+105\,(5\,ac^8dx^8-13\,ac^6dx^6+}{3675\,(c^6x}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/3675*((75*b*c^7*d*x^7 - 168*b*c^5*d*x^5 + 35*b*c^3*d*x^3 + 210*b*c*d*x)*
sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 105*(5*a*c^8*d*x^8 - 13*a*c^6*d*x
^6 + 9*a*c^4*d*x^4 + a*c^2*d*x^2 - 2*a*d + (5*b*c^8*d*x^8 - 13*b*c^6*d*x^6
+ 9*b*c^4*d*x^4 + b*c^2*d*x^2 - 2*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(
c^6*x^2 - c^4)
```

Sympy [F]

$$\int x^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int x^3 (-d(cx-1)\,(cx+1))^{\frac{3}{2}}\,(a+b\operatorname{asin}(cx))\,dx$$

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**3*(-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.66

$$\int x^3(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx = -\frac{1}{35}\left(\frac{5\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}{c^2d}+\frac{2\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{c^4d}\right)b\arcsin\left(cx\right) - \frac{1}{35}\left(\frac{5\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}{c^2d}+\frac{2\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{c^4d}\right)a + \frac{\left(75\,c^6d^{\frac{3}{2}}x^7-168\,c^4d^{\frac{3}{2}}x^5+35\,c^2d^{\frac{3}{2}}x^3+210\,d^{\frac{3}{2}}x\right)b}{3675\,c^3}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] -1/35*(5*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(5/2)/(c^4
*d))*b*arcsin(c*x) - 1/35*(5*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^2*d) + 2*(-c^2*d
*x^2 + d)^(5/2)/(c^4*d))*a + 1/3675*(75*c^6*d^(3/2)*x^7 - 168*c^4*d^(3/2)*x
^5 + 35*c^2*d^(3/2)*x^3 + 210*d^(3/2)*x)*b/c^3
```

Giac [F(-2)]

Exception generated.

$$\int x^3(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x^3(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx = \int x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(d-c^2\,d\,x^2\right)}^{3/2}\,dx$$

```
[In] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.80 $\int x(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 153

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\frac{bdx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}}-\frac{2bcdx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{bc^3dx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{5c^2d}$$

```
[Out] -1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/c^2/d+1/5*b*d*x*(-c^2*d*x^2+d)^
(1/2)/c/(-c^2*x^2+1)^(1/2)-2/15*b*c*d*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)
^(1/2)+1/25*b*c^3*d*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {4767, 200}

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{5c^2d}+\frac{bdx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}}-\frac{2bcdx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{bc^3dx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}$$

```
[In] Int[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d*x*Sqrt[d - c^2*d*x^2])/(5*c*Sqrt[1 - c^2*x^2]) - (2*b*c*d*x^3*Sqrt[d -
 c^2*d*x^2])/(15*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^5*Sqrt[d - c^2*d*x^2])/(25
*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^2*d)
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^2d}+\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)^2\,dx}{5c\sqrt{1-c^2x^2}}\\
&= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^2d}+\frac{\left(bd\sqrt{d-c^2dx^2}\right)\int(1-2c^2x^2+c^4x^4)\,dx}{5c\sqrt{1-c^2x^2}}\\
&= \frac{bdx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}}-\frac{2bcdx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{bc^3dx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^2d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.55

$$\int x(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx=\frac{d\sqrt{d-c^2dx^2}\left(\frac{bc\left(x-\frac{2c^2x^3}{3}+\frac{c^4x^5}{5}\right)}{\sqrt{1-c^2x^2}}-(-1+c^2x^2)^2(a+b\arcsin(cx))\right)}{5c^2}$$

```
[In] Integrate[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
[Out] (d*Sqrt[d - c^2*d*x^2]*((b*c*(x - (2*c^2*x^3)/3 + (c^4*x^5)/5))/Sqrt[1 - c^
2*x^2] - (-1 + c^2*x^2)^2*(a + b*ArcSin[c*x])))/(5*c^2)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.24 (sec) , antiderivative size = 524, normalized size of antiderivative = 3.42

method	result
default	$-\frac{a\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{5 c^{2} d}+b\left(-\frac{\sqrt{-d\left(c^{2} x^{2}-1\right)}\,\left(16 c^{6} x^{6}-28 c^{4} x^{4}-16 i \sqrt{-c^{2} x^{2}+1}\, x^{5} c^{5}+13 c^{2} x^{2}+20 i \sqrt{-c^{2} x^{2}+1}\, x^{3} c^{3}-5 i c x \sqrt{-c^{2} x^{2}+1}\right.}{800 c^{2}\left(c^{2} x^{2}-1\right)}\right.$
parts	$-\frac{a\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{5 c^{2} d}+b\left(-\frac{\sqrt{-d\left(c^{2} x^{2}-1\right)}\,\left(16 c^{6} x^{6}-28 c^{4} x^{4}-16 i \sqrt{-c^{2} x^{2}+1}\, x^{5} c^{5}+13 c^{2} x^{2}+20 i \sqrt{-c^{2} x^{2}+1}\, x^{3} c^{3}-5 i c x \sqrt{-c^{2} x^{2}+1}\right.}{800 c^{2}\left(c^{2} x^{2}-1\right)}\right.$

```
[In] int(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/5*a*(-c^2*d*x^2+d)^(5/2)/c^2/d+b*(-1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*
x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)
^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c*x))*d/c^2/(c^2*x
^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arc
sin(c*x)+I)*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(
1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d/c^2/(c^2*x^2-1)+1/96*(-d*(c^2*x^2-1))
^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c
-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/1200*(-d*(c^2*x^2-1))^
(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(11*I+45*arcsin(c*x))*cos(4*arcs
in(c*x))*d/c^2/(c^2*x^2-1)-1/600*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^
2*x^2+1)^(1/2)-I)*(7*I+15*arcsin(c*x))*sin(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)
)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 159, normalized size of antiderivative = 1.04

$$\int x\left(d-c^{2} d x^{2}\right)^{3/2}(a+b\arcsin(cx))\,dx =$$
$$-\frac{\left(3\,bc^{5}dx^{5}-10\,bc^{3}dx^{3}+15\,bcdx\right)\sqrt{-c^{2}dx^{2}+d}\sqrt{-c^{2}x^{2}+1}+15\left(ac^{6}dx^{6}-3\,ac^{4}dx^{4}+3\,ac^{2}dx^{2}-ad+(bc\right.}{75\left(c^{4}x^{2}-c^{2}\right)}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] -1/75*((3*b*c^5*d*x^5 - 10*b*c^3*d*x^3 + 15*b*c*d*x)*sqrt(-c^2*d*x^2 + d)*s
qrt(-c^2*x^2 + 1) + 15*(a*c^6*d*x^6 - 3*a*c^4*d*x^4 + 3*a*c^2*d*x^2 - a*d +
 (b*c^6*d*x^6 - 3*b*c^4*d*x^4 + 3*b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2
*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F]

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\int x(-d(cx-1)\,(cx+1))^{\frac{3}{2}}\,(a+b\operatorname{asin}(cx))\,dx$$

```
[In] integrate(x*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
[Out] Integral(x*(-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.57

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=-\frac{(-c^2dx^2+d)^{\frac{5}{2}}b\arcsin(cx)}{5\,c^2d}-\frac{(-c^2dx^2+d)^{\frac{5}{2}}a}{5\,c^2d}+\frac{\left(3\,c^4d^{\frac{5}{2}}x^5-10\,c^2d^{\frac{5}{2}}x^3+15\,d^{\frac{5}{2}}x\right)b}{75\,cd}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] -1/5*(-c^2*d*x^2 + d)^(5/2)*b*arcsin(c*x)/(c^2*d) - 1/5*(-c^2*d*x^2 + d)^(5
/2)*a/(c^2*d) + 1/75*(3*c^4*d^(5/2)*x^5 - 10*c^2*d^(5/2)*x^3 + 15*d^(5/2)*x
)*b/(c*d)
```

Giac [F(-2)]

Exception generated.

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx=\int x\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

```
[In] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.81 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 278

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x}\,dx = -\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{3}(d - c^2dx^2)^{3/2}(a+b\arcsin(cx)) - \frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{ibd\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{ibd\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

```
[Out] 1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+d*(a+b*arcsin(c*x))*(-c^2*d*x^2+
d)^(1/2)-4/3*b*c*d*x*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/9*b*c^3*d*x^
3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*d*(a+b*arcsin(c*x))*arctanh(I*c
*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+I*b*d*polylo
g(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b*
d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/
2)
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4787, 4783, 4803, 4268, 2317, 2438, 8}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x}\,dx = -\frac{2d\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} + \frac{1}{3}\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + d\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{ibd\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{ibd\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (-4*b*c*d*x*Sqrt[d - c^2*d*x^2])/(3*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^3*Sqrt[
d - c^2*d*x^2])/(9*Sqrt[1 - c^2*x^2]) + d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x]) + ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/3 - (2*d*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] +
(I*b*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2
] - (I*b*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*
x^2]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
```

```
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\text{integral} = \frac{1}{3}\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+d\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}\,dx-\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)\,dx}{3\sqrt{1-c^2x^2}}$$

$$=-\frac{bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}+\frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}+d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{1}{3}\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{\left(d\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}-\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int 1\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{3}\left(d - c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\csc(x)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{3}\left(d - c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(bd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{\left(bd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{3}\left(d - c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{\left(ibd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(ibd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{4bcdx\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} + \frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{3}\left(d - c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{ibd\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{ibd\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.84 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.00

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x}\,dx = -\frac{1}{3}ad(-4+c^2x^2)\sqrt{d-c^2dx^2}+ad^{3/2}\log(x)$$
$$-ad^{3/2}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)+\frac{bd\sqrt{d-c^2dx^2}\left(-cx+\sqrt{1-c^2x^2}\arcsin(cx)+\arcsin(cx)\log\left(1-e^{i\arcsin(cx)}\right.\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] -1/3*(a*d*(-4 + c^2*x^2)*Sqrt[d - c^2*d*x^2]) + a*d^(3/2)*Log[x] - a*d^(3/2
)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*d*Sqrt[d - c^2*d*x^2]*(-(c*x) +
 Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - A
rcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + I*PolyLog[2, -E^(I*ArcSin[c*x])] -
I*PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (b*d*Sqrt[d - c^2*d*x
^2]*(9*c*x - 3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^2] + Cos[3*ArcSin[c*x]]) + Sin
[3*ArcSin[c*x]]))/(36*Sqrt[1 - c^2*x^2])
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 525, normalized size of antiderivative = 1.89

method	result
default	$\frac{(-c^2dx^2+d)^{\frac{3}{2}}a}{3}-a\,d^{\frac{3}{2}}\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2dx^2+d}}{x}\right)+ad\sqrt{-c^2dx^2+d}-\frac{4b\sqrt{-d(c^2x^2-1)}\,d\arcsin(cx)}{3(c^2x^2-1)}-\frac{ib\sqrt{-d(c^2x}{}$
parts	$\frac{(-c^2dx^2+d)^{\frac{3}{2}}a}{3}-a\,d^{\frac{3}{2}}\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2dx^2+d}}{x}\right)+ad\sqrt{-c^2dx^2+d}-\frac{4b\sqrt{-d(c^2x^2-1)}\,d\arcsin(cx)}{3(c^2x^2-1)}-\frac{ib\sqrt{-d(c^2x}{}$

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*(-c^2*d*x^2+d)^(3/2)*a-a*d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2)
)/x)+a*d*(-c^2*d*x^2+d)^(1/2)-4/3*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*ar
csin(c*x)-I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*polyl
og(2,-I*c*x-(-c^2*x^2+1)^(1/2))+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/
2)/(c^2*x^2-1)*d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/3*b*(-d*(c^2*x^2-1))
^(1/2)*d/(c^2*x^2-1)*arcsin(c*x)*x^4*c^4+5/3*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^
2*x^2-1)*arcsin(c*x)*x^2*c^2-1/9*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*(-c
^2*x^2+1)^(1/2)*x^3*c^3+4/3*b*(-d*(c^2*x^2-1))^(1/2)*d/(c^2*x^2-1)*(-c^2*x^
2+1)^(1/2)*x*c+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d*ar
csin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2
+1)^(1/2)/(c^2*x^2-1)*d*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x}\,dx = \int \frac{(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\,\mathrm{asin}(cx))}{x}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x,x)
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
[Out] -b*sqrt(d)*integrate((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x) - 1/3*(3*d^(3/2)*log(2*sqrt(-c^2*d*
x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - (-c^2*d*x^2 + d)^(3/2) - 3*sqrt(-c^
2*d*x^2 + d)*d)*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x, x)
```

3.82 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^3}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 297

$$\begin{aligned}\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^3}\,dx &= -\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}+\frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}\\ &-\frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{2x^2}\\ &+\frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}\\ &-\frac{3ibc^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}}\\ &+\frac{3ibc^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] -1/2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2-3/2*c^2*d*(a+b*arcsin(c*x))
*(-c^2*d*x^2+d)^(1/2)-1/2*b*c*d*(-c^2*d*x^2+d)^(1/2)/x/(-c^2*x^2+1)^(1/2)+b
*c^3*d*x*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3*c^2*d*(a+b*arcsin(c*x))*
arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-3
/2*I*b*c^2*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^
2*x^2+1)^(1/2)+3/2*I*b*c^2*d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^
2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 297, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4785, 4783, 4803, 4268, 2317, 2438, 8, 14}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^3}\,dx=\frac{3c^2d\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}-\frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{2x^2}-\frac{3ibc^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}}+\frac{3ibc^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}}-\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}}+\frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(b*c*d*Sqrt[d - c^2*d*x^2])/(x*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x*Sqrt[d
- c^2*d*x^2])/Sqrt[1 - c^2*x^2] - (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSi
n[c*x]))/2 - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(2*x^2) + (3*c^2*d
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1
 - c^2*x^2] - (((3*I)/2)*b*c^2*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSi
n[c*x])])/Sqrt[1 - c^2*x^2] + (((3*I)/2)*b*c^2*d*Sqrt[d - c^2*d*x^2]*PolyLo
g[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{2x^2}\\ &\quad -\frac{1}{2}\left(3c^2d\right)\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}\,dx+\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\frac{1-c^2x^2}{x^2}\,dx}{2\sqrt{1-c^2x^2}}\end{aligned}$$

$$= -\frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{2x^2} + \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\left(-c^2+\frac{1}{x^2}\right)dx}{2\sqrt{1-c^2x^2}} - \frac{\left(3c^2d\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}dx}{2\sqrt{1-c^2x^2}} + \frac{\left(3bc^3d\sqrt{d-c^2dx^2}\right)\int 1\,dx}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{2x^2} - \frac{\left(3c^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\csc(x)\,dx, x, \arcsin(cx)\right)}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{2x^2} + \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{\left(3bc^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-e^{ix}\right)dx, x, \arcsin(cx)\right)}{2\sqrt{1-c^2x^2}} - \frac{\left(3bc^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1+e^{ix}\right)dx, x, \arcsin(cx)\right)}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{2x^2} + \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(3ibc^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}} + \frac{\left(3ibc^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{bc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a + b\arcsin(cx)) - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{2x^2} + \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{3ibc^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}} + \frac{3ibc^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 1.58 (sec) , antiderivative size = 389, normalized size of antiderivative = 1.31

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^3}\,dx = -\frac{ad(1+2c^2x^2)\sqrt{d-c^2dx^2}}{2x^2} - \frac{3}{2}ac^2d^{3/2}\log(x) + \frac{3}{2}ac^2d^{3/2}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right) + \frac{bc^2d\sqrt{d-c^2dx^2}\left(cx-\sqrt{1-c^2x^2}\arcsin(cx)-\arcsin(cx)\log\left(1-e^{i\operatorname{arc}}\right.\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(a*d*(1 + 2*c^2*x^2)*Sqrt[d - c^2*d*x^2])/x^2 - (3*a*c^2*d^(3/2)*Log[x
])/2 + (3*a*c^2*d^(3/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/2 + (b*c^2*d*
Sqrt[d - c^2*d*x^2]*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c*x] - ArcSin[c*x]*Log[
1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - I*PolyLog
[2, -E^(I*ArcSin[c*x])] + I*PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^
2] + (b*c^2*d^2*Sqrt[1 - c^2*x^2]*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[
ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]
*Log[1 + E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (4*I)*
PolyLog[2, E^(I*ArcSin[c*x])] + ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[Ar
cSin[c*x]/2]))/(8*Sqrt[d - c^2*d*x^2])
```

Maple [A] (verified)

Time = 0.17 (sec) , antiderivative size = 437, normalized size of antiderivative = 1.47

method	result
default	$a\left(-\frac{\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{2 d\,x^{2}}-\frac{3 c^{2}\left(\frac{\left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}{3}+d\left(\sqrt{-c^{2} d\,x^{2}+d}-\sqrt{d}\,\ln\left(\frac{2 d+2 \sqrt{d}\,\sqrt{-c^{2} d\,x^{2}+d}}{x}\right)\right)\right)}{2}\right)+b\left(-\frac{\sqrt{-d\left(c^{2} x^{2}-1\right)}\,\left(c^{2}\right.}{}\right.$
parts	$a\left(-\frac{\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{2 d\,x^{2}}-\frac{3 c^{2}\left(\frac{\left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}{3}+d\left(\sqrt{-c^{2} d\,x^{2}+d}-\sqrt{d}\,\ln\left(\frac{2 d+2 \sqrt{d}\,\sqrt{-c^{2} d\,x^{2}+d}}{x}\right)\right)\right)}{2}\right)+b\left(-\frac{\sqrt{-d\left(c^{2} x^{2}-1\right)}\,\left(c^{2}\right.}{}\right.$

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/2/d/x^2*(-c^2*d*x^2+d)^(5/2)-3/2*c^2*(1/3*(-c^2*d*x^2+d)^(3/2)+d*((-c
^2*d*x^2+d)^(1/2)-d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x))))+b*(
-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*
x)+I)*c^2*d/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*
c+c^2*x^2-1)*(arcsin(c*x)-I)*c^2*d/(c^2*x^2-1)-1/2*d*(c^2*x^2*arcsin(c*x)-c
*x*(-c^2*x^2+1)^(1/2)-arcsin(c*x))*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)+3
*I*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^
2*x^2+1)^(1/2))-I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*
x+(-c^2*x^2+1)^(1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)))*c^2*d/(2*c^2*x^
2-2))
```

Fricas [F]

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\arcsin(cx)\right)}{x^3}\,dx=\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x^3, x)
```

Sympy [F]

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}\left(a+b\arcsin(cx)\right)}{x^3}\,dx=\int \frac{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)}{x^3}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**3,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**3, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] -b*sqrt(d)*integrate((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^3, x) + 1/2*(3*c^2*d^(3/2)*log(2*sqrt(-
c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - (-c^2*d*x^2 + d)^(3/2)*c^2 -
3*sqrt(-c^2*d*x^2 + d)*c^2*d - (-c^2*d*x^2 + d)^(5/2)/(d*x^2))*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^3}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}}{x^3}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^3, x)
```

3.83 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^5}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 307

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^5}\,dx = -\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}}+\frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} + \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8x^2}-\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{4x^4} - \frac{3c^4d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{4\sqrt{1-c^2x^2}} + \frac{3ibc^4d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}} - \frac{3ibc^4d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}}$$

```
[Out] -1/4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^4+3/8*c^2*d*(a+b*arcsin(c*x))
*(-c^2*d*x^2+d)^(1/2)/x^2-1/12*b*c*d*(-c^2*d*x^2+d)^(1/2)/x^3/(-c^2*x^2+1)^
(1/2)+5/8*b*c^3*d*(-c^2*d*x^2+d)^(1/2)/x/(-c^2*x^2+1)^(1/2)-3/4*c^4*d*(a+b*
arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x
^2+1)^(1/2)+3/8*I*b*c^4*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+
d)^(1/2)/(-c^2*x^2+1)^(1/2)-3/8*I*b*c^4*d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2
))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 307, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4785, 4781, 30, 4803, 4268, 2317, 2438, 14}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^5}\,dx = -\frac{3c^4d\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4\sqrt{1-c^2x^2}} + \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8x^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{4x^4} + \frac{3ibc^4d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}} - \frac{3ibc^4d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] -1/12*(b*c*d*Sqrt[d - c^2*d*x^2])/(x^3*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d*Sqrt
[d - c^2*d*x^2])/(8*x*Sqrt[1 - c^2*x^2]) + (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a
+ b*ArcSin[c*x]))/(8*x^2) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(4*
x^4) - (3*c^4*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin
[c*x])])/(4*Sqrt[1 - c^2*x^2]) + (((3*I)/8)*b*c^4*d*Sqrt[d - c^2*d*x^2]*Pol
yLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (((3*I)/8)*b*c^4*d*Sqrt[d
- c^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{4x^4} \\ &\quad -\frac{1}{4}(3c^2d)\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^3}\,dx+\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\frac{1-c^2x^2}{x^4}\,dx}{4\sqrt{1-c^2x^2}}\end{aligned}$$

$$= \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8x^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{4x^4} + \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\left(\frac{1}{x^4}-\frac{c^2}{x^2}\right)dx}{4\sqrt{1-c^2x^2}} - \frac{\left(3bc^3d\sqrt{d-c^2dx^2}\right)\int\frac{1}{x^2}dx}{8\sqrt{1-c^2x^2}} + \frac{\left(3c^4d\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}dx}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} + \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8x^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{4x^4} + \frac{\left(3c^4d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\csc(x)\,dx,x,\arcsin(cx)\right)}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} + \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8x^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{4x^4} - \frac{3c^4d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{4\sqrt{1-c^2x^2}} - \frac{\left(3bc^4d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-e^{ix}\right)dx,x,\arcsin(cx)\right)}{8\sqrt{1-c^2x^2}} + \frac{\left(3bc^4d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1+e^{ix}\right)dx,x,\arcsin(cx)\right)}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} + \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8x^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{4x^4} - \frac{3c^4d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{4\sqrt{1-c^2x^2}} + \frac{\left(3ibc^4d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}dx,x,e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}} - \frac{\left(3ibc^4d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}dx,x,e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{5bc^3d\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} + \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8x^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{4x^4} - \frac{3c^4d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{4\sqrt{1-c^2x^2}} + \frac{3ibc^4d\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}} - \frac{3ibc^4d\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 4.57 (sec) , antiderivative size = 494, normalized size of antiderivative = 1.61

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^5}\,dx = \frac{ad(-2+5c^2x^2)\sqrt{d-c^2dx^2}}{8x^4} + \frac{3}{8}ac^4d^{3/2}\log(x) - \frac{3}{8}ac^4d^{3/2}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right) - \frac{bc^4d^2\sqrt{1-c^2x^2}\left(-2\cot\left(\frac{1}{2}\arcsin(cx)\right)-\arcsin(cx)\csc^2\left(\frac{1}{2}\arcsin(cx)\right)\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] (a*d*(-2 + 5*c^2*x^2)*Sqrt[d - c^2*d*x^2])/(8*x^4) + (3*a*c^4*d^(3/2)*Log[x
])/8 - (3*a*c^4*d^(3/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/8 - (b*c^4*d^
2*Sqrt[1 - c^2*x^2]*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]
^2 - 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Log[1 + E^(I*
ArcSin[c*x])] - (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2, E^(
I*ArcSin[c*x])] + ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))
/(8*Sqrt[d - c^2*d*x^2]) + (b*c^4*d*Sqrt[d - c^2*d*x^2]*(8*Cot[ArcSin[c*x]/
2] + 6*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - c*x*Csc[ArcSin[c*x]/2]^4 - 3*ArcS
in[c*x]*Csc[ArcSin[c*x]/2]^4 - 24*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] +
24*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (24*I)*PolyLog[2, -E^(I*ArcSin[
c*x])] + (24*I)*PolyLog[2, E^(I*ArcSin[c*x])] - 6*ArcSin[c*x]*Sec[ArcSin[c*
x]/2]^2 + 3*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^4 - (16*Sin[ArcSin[c*x]/2]^4)/(c
^3*x^3) + 8*Tan[ArcSin[c*x]/2]))/(192*Sqrt[1 - c^2*x^2])
```

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 371, normalized size of antiderivative = 1.21

method	result
default	$-\frac{a(-c^2dx^2+d)^{\frac{5}{2}}}{4dx^4} + \frac{ac^2(-c^2dx^2+d)^{\frac{5}{2}}}{8dx^2} + \frac{ac^4(-c^2dx^2+d)^{\frac{3}{2}}}{8} - \frac{3ac^4d^{\frac{3}{2}}\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)}{8} + \frac{3ac^4d\sqrt{-c^2dx^2+d}}{8} + b$
parts	$-\frac{a(-c^2dx^2+d)^{\frac{5}{2}}}{4dx^4} + \frac{ac^2(-c^2dx^2+d)^{\frac{5}{2}}}{8dx^2} + \frac{ac^4(-c^2dx^2+d)^{\frac{3}{2}}}{8} - \frac{3ac^4d^{\frac{3}{2}}\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)}{8} + \frac{3ac^4d\sqrt{-c^2dx^2+d}}{8} + b$

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a/d/x^4*(-c^2*d*x^2+d)^(5/2)+1/8*a*c^2/d/x^2*(-c^2*d*x^2+d)^(5/2)+1/8*
a*c^4*(-c^2*d*x^2+d)^(3/2)-3/8*a*c^4*d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+
d)^(1/2))/x)+3/8*a*c^4*d*(-c^2*d*x^2+d)^(1/2)+b*(1/24*d*(15*c^4*x^4*arcsin(
c*x)-15*c^3*x^3*(-c^2*x^2+1)^(1/2)-21*c^2*x^2*arcsin(c*x)+2*c*x*(-c^2*x^2+1
)^(1/2)+6*arcsin(c*x))*(-d*(c^2*x^2-1))^(1/2)/x^4/(c^2*x^2-1)-3*I*(-d*(c^2*
x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/
2))-I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2*x^2+
1)^(1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)))*c^4*d/(8*c^2*x^2-8))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^5}\,dx = \int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)}{x^5}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)/x^5, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^5}\,dx = \int \frac{\left(-d(cx-1)\,(cx+1)\right)^{\frac{3}{2}}\,(a+b\operatorname{asin}\left(cx\right))}{x^5}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/x**5,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/x**5, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))}{x^5}\,dx = \int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)}{x^5}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] -b*sqrt(d)*integrate((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^5, x) - 1/8*(3*c^4*d^(3/2)*log(2*sqrt(-
c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - (-c^2*d*x^2 + d)^(3/2)*c^4 -
3*sqrt(-c^2*d*x^2 + d)*c^4*d - (-c^2*d*x^2 + d)^(5/2)*c^2/(d*x^2) + 2*(-c^2
*d*x^2 + d)^(5/2)/(d*x^4))*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d - c^2 dx^2)^{3/2} (a + b \arcsin(cx))}{x^5} dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d - c^2 dx^2)^{3/2} (a + b \arcsin(cx))}{x^5} dx = \int \frac{(a + b \operatorname{asin}(c x)) (d - c^2 d x^2)^{3/2}}{x^5} dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^5,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/x^5, x)
```

3.84 $\int x^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 430

$$\begin{aligned}\int x^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx &= \frac{3bd^2x^2\sqrt{d-c^2dx^2}}{512c^3\sqrt{1-c^2x^2}}+\frac{bd^2x^4\sqrt{d-c^2dx^2}}{512c\sqrt{1-c^2x^2}}\\&-\frac{31bcd^2x^6\sqrt{d-c^2dx^2}}{960\sqrt{1-c^2x^2}}+\frac{21bc^3d^2x^8\sqrt{d-c^2dx^2}}{640\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^{10}\sqrt{d-c^2dx^2}}{100\sqrt{1-c^2x^2}}\\&-\frac{3d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{256c^4}-\frac{d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2}\\&+\frac{1}{32}d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{1}{16}dx^5(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\\&+\frac{1}{10}x^5(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))+\frac{3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{512bc^5\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] 1/16*d*x^5*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+1/10*x^5*(-c^2*d*x^2+d)^(
5/2)*(a+b*arcsin(c*x))-3/256*d^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c
^4-1/128*d^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+1/32*d^2*x^5*(a
+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+3/512*b*d^2*x^2*(-c^2*d*x^2+d)^(1/2)/c
^3/(-c^2*x^2+1)^(1/2)+1/512*b*d^2*x^4*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(
1/2)-31/960*b*c*d^2*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+21/640*b*c^
3*d^2*x^8*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/100*b*c^5*d^2*x^10*(-c^
2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/512*d^2*(a+b*arcsin(c*x))^2*(-c^2*d*x
^2+d)^(1/2)/b/c^5/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 430, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4787, 4783, 4795, 4737, 30, 14, 272, 45}

$$\int x^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx = \frac{1}{32}d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2} + \frac{1}{10}x^5(d-c^2dx^2)^{5/2}(a+b\arcsin(cx)) + \frac{1}{16}dx^5(d-c^2dx^2)^{3/2}(a+b\arcsin(cx)) + \frac{3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{512bc^5\sqrt{1-c^2x^2}} - \frac{3d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{256c^4}$$

```
[In] Int[x^4*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3*b*d^2*x^2*Sqrt[d - c^2*d*x^2])/(512*c^3*Sqrt[1 - c^2*x^2]) + (b*d^2*x^4*
Sqrt[d - c^2*d*x^2])/(512*c*Sqrt[1 - c^2*x^2]) - (31*b*c*d^2*x^6*Sqrt[d - c
^2*d*x^2])/(960*Sqrt[1 - c^2*x^2]) + (21*b*c^3*d^2*x^8*Sqrt[d - c^2*d*x^2])
/(640*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^10*Sqrt[d - c^2*d*x^2])/(100*Sqrt[1
 - c^2*x^2]) - (3*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(256*c^4)
- (d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(128*c^2) + (d^2*x^5*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/32 + (d*x^5*(d - c^2*d*x^2)^(3/2)*(a
 + b*ArcSin[c*x]))/16 + (x^5*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/10
+ (3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(512*b*c^5*Sqrt[1 - c^2
*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{10}x^5\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))+\frac{1}{2}d\int x^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int x^5\left(1-c^2x^2\right)^2\,dx}{10\sqrt{1-c^2x^2}}$$

$$= \frac{1}{16}dx^5\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{10}x^5\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx)) + \frac{1}{16}\left(3d^2\right)\int x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^2\left(1-c^2x\right)^2\,dx,x,x^2\right)}{20\sqrt{1-c^2x^2}} - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int x^5\left(1-c^2x^2\right)\,dx}{16\sqrt{1-c^2x^2}}$$

$$= \frac{1}{32}d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{16}dx^5\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{10}x^5\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx)) + \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{32\sqrt{1-c^2x^2}} - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int x^5\,dx}{32\sqrt{1-c^2x^2}} - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(x^2-2c^2x^3+c^4x^4\right)dx,x,x^2\right)}{20\sqrt{1-c^2x^2}} - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\left(x^5-c^2x^7\right)dx}{16\sqrt{1-c^2x^2}}$$

$$= -\frac{31bcd^2x^6\sqrt{d-c^2dx^2}}{960\sqrt{1-c^2x^2}}+\frac{21bc^3d^2x^8\sqrt{d-c^2dx^2}}{640\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^{10}\sqrt{d-c^2dx^2}}{100\sqrt{1-c^2x^2}} - \frac{d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2}+\frac{1}{32}d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{16}dx^5\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{10}x^5\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx)) + \frac{\left(3d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{128c^2\sqrt{1-c^2x^2}}+\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int x^3\,dx}{128c\sqrt{1-c^2x^2}}$$

$$= \frac{bd^2x^4\sqrt{d-c^2dx^2}}{512c\sqrt{1-c^2x^2}}-\frac{31bcd^2x^6\sqrt{d-c^2dx^2}}{960\sqrt{1-c^2x^2}}+\frac{21bc^3d^2x^8\sqrt{d-c^2dx^2}}{640\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^{10}\sqrt{d-c^2dx^2}}{100\sqrt{1-c^2x^2}}-\frac{3d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{256c^4} - \frac{d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2}+\frac{1}{32}d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{16}dx^5\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{10}x^5\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx)) + \frac{\left(3d^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{256c^4\sqrt{1-c^2x^2}}+\frac{\left(3bd^2\sqrt{d-c^2dx^2}\right)\int x\,dx}{256c^3\sqrt{1-c^2x^2}}$$

$$= \frac{3bd^2x^2\sqrt{d-c^2dx^2}}{512c^3\sqrt{1-c^2x^2}} + \frac{bd^2x^4\sqrt{d-c^2dx^2}}{512c\sqrt{1-c^2x^2}} - \frac{31bcd^2x^6\sqrt{d-c^2dx^2}}{960\sqrt{1-c^2x^2}} + \frac{21bc^3d^2x^8\sqrt{d-c^2dx^2}}{640\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^{10}\sqrt{d-c^2dx^2}}{100\sqrt{1-c^2x^2}} - \frac{3d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{256c^4} - \frac{d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2} + \frac{1}{32}d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{16}dx^5(d-c^2dx^2)^{3/2}(a+b\arcsin(cx)) + \frac{1}{10}x^5(d-c^2dx^2)^{5/2}(a+b\arcsin(cx)) + \frac{3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{512bc^5\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 220, normalized size of antiderivative = 0.51

$$\int x^4(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx = \frac{d^2\sqrt{d-c^2dx^2}\left(225a^2+b^2c^2x^2(225+75c^2x^2-1240c^4x^4+1260c^6x^6-384c^8x^8)+30abc\right.}{}$$

```
[In] Integrate[x^4*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(225*a^2 + b^2*c^2*x^2*(225 + 75*c^2*x^2 - 1240*c^
4*x^4 + 1260*c^6*x^6 - 384*c^8*x^8) + 30*a*b*c*x*Sqrt[1 - c^2*x^2]*(-15 - 1
0*c^2*x^2 + 248*c^4*x^4 - 336*c^6*x^6 + 128*c^8*x^8) + 30*b*(15*a + b*c*x*S
qrt[1 - c^2*x^2]*(-15 - 10*c^2*x^2 + 248*c^4*x^4 - 336*c^6*x^6 + 128*c^8*x^
8))*ArcSin[c*x] + 225*b^2*ArcSin[c*x]^2))/(38400*b*c^5*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.20 (sec) , antiderivative size = 1106, normalized size of antiderivative = 2.57

method	result	size
default	Expression too large to display	1106
parts	Expression too large to display	1106

```
[In] int(x^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/10*a*x^3*(-c^2*d*x^2+d)^(7/2)/c^2/d-3/80*a/c^4*x*(-c^2*d*x^2+d)^(7/2)/d+
1/160*a/c^4*x*(-c^2*d*x^2+d)^(5/2)+1/128*a/c^4*d*x*(-c^2*d*x^2+d)^(3/2)+3/2
56*a/c^4*d^2*x*(-c^2*d*x^2+d)^(1/2)+3/256*a/c^4*d^3/(c^2*d)^(1/2)*arctan((c
^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-3/512*(-d*(c^2*x^2-1))^(1/2)*(-c^2*
```

```
x^2+1)^(1/2)/c^5/(c^2*x^2-1)*arcsin(c*x)^2*d^2+1/102400*(-d*(c^2*x^2-1))^(1
/2)*(-512*I*(-c^2*x^2+1)^(1/2)*x^10*c^10+512*c^11*x^11+1280*I*(-c^2*x^2+1)^
(1/2)*x^8*c^8-1536*c^9*x^9-1120*I*(-c^2*x^2+1)^(1/2)*x^6*c^6+1696*c^7*x^7+4
00*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-832*c^5*x^5-50*I*(-c^2*x^2+1)^(1/2)*x^2*c^2
+170*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-10*c*x)*(I+10*arcsin(c*x))*d^2/c^5/(c^2*x
^2-1)+1/2048*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x
^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*d^2/c^5/(c^2*x^2-1)-3/819
200*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(11*I+40*ar
csin(c*x))*cos(9*arcsin(c*x))*d^2/c^5/(c^2*x^2-1)+1/819200*(-d*(c^2*x^2-1))
^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(17*I+280*arcsin(c*x))*sin(9*ar
csin(c*x))*d^2/c^5/(c^2*x^2-1)+1/98304*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*
x*(-c^2*x^2+1)^(1/2)-I)*(5*I+72*arcsin(c*x))*cos(7*arcsin(c*x))*d^2/c^5/(c^
2*x^2-1)-1/98304*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1
)*(11*I+24*arcsin(c*x))*sin(7*arcsin(c*x))*d^2/c^5/(c^2*x^2-1)+1/12288*(-d*
(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(7*I+18*arcsin(c*x)
)*cos(5*arcsin(c*x))*d^2/c^5/(c^2*x^2-1)-5/12288*(-d*(c^2*x^2-1))^(1/2)*(I*
(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(I+6*arcsin(c*x))*sin(5*arcsin(c*x))*d^2/
c^5/(c^2*x^2-1)-3/1024*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(
1/2)-I)*arcsin(c*x)*cos(3*arcsin(c*x))*d^2/c^5/(c^2*x^2-1)-1/1024*(-d*(c^2*
x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*sin(3*ar
csin(c*x))*d^2/c^5/(c^2*x^2-1))
```

Fricas [F]

$$\int x^4 \left(d - c^2 d x^2\right)^{5/2} (a + b \arcsin(cx)) \, dx = \int \left(-c^2 d x^2 + d\right)^{\frac{5}{2}} (b \arcsin(cx) + a) x^4 \, dx$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((a*c^4*d^2*x^8 - 2*a*c^2*d^2*x^6 + a*d^2*x^4 + (b*c^4*d^2*x^8 - 2*
b*c^2*d^2*x^6 + b*d^2*x^4)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int x^4 \left(d - c^2 d x^2\right)^{5/2} (a + b \arcsin(cx)) \, dx = \text{Timed out}$$

```
[In] integrate(x**4*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
[Out] Timed out
```

Maxima [F]

$$\int x^4 (d - c^2 dx^2)^{5/2} (a + b \arcsin(cx)) \, dx = \int (-c^2 dx^2 + d)^{\frac{5}{2}} (b \arcsin(cx) + a) x^4 \, dx$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate((c^4*d^2*x^8 - 2*c^2*d^2*x^6 + d^2*x^4)*sqrt(c*x + 1)*s
qrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) - 1/1280*(128*
(-c^2*d*x^2 + d)^(7/2)*x^3/(c^2*d) - 8*(-c^2*d*x^2 + d)^(5/2)*x/c^4 + 48*(-
c^2*d*x^2 + d)^(7/2)*x/(c^4*d) - 10*(-c^2*d*x^2 + d)^(3/2)*d*x/c^4 - 15*sqr
t(-c^2*d*x^2 + d)*d^2*x/c^4 - 15*d^(5/2)*arcsin(c*x)/c^5)*a
```

Giac [F]

$$\int x^4 (d - c^2 dx^2)^{5/2} (a + b \arcsin(cx)) \, dx = \int (-c^2 dx^2 + d)^{\frac{5}{2}} (b \arcsin(cx) + a) x^4 \, dx$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)*x^4, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^4 (d - c^2 dx^2)^{5/2} (a + b \arcsin(cx)) \, dx = \int x^4 (a + b \operatorname{asin}(c x)) \left(d - c^2 d x^2\right)^{5/2} dx$$

```
[In] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(x^4*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.85 $\int x^2(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 351

$$\int x^2\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\frac{5bd^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}-\frac{59bcd^2x^4\sqrt{d-c^2dx^2}}{768\sqrt{1-c^2x^2}}+\frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}}{288\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}-\frac{5d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2}+\frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))+\frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{256bc^3\sqrt{1-c^2x^2}}$$

```
[Out] 5/48*d*x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+1/8*x^3*(-c^2*d*x^2+d)^(5
/2)*(a+b*arcsin(c*x))-5/128*d^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^
2+5/64*d^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+5/256*b*d^2*x^2*(-c^2
*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-59/768*b*c*d^2*x^4*(-c^2*d*x^2+d)^(1/2
)/(-c^2*x^2+1)^(1/2)+17/288*b*c^3*d^2*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)
^(1/2)-1/64*b*c^5*d^2*x^8*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/256*d^2
*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 351, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used

$= \{4787, 4783, 4795, 4737, 30, 14, 272, 45\}$

$$\int x^2\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx = -\frac{5d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2} + \frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx)) + \frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{256bc^3\sqrt{1-c^2x^2}} + \frac{5bd^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}} - \frac{59bcd^2x^4}{768\sqrt{}}$$

```
[In] Int[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (5*b*d^2*x^2*Sqrt[d - c^2*d*x^2])/(256*c*Sqrt[1 - c^2*x^2]) - (59*b*c*d^2*x
^4*Sqrt[d - c^2*d*x^2])/(768*Sqrt[1 - c^2*x^2]) + (17*b*c^3*d^2*x^6*Sqrt[d
- c^2*d*x^2])/(288*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^8*Sqrt[d - c^2*d*x^2])
/(64*Sqrt[1 - c^2*x^2]) - (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))
/(128*c^2) + (5*d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/64 + (5*d*
x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/48 + (x^3*(d - c^2*d*x^2)^(5
/2)*(a + b*ArcSin[c*x]))/8 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])
^2)/(256*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
```

```
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))+\frac{1}{8}(5d)\int x^2\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int x^3\left(1-c^2x^2\right)^2\,dx}{8\sqrt{1-c^2x^2}}$$

$$= \frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx)) + \frac{1}{16}\left(5d^2\right)\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x\left(1-c^2x\right)^2\,dx,x,x^2\right)}{16\sqrt{1-c^2x^2}} - \frac{\left(5bcd^2\sqrt{d-c^2dx^2}\right)\int x^3\left(1-c^2x^2\right)\,dx}{48\sqrt{1-c^2x^2}}$$

$$= \frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))+\frac{\left(5d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{64\sqrt{1-c^2x^2}} - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(x-2c^2x^2+c^4x^3\right)\,dx,x,x^2\right)}{16\sqrt{1-c^2x^2}} - \frac{\left(5bcd^2\sqrt{d-c^2dx^2}\right)\int x^3\,dx}{64\sqrt{1-c^2x^2}}-\frac{\left(5bcd^2\sqrt{d-c^2dx^2}\right)\int\left(x^3-c^2x^5\right)\,dx}{48\sqrt{1-c^2x^2}}$$

$$= -\frac{59bcd^2x^4\sqrt{d-c^2dx^2}}{768\sqrt{1-c^2x^2}}+\frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}}{288\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}} - \frac{5d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2}+\frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx)) + \frac{\left(5d^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{128c^2\sqrt{1-c^2x^2}}+\frac{\left(5bd^2\sqrt{d-c^2dx^2}\right)\int x\,dx}{128c\sqrt{1-c^2x^2}}$$

$$= \frac{5bd^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}-\frac{59bcd^2x^4\sqrt{d-c^2dx^2}}{768\sqrt{1-c^2x^2}}+\frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}}{288\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}-\frac{5d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2} + \frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))+\frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{256bc^3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 196, normalized size of antiderivative = 0.56

$$\int x^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx=\frac{d^2\sqrt{d-c^2dx^2}\left(45a^2+b^2c^2x^2(45-177c^2x^2+136c^4x^4-36c^6x^6)+6abcx\sqrt{1-c^2x^2}(-15+\right.}{}$$

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(45*a^2 + b^2*c^2*x^2*(45 - 177*c^2*x^2 + 136*c^4*
x^4 - 36*c^6*x^6) + 6*a*b*c*x*Sqrt[1 - c^2*x^2]*(-15 + 118*c^2*x^2 - 136*c^
4*x^4 + 48*c^6*x^6) + 6*b*(15*a + b*c*x*Sqrt[1 - c^2*x^2]*(-15 + 118*c^2*x^
2 - 136*c^4*x^4 + 48*c^6*x^6))*ArcSin[c*x] + 45*b^2*ArcSin[c*x]^2))/(2304*b
*c^3*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.18 (sec) , antiderivative size = 907, normalized size of antiderivative = 2.58

method	result
default	$-\frac{ax(-c^2dx^2+d)^{\frac{7}{2}}}{8c^2d}+\frac{ax(-c^2dx^2+d)^{\frac{5}{2}}}{48c^2}+\frac{5adx(-c^2dx^2+d)^{\frac{3}{2}}}{192c^2}+\frac{5ad^2x\sqrt{-c^2dx^2+d}}{128c^2}+\frac{5ad^3\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{128c^2\sqrt{c^2d}}+b\Big(-$
parts	$-\frac{ax(-c^2dx^2+d)^{\frac{7}{2}}}{8c^2d}+\frac{ax(-c^2dx^2+d)^{\frac{5}{2}}}{48c^2}+\frac{5adx(-c^2dx^2+d)^{\frac{3}{2}}}{192c^2}+\frac{5ad^2x\sqrt{-c^2dx^2+d}}{128c^2}+\frac{5ad^3\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{128c^2\sqrt{c^2d}}+b\Big(-$

```
[In] int(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8*a*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+1/48*a/c^2*x*(-c^2*d*x^2+d)^(5/2)+5/192
*a/c^2*d*x*(-c^2*d*x^2+d)^(3/2)+5/128*a/c^2*d^2*x*(-c^2*d*x^2+d)^(1/2)+5/12
8*a/c^2*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-
5/256*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)
^2*d^2+1/16384*(-d*(c^2*x^2-1))^(1/2)*(-128*I*(-c^2*x^2+1)^(1/2)*x^8*c^8+12
8*c^9*x^9+256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320*c^7*x^7-160*I*(-c^2*x^2+1)^(
1/2)*x^4*c^4+272*c^5*x^5+32*I*(-c^2*x^2+1)^(1/2)*c^2*x^2-88*c^3*x^3-I*(-c^2
*x^2+1)^(1/2)+8*c*x)*(8*arcsin(c*x)+I)*d^2/c^3/(c^2*x^2-1)+1/256*(-d*(c^2*x
^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)
-2*c*x)*(-I+2*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)+1/147456*(-d*(c^2*x^2-1))^(1
/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(73*I+312*arcsin(c*x))*cos(7*arcsi
n(c*x))*d^2/c^3/(c^2*x^2-1)-1/147456*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)
^(1/2)*x*c+c^2*x^2-1)*(55*I+456*arcsin(c*x))*sin(7*arcsin(c*x))*d^2/c^3/(c^
```

```
2*x^2-1)+1/9216*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)
*(13*I+12*arcsin(c*x))*cos(5*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-5/9216*(-d*(c
^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(I+12*arcsin(c*x))*si
n(5*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-3/1024*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x
^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(4*arcsin(c*x)+I)*cos(3*arcsin(c*x))*d^2/c^3/(
c^2*x^2-1)+1/1024*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-
1)*(5*I+4*arcsin(c*x))*sin(3*arcsin(c*x))*d^2/c^3/(c^2*x^2-1))
```

Fricas [F]

$$\int x^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx=\int(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^6 - 2*a*c^2*d^2*x^4 + a*d^2*x^2 + (b*c^4*d^2*x^6 - 2*
b*c^2*d^2*x^4 + b*d^2*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int x^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx=\text{Timed out}$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int x^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx=\int(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate((c^4*d^2*x^6 - 2*c^2*d^2*x^4 + d^2*x^2)*sqrt(c*x + 1)*s
qrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/384*(8*(-c
^2*d*x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d) + 10*(-c^2*
d*x^2 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 + 15*d^(5/2)*a
rcsin(c*x)/c^3)*a
```

Giac [F]

$$\int x^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx=\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin{(cx)}+a)x^2\,dx$$

[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")

[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)*x^2, x)

Mupad [F(-1)]

Timed out.

$$\int x^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx=\int x^2\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

[In] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)

[Out] int(x^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)

3.86 $\int (d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 24, antiderivative size = 265

$$\int (d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx = -\frac{25bcd^2x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{5bc^3d^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}$$
$$+\frac{bd^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c}+\frac{5}{16}d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+\frac{5}{24}dx(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))+\frac{1}{6}x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))+\frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx}{32bc\sqrt{1-c^2x^2}}$$

```
[Out] 5/24*d*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+1/6*x*(-c^2*d*x^2+d)^(5/2)*
(a+b*arcsin(c*x))+1/36*b*d^2*(-c^2*x^2+1)^(5/2)*(-c^2*d*x^2+d)^(1/2)/c+5/16
*d^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-25/96*b*c*d^2*x^2*(-c^2*d*x^2
+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/96*b*c^3*d^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*
x^2+1)^(1/2)+5/32*d^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^
2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 265, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4743, 4741, 4737, 30, 14, 267}

$$\int (d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx = \frac{5}{16}d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+\frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}}+\frac{1}{6}x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))$$
$$+\frac{5}{24}dx(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))-\frac{25bcd^2x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{bd^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c}+\frac{5bc^3d^2x^4\sqrt{d-}}{96\sqrt{1-c}}$$

```
[In] Int[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-25*b*c*d^2*x^2*Sqrt[d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d^2
*x^4*Sqrt[d - c^2*d*x^2])/(96*Sqrt[1 - c^2*x^2]) + (b*d^2*(1 - c^2*x^2)^(5/
2)*Sqrt[d - c^2*d*x^2])/(36*c) + (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x]))/16 + (5*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/24 + (x*(d -
 c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/6 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x])^2)/(32*b*c*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
```

```
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))+\frac{1}{6}(5d)\int\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx-\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)^2\,dx}{6\sqrt{1-c^2x^2}}$$

$$=\frac{bd^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c}+\frac{5}{24}dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))+\frac{1}{8}\left(5d^2\right)\int\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx-\frac{\left(5bcd^2\sqrt{d-c^2\right.}{24}$$

$$=\frac{bd^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c}+\frac{5}{16}d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{5}{24}dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))+\frac{\left(5d^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}}-\frac{\left(5bcd^2\sqrt{d-c^2dx^2}\right)\int (}{24\sqrt{1-c^2}}$$

$$=-\frac{25bcd^2x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{5bc^3d^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{bd^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c}+\frac{5}{16}d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{5}{24}dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))+\frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.80 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.00

$$\int\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\frac{d^2\left(360b\sqrt{d-c^2dx^2}\arcsin(cx)^2-720a\sqrt{d}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right)+\sqrt{d-c^2dx\right.}{}$$

```
[In] Integrate[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
[Out] (d^2*(360*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2 - 720*a*Sqrt[d]*Sqrt[1 - c^2*
x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + Sqrt[d -
c^2*d*x^2]*(1584*a*c*x*Sqrt[1 - c^2*x^2] - 1248*a*c^3*x^3*Sqrt[1 - c^2*x^2]
```

```
 + 384*a*c^5*x^5*Sqrt[1 - c^2*x^2] + 270*b*Cos[2*ArcSin[c*x]] + 27*b*Cos[4*
ArcSin[c*x]] + 2*b*Cos[6*ArcSin[c*x]]) + 12*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*
x]*(45*Sin[2*ArcSin[c*x]] + 9*Sin[4*ArcSin[c*x]] + Sin[6*ArcSin[c*x]])))/(2
304*c*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.16 (sec) , antiderivative size = 691, normalized size of antiderivative = 2.61

method	result
default	$\frac{ax(-c^2dx^2+d)^{\frac{5}{2}}}{6}+\frac{5adx(-c^2dx^2+d)^{\frac{3}{2}}}{24}+\frac{5ad^2x\sqrt{-c^2dx^2+d}}{16}+\frac{5ad^3\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{16\sqrt{c^2d}}+b\left(-\frac{5\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x}}{32c(c^2x^2}\right.$
parts	$\frac{ax(-c^2dx^2+d)^{\frac{5}{2}}}{6}+\frac{5adx(-c^2dx^2+d)^{\frac{3}{2}}}{24}+\frac{5ad^2x\sqrt{-c^2dx^2+d}}{16}+\frac{5ad^3\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{16\sqrt{c^2d}}+b\left(-\frac{5\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x}}{32c(c^2x^2}\right.$

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*a*x*(-c^2*d*x^2+d)^(5/2)+5/24*a*d*x*(-c^2*d*x^2+d)^(3/2)+5/16*a*d^2*x*(
-c^2*d*x^2+d)^(1/2)+5/16*a*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d
*x^2+d)^(1/2))+b*(-5/32*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^
2-1)*arcsin(c*x)^2*d^2+1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1
/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^
2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*(I+6*arcsin(c
*x))*d^2/c/(c^2*x^2-1)+15/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2
)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*d^2/c/(c
^2*x^2-1)-1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I
)*(29*I+96*arcsin(c*x))*cos(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)+5/4608*(-d*(c^
2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(5*I+24*arcsin(c*x))*s
in(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)-3/512*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2
-c*x*(-c^2*x^2+1)^(1/2)-I)*(11*I+16*arcsin(c*x))*cos(3*arcsin(c*x))*d^2/c/(
c^2*x^2-1)+9/512*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1
)*(3*I+8*arcsin(c*x))*sin(3*arcsin(c*x))*d^2/c/(c^2*x^2-1))
```

Fricas [F]

$$\int \left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin{(cx)}+a)\,dx$$

[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)

Sympy [F(-1)]

Timed out.

$$\int \left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\text{Timed out}$$

[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)

[Out] Timed out

Maxima [F]

$$\int \left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin{(cx)}+a)\,dx$$

[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] b*sqrt(d)*integrate((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt(-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a

Giac [F(-2)]

Exception generated.

$$\int \left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\text{Exception raised: TypeError}$$

[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\int (a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
[Out] int((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.87 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 268

$$\begin{aligned}\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^2}\,dx &= \frac{9bc^3d^2x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}\\ &-\frac{bc^5d^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}-\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\\ &-\frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))-\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x}\\ &-\frac{15cd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16b\sqrt{1-c^2x^2}}+\frac{bcd^2\sqrt{d-c^2dx^2}\log(x)}{\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] -5/4*c^2*d*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))-(-c^2*d*x^2+d)^(5/2)*(a
+b*arcsin(c*x))/x-15/8*c^2*d^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+9/1
6*b*c^3*d^2*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/16*b*c^5*d^2*x^4*
(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-15/16*c*d^2*(a+b*arcsin(c*x))^2*(-c
^2*d*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)+b*c*d^2*ln(x)*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used

$= \{4785, 4743, 4741, 4737, 30, 14, 272, 45\}$

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^2}\,dx = -\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{15cd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16b\sqrt{1-c^2x^2}} - \frac{5}{4}c^2dx(d-c^2dx^2)^{3/2}(a+b\arcsin(cx)) - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x} + \frac{bcd^2\log(x)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{9bc^3d^2x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (9*b*c^3*d^2*x^2*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x
^4*Sqrt[d - c^2*d*x^2])/(16*Sqrt[1 - c^2*x^2]) - (15*c^2*d^2*x*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x]))/8 - (5*c^2*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*Ar
cSin[c*x]))/4 - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x - (15*c*d^2*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*Sqrt[1 - c^2*x^2]) + (b*c*d
^2*Sqrt[d - c^2*d*x^2]*Log[x])/Sqrt[1 - c^2*x^2]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{x}\\ &\quad -\left(5c^2d\right)\int\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx+\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\frac{\left(1-c^2x^2\right)^2}{x}\,dx}{\sqrt{1-c^2x^2}}\end{aligned}$$

$$= -\frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{x} - \frac{1}{4}\left(15c^2d^2\right)\int\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx + \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{(1-c^2x)^2}{x}\,dx,x,x^2\right)}{2\sqrt{1-c^2x^2}} + \frac{\left(5bc^3d^2\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)\,dx}{4\sqrt{1-c^2x^2}}$$

$$= -\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{x} + \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(-2c^2+\frac{1}{x}+c^4x\right)\,dx,x,x^2\right)}{2\sqrt{1-c^2x^2}} - \frac{\left(15c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} + \frac{\left(5bc^3d^2\sqrt{d-c^2dx^2}\right)\int\left(x-c^2x^3\right)\,dx}{4\sqrt{1-c^2x^2}} + \frac{\left(15bc^3d^2\sqrt{d-c^2dx^2}\right)\int x\,dx}{8\sqrt{1-c^2x^2}}$$

$$= \frac{9bc^3d^2x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{x} - \frac{15cd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16b\sqrt{1-c^2x^2}} + \frac{bcd^2\sqrt{d-c^2dx^2}\log(x)}{\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.75 (sec) , antiderivative size = 257, normalized size of antiderivative = 0.96

$$\int\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{x^2}\,dx = \frac{d^2\left(-120bcx\sqrt{d-c^2dx^2}\arcsin(cx)^2+240ac\sqrt{d}x\sqrt{1-c^2x^2}\arctan\left(\right.\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (d^2*(-120*b*c*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2 + 240*a*c*Sqrt[d]*x*Sqrt
[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] +
Sqrt[d - c^2*d*x^2]*(-32*b*c*x*Cos[2*ArcSin[c*x]] - b*c*x*Cos[4*ArcSin[c*x]
] + 16*(a*Sqrt[1 - c^2*x^2]*(-8 - 9*c^2*x^2 + 2*c^4*x^4) + 8*b*c*x*Log[c*x]
)) - 4*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*(32*Sqrt[1 - c^2*x^2] + 16*c*x*Sin
[2*ArcSin[c*x]] + c*x*Sin[4*ArcSin[c*x]])))/(128*x*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.21 (sec) , antiderivative size = 306, normalized size of antiderivative = 1.14

method	result
default	$-\frac{a(-c^2d\,x^2+d)^{\frac{7}{2}}}{dx}-a\,c^2x(-c^2d\,x^2+d)^{\frac{5}{2}}-\frac{5a\,c^2dx(-c^2d\,x^2+d)^{\frac{3}{2}}}{4}-\frac{15a\,c^2d^2x\sqrt{-c^2d\,x^2+d}}{8}-\frac{15a\,c^2d^3\arctan\left(\frac{\sqrt{}}{\sqrt{-c}}\right.}{8\sqrt{c^2d}}$
parts	$-\frac{a(-c^2d\,x^2+d)^{\frac{7}{2}}}{dx}-a\,c^2x(-c^2d\,x^2+d)^{\frac{5}{2}}-\frac{5a\,c^2dx(-c^2d\,x^2+d)^{\frac{3}{2}}}{4}-\frac{15a\,c^2d^2x\sqrt{-c^2d\,x^2+d}}{8}-\frac{15a\,c^2d^3\arctan\left(\frac{\sqrt{}}{\sqrt{-c}}\right.}{8\sqrt{c^2d}}$

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -a/d/x*(-c^2*d*x^2+d)^(7/2)-a*c^2*x*(-c^2*d*x^2+d)^(5/2)-5/4*a*c^2*d*x*(-c^
2*d*x^2+d)^(3/2)-15/8*a*c^2*d^2*x*(-c^2*d*x^2+d)^(1/2)-15/8*a*c^2*d^3/(c^2*
d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+1/128*b*(-d*(c^2*x^2-
1))^(1/2)*(-c^2*x^2+1)^(1/2)/x/(c^2*x^2-1)*(-32*(-c^2*x^2+1)^(1/2)*arcsin(c
*x)*x^4*c^4+8*c^5*x^5+144*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-72*c^3*x^3
+120*c*x*arcsin(c*x)^2+128*I*arcsin(c*x)*x*c-128*ln((I*c*x+(-c^2*x^2+1)^(1/
2))^2-1)*x*c+128*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+33*c*x)*d^2
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^2}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin{(cx)}+a)}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^2, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^2}\,dx=\int \frac{(-d(cx-1)\,(cx+1))^{\frac{5}{2}}\,(a+b\operatorname{asin}{(cx)})}{x^2}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**2,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))/x**2, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^2}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^2, x) - 1/8*(10*(-c^
2*d*x^2 + d)^(3/2)*c^2*d*x + 15*sqrt(-c^2*d*x^2 + d)*c^2*d^2*x + 15*c*d^(5/
2)*arcsin(c*x) + 8*(-c^2*d*x^2 + d)^(5/2)/x)*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)^{5/2}}{x^2}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^2, x)
```

3.88 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^4}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 277

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^4}\,dx = -\frac{bcd^2\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} + \frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{3x^3} + \frac{5c^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4b\sqrt{1-c^2x^2}} - \frac{7bc^3d^2\sqrt{d-c^2dx^2}\log(x)}{3\sqrt{1-c^2x^2}}$$

```
[Out] 5/3*c^2*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x-1/3*(-c^2*d*x^2+d)^(5/2)
*(a+b*arcsin(c*x))/x^3+5/2*c^4*d^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)
-1/6*b*c*d^2*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)-1/4*b*c^5*d^2*x^2*
(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/4*c^3*d^2*(a+b*arcsin(c*x))^2*(-c
^2*d*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)-7/3*b*c^3*d^2*ln(x)*(-c^2*d*x^2+d)^(
1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used

$= \{4785, 4741, 4737, 30, 14, 272, 45\}$

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^4}\,dx = \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{3x^3} + \frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5c^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4b\sqrt{1-c^2x^2}} - \frac{bcd^2\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^2\sqrt{d-}}{4\sqrt{1-c^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/6*(b*c*d^2*Sqrt[d - c^2*d*x^2])/(x^2*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^2
*Sqrt[d - c^2*d*x^2])/(4*Sqrt[1 - c^2*x^2]) + (5*c^4*d^2*x*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x]))/2 + (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c
*x]))/(3*x) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(3*x^3) + (5*c^3*
d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*Sqrt[1 - c^2*x^2]) - (7
*b*c^3*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(3*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{3x^3} \\
&\quad -\frac{1}{3}\left(5c^2d\right)\int\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^2}\,dx \\
&\quad +\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\frac{(1-c^2x^2)^2}{x^3}\,dx}{3\sqrt{1-c^2x^2}} \\
&= \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x}-\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{3x^3} \\
&\quad +\left(5c^4d^2\right)\int\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx \\
&\quad +\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{(1-c^2x)^2}{x^2}\,dx,x,x^2\right)}{6\sqrt{1-c^2x^2}}-\frac{\left(5bc^3d^2\sqrt{d-c^2dx^2}\right)\int\frac{1-c^2x^2}{x}\,dx}{3\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= \frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{3x^3} + \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(c^4+\frac{1}{x^2}-\frac{2c^2}{x}\right)dx,x,x^2\right)}{6\sqrt{1-c^2x^2}} - \frac{\left(5bc^3d^2\sqrt{d-c^2dx^2}\right)\int\left(\frac{1}{x}-c^2x\right)dx}{3\sqrt{1-c^2x^2}} + \frac{\left(5c^4d^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}dx}{2\sqrt{1-c^2x^2}} - \frac{\left(5bc^5d^2\sqrt{d-c^2dx^2}\right)\int x\,dx}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{6x^2\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} + \frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{3x^3} + \frac{5c^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4b\sqrt{1-c^2x^2}} - \frac{7bc^3d^2\sqrt{d-c^2dx^2}\log(x)}{3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 1.08 (sec) , antiderivative size = 243, normalized size of antiderivative = 0.88

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^4}dx = \frac{1}{24}d^2\left(\frac{4b\sqrt{d-c^2dx^2}(-2+14c^2x^2+3c^4x^4)\arcsin(cx)}{x^3} + \frac{30bc^3\sqrt{d-c^2dx^2}\arcsin(cx)^2}{\sqrt{1-c^2x^2}} - 60ac^3\sqrt{d}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right) + \frac{\sqrt{d-c^2dx^2}\left(4a\sqrt{1-c^2x^2}(-2+14c^2x^2+3c^4x^4)+b(-4cx+3c^3x^3-6c^5x^5)-56bc^3x^3\log(cx)\right)}{x^3\sqrt{1-c^2x^2}}\right)$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (d^2*((4*b*Sqrt[d - c^2*d*x^2]*(-2 + 14*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x])/x
^3 + (30*b*c^3*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] - 60*a*
c^3*Sqrt[d]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + (S
qrt[d - c^2*d*x^2]*(4*a*Sqrt[1 - c^2*x^2]*(-2 + 14*c^2*x^2 + 3*c^4*x^4) + b
*(-4*c*x + 3*c^3*x^3 - 6*c^5*x^5) - 56*b*c^3*x^3*Log[c*x]))/(x^3*Sqrt[1 - c
^2*x^2])))/24
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.20 (sec) , antiderivative size = 343, normalized size of antiderivative = 1.24

method	result
default	$-\frac{a(-c^2dx^2+d)^{\frac{7}{2}}}{3d\,x^3}+\frac{4a\,c^2(-c^2dx^2+d)^{\frac{7}{2}}}{3dx}+\frac{4a\,c^4x(-c^2dx^2+d)^{\frac{5}{2}}}{3}+\frac{5a\,c^4dx(-c^2dx^2+d)^{\frac{3}{2}}}{3}+\frac{5a\,c^4d^2x\sqrt{-c^2dx^2+d}}{2}+$ 5a c
parts	$-\frac{a(-c^2dx^2+d)^{\frac{7}{2}}}{3d\,x^3}+\frac{4a\,c^2(-c^2dx^2+d)^{\frac{7}{2}}}{3dx}+\frac{4a\,c^4x(-c^2dx^2+d)^{\frac{5}{2}}}{3}+\frac{5a\,c^4dx(-c^2dx^2+d)^{\frac{3}{2}}}{3}+\frac{5a\,c^4d^2x\sqrt{-c^2dx^2+d}}{2}+$ 5a c

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*a/d/x^3*(-c^2*d*x^2+d)^(7/2)+4/3*a*c^2/d/x*(-c^2*d*x^2+d)^(7/2)+4/3*a*
c^4*x*(-c^2*d*x^2+d)^(5/2)+5/3*a*c^4*d*x*(-c^2*d*x^2+d)^(3/2)+5/2*a*c^4*d^2
*x*(-c^2*d*x^2+d)^(1/2)+5/2*a*c^4*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/
(-c^2*d*x^2+d)^(1/2))-1/24*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2
*x^2-1)/x^3*(12*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4*c^4-6*c^5*x^5+30*c^3*x^3
*arcsin(c*x)^2+56*I*arcsin(c*x)*x^3*c^3-56*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-
1)*x^3*c^3+56*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2+3*c^3*x^3-8*arcsin(c*x
)*(-c^2*x^2+1)^(1/2)-4*c*x)*d^2
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^4}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^4, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^4}\,dx=\int \frac{(-d(cx-1)(cx+1))^{\frac{5}{2}}(a+b\operatorname{asin}(cx))}{x^4}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**4,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))/x**4, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^4}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^4, x) + 1/6*(10*(-c^
2*d*x^2 + d)^(3/2)*c^4*d*x + 15*sqrt(-c^2*d*x^2 + d)*c^4*d^2*x + 15*c^3*d^(
5/2)*arcsin(c*x) + 8*(-c^2*d*x^2 + d)^(5/2)*c^2/x - 2*(-c^2*d*x^2 + d)^(7/2
)/(d*x^3))*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^4}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)^{5/2}}{x^4}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^4, x)
```

3.89 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^6}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 277

$$\begin{aligned}\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^6}\,dx &= -\frac{bcd^2\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}} \\ &+ \frac{11bc^3d^2\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}} - \frac{c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x} \\ &+ \frac{c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x^3} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5x^5} \\ &- \frac{c^5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2b\sqrt{1-c^2x^2}} + \frac{23bc^5d^2\sqrt{d-c^2dx^2}\log(x)}{15\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] 1/3*c^2*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^3-1/5*(-c^2*d*x^2+d)^(5/
2)*(a+b*arcsin(c*x))/x^5-c^4*d^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/x-1
/20*b*c*d^2*(-c^2*d*x^2+d)^(1/2)/x^4/(-c^2*x^2+1)^(1/2)+11/30*b*c^3*d^2*(-c
^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)-1/2*c^5*d^2*(a+b*arcsin(c*x))^2*(-
c^2*d*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)+23/15*b*c^5*d^2*ln(x)*(-c^2*d*x^2+d
)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used

$= \{4785, 4781, 29, 4737, 14, 272, 45\}$

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^6}\,dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5x^5} + \frac{c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x^3} - \frac{c^5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2b\sqrt{1-c^2x^2}} - \frac{c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x} - \frac{bcd^2\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}} + \frac{23bc^5d^2\log(x)\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{11bc^3d^2\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] -1/20*(b*c*d^2*Sqrt[d - c^2*d*x^2])/(x^4*Sqrt[1 - c^2*x^2]) + (11*b*c^3*d^2
*Sqrt[d - c^2*d*x^2])/(30*x^2*Sqrt[1 - c^2*x^2]) - (c^4*d^2*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x]))/x + (c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*
x]))/(3*x^3) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*x^5) - (c^5*d
^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*Sqrt[1 - c^2*x^2]) + (23
*b*c^5*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(15*Sqrt[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
```

```
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5x^5} \\
&\quad -(c^2d)\int\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x^4}\,dx+\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\frac{(1-c^2x^2)^2}{x^5}\,dx}{5\sqrt{1-c^2x^2}} \\
&= \frac{c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x^3}-\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5x^5} \\
&\quad +(c^4d^2)\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x^2}\,dx \\
&\quad +\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{(1-c^2x)^2}{x^3}\,dx,x,x^2\right)}{10\sqrt{1-c^2x^2}}-\frac{\left(bc^3d^2\sqrt{d-c^2dx^2}\right)\int\frac{1-c^2x^2}{x^3}\,dx}{3\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x} + \frac{c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x^3} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5x^5} + \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{x^3}-\frac{2c^2}{x^2}+\frac{c^4}{x}\right)dx,x,x^2\right)}{10\sqrt{1-c^2x^2}} - \frac{\left(bc^3d^2\sqrt{d-c^2dx^2}\right)\int\left(\frac{1}{x^3}-\frac{c^2}{x}\right)dx}{3\sqrt{1-c^2x^2}} + \frac{\left(bc^5d^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{x}dx}{\sqrt{1-c^2x^2}} - \frac{\left(c^6d^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{20x^4\sqrt{1-c^2x^2}} + \frac{11bc^3d^2\sqrt{d-c^2dx^2}}{30x^2\sqrt{1-c^2x^2}} - \frac{c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x} + \frac{c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3x^3} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5x^5} - \frac{c^5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2b\sqrt{1-c^2x^2}} + \frac{23bc^5d^2\sqrt{d-c^2dx^2}\log(x)}{15\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 1.10 (sec) , antiderivative size = 234, normalized size of antiderivative = 0.84

$$\int\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^6}dx = \frac{1}{60}d^2\left(-\frac{4b\sqrt{d-c^2dx^2}(3-11c^2x^2+23c^4x^4)\arcsin(cx)}{x^5} - \frac{30bc^5\sqrt{d-c^2dx^2}\arcsin(cx)^2}{\sqrt{1-c^2x^2}} + 60ac^5\sqrt{d}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right) + \frac{\sqrt{d-c^2dx^2}\left(bcx(-3+22c^2x^2)-4a\sqrt{1-c^2x^2}(3-11c^2x^2+23c^4x^4)+92bc^5x^5\log(cx)\right)}{x^5\sqrt{1-c^2x^2}}\right)$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^6,x]
```

```
[Out] (d^2*((-4*b*Sqrt[d - c^2*d*x^2]*(3 - 11*c^2*x^2 + 23*c^4*x^4)*ArcSin[c*x])/
x^5 - (30*b*c^5*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] + 60*a
*c^5*Sqrt[d]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + (
Sqrt[d - c^2*d*x^2]*(b*c*x*(-3 + 22*c^2*x^2) - 4*a*Sqrt[1 - c^2*x^2]*(3 - 1
1*c^2*x^2 + 23*c^4*x^4) + 92*b*c^5*x^5*Log[c*x]))/(x^5*Sqrt[1 - c^2*x^2])))
/60
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.24 (sec) , antiderivative size = 2615, normalized size of antiderivative = 9.44

method	result	size
default	Expression too large to display	2615
parts	Expression too large to display	2615

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^6,x,method=_RETURNVERBOSE)
```

```
[Out] -1/5*a/d/x^5*(-c^2*d*x^2+d)^(7/2)-8/15*a*c^6*x*(-c^2*d*x^2+d)^(5/2)+1173*I*
b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x
^2+9)*x^6/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^11-1495/3*I*b*(-d*(c
^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^
4/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^9+115*I*b*(-d*(c^2*x^2-1))^(
1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^2/(c^2*x^2-1
)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^7-1587*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1
035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^8/(c^2*x^2-1)*arcsin(c*
x)*(-c^2*x^2+1)^(1/2)*c^13+2/15*a*c^2/d/x^3*(-c^2*d*x^2+d)^(7/2)-8/15*a*c^4
/d/x*(-c^2*d*x^2+d)^(7/2)-2/3*a*c^6*d*x*(-c^2*d*x^2+d)^(3/2)-a*c^6*d^2*x*(-
c^2*d*x^2+d)^(1/2)-a*c^6*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x
^2+d)^(1/2))+9/5*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325
*c^4*x^4-75*c^2*x^2+9)/x^5/(c^2*x^2-1)*arcsin(c*x)+1/2*b*(-d*(c^2*x^2-1))^(
1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*c^5*d^2+175/4*b*(-d*(c^2*
x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)/(c^2*
x^2-1)*c^5*(-c^2*x^2+1)^(1/2)-23/15*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(
1/2)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^5*d^2-759/2*b*(-d*(c^
2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^6
/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^11-9595/3*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1
035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^5/(c^2*x^2-1)*arcsin(c*
x)*c^10+1329/4*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c
^4*x^4-75*c^2*x^2+9)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^9+5318/3*b*(-d*(c
^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^
3/(c^2*x^2-1)*arcsin(c*x)*c^8-1889/12*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^
8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^2/(c^2*x^2-1)*c^7*(-c^2*x^2+1
)^(1/2)-9602/15*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*
c^4*x^4-75*c^2*x^2+9)*x/(c^2*x^2-1)*arcsin(c*x)*c^6+777/5*b*(-d*(c^2*x^2-1)
)^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)/x/(c^2*x^2-
1)*arcsin(c*x)*c^4-1587*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*
x^6+325*c^4*x^4-75*c^2*x^2+9)*x^9/(c^2*x^2-1)*arcsin(c*x)*c^14-141/20*b*(-d
*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)
/x^2/(c^2*x^2-1)*c^3*(-c^2*x^2+1)^(1/2)-117/5*b*(-d*(c^2*x^2-1))^(1/2)*d^2/
(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)/x^3/(c^2*x^2-1)*arcsin(
c*x)*c^2+9/20*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^
```

```
4*x^4-75*c^2*x^2+9)/x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+46*I*b*(-d*(c^2*x^
2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5*d^2/(15*c^2*x^2-15)+5819/30*
I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2
*x^2+9)*x^9/(c^2*x^2-1)*c^14-18791/60*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*
c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^7/(c^2*x^2-1)*c^12-207/5*I*
b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x
^2+9)*x^3/(c^2*x^2-1)*c^8+943/6*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^
8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^5/(c^2*x^2-1)*c^10+69/20*I*b*(-d*
(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*
x/(c^2*x^2-1)*c^6+3519*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x
^6+325*c^4*x^4-75*c^2*x^2+9)*x^7/(c^2*x^2-1)*arcsin(c*x)*c^12+5819/30*I*b*(
-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+
9)*x^7/(c^2*x^2-1)*(-c^2*x^2+1)*c^12-7153/60*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2
/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x^5/(c^2*x^2-1)*(-c^2*
x^2+1)*c^10-69/5*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+3
25*c^4*x^4-75*c^2*x^2+9)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+759
/20*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75
*c^2*x^2+9)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^8-69/20*I*b*(-d*(c^2*x^2-1))^(1/
2)*d^2/(1035*c^8*x^8-765*c^6*x^6+325*c^4*x^4-75*c^2*x^2+9)*x/(c^2*x^2-1)*(-
c^2*x^2+1)*c^6
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^6}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{x^6}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^6, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^6}\,dx = \int \frac{(-d(cx-1)(cx+1))^{\frac{5}{2}}\,(a+b\,\mathrm{asin}(cx))}{x^6}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**6,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))/x**6, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^6}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin{(cx)}+a)}{x^6}\,dx$$

[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="maxima")

[Out] b*sqrt(d)*integrate((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^6, x) - 1/15*(10*(-c^2*d*x^2 + d)^(3/2)*c^6*d*x + 15*sqrt(-c^2*d*x^2 + d)*c^6*d^2*x + 15*c^5*d^(5/2)*arcsin(c*x) + 8*(-c^2*d*x^2 + d)^(5/2)*c^4/x - 2*(-c^2*d*x^2 + d)^(7/2)*c^2/(d*x^3) + 3*(-c^2*d*x^2 + d)^(7/2)/(d*x^5))*a

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^6}\,dx=\text{Exception raised: TypeError}$$

[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^6,x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^6}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}}{x^6}\,dx$$

[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^6,x)

[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^6, x)

3.90 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^8}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 203

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^8}\,dx = -\frac{bcd^2\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}} + \frac{3bc^3d^2\sqrt{d-c^2dx^2}}{28x^4\sqrt{1-c^2x^2}} - \frac{3bc^5d^2\sqrt{d-c^2dx^2}}{14x^2\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7dx^7} - \frac{bc^7d^2\sqrt{d-c^2dx^2}\log(x)}{7\sqrt{1-c^2x^2}}$$

```
[Out] -1/7*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/d/x^7-1/42*b*c*d^2*(-c^2*d*x^2+
d)^(1/2)/x^6/(-c^2*x^2+1)^(1/2)+3/28*b*c^3*d^2*(-c^2*d*x^2+d)^(1/2)/x^4/(-c
^2*x^2+1)^(1/2)-3/14*b*c^5*d^2*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)-
1/7*b*c^7*d^2*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4771, 272, 45}

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^8}\,dx = -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7dx^7} - \frac{bcd^2\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}} - \frac{bc^7d^2\log(x)\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} - \frac{3bc^5d^2\sqrt{d-c^2dx^2}}{14x^2\sqrt{1-c^2x^2}} + \frac{3bc^3d^2\sqrt{d-c^2dx^2}}{28x^4\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] -1/42*(b*c*d^2*Sqrt[d - c^2*d*x^2])/(x^6*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d^2*
Sqrt[d - c^2*d*x^2])/(28*x^4*Sqrt[1 - c^2*x^2]) - (3*b*c^5*d^2*Sqrt[d - c^2
*d*x^2])/(14*x^2*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[
```

```
c*x]))/(7*d*x^7) - (b*c^7*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(7*Sqrt[1 - c^2*x
^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7dx^7}+\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\frac{(1-c^2x^2)^3}{x^7}\,dx}{7\sqrt{1-c^2x^2}}\\
&= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7dx^7}+\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{(1-c^2x)^3}{x^4}\,dx,x,x^2\right)}{14\sqrt{1-c^2x^2}}\\
&= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7dx^7}\\
&\quad+\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{x^4}-\frac{3c^2}{x^3}+\frac{3c^4}{x^2}-\frac{c^6}{x}\right)\,dx,x,x^2\right)}{14\sqrt{1-c^2x^2}}\\
&= -\frac{bcd^2\sqrt{d-c^2dx^2}}{42x^6\sqrt{1-c^2x^2}}+\frac{3bc^3d^2\sqrt{d-c^2dx^2}}{28x^4\sqrt{1-c^2x^2}}-\frac{3bc^5d^2\sqrt{d-c^2dx^2}}{14x^2\sqrt{1-c^2x^2}}\\
&\quad-\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7dx^7}-\frac{bc^7d^2\sqrt{d-c^2dx^2}\log(x)}{7\sqrt{1-c^2x^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.31 (sec) , antiderivative size = 190, normalized size of antiderivative = 0.94

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^8}\,dx =$$
$$-\frac{d^2\sqrt{d-c^2dx^2}\Big(10bcx-45bc^3x^3+90bc^5x^5-147bc^7x^7+60a\sqrt{1-c^2x^2}-180ac^2x^2\sqrt{1-c^2x^2}+180ac^4x^4\sqrt{}}{420x^7\sqrt{1-c^2x^2}}$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^8,x]
```

```
[Out] -1/420*(d^2*Sqrt[d - c^2*d*x^2]*(10*b*c*x - 45*b*c^3*x^3 + 90*b*c^5*x^5 - 1
47*b*c^7*x^7 + 60*a*Sqrt[1 - c^2*x^2] - 180*a*c^2*x^2*Sqrt[1 - c^2*x^2] + 1
80*a*c^4*x^4*Sqrt[1 - c^2*x^2] - 60*a*c^6*x^6*Sqrt[1 - c^2*x^2] + 60*b*(1 -
 c^2*x^2)^(7/2)*ArcSin[c*x] + 60*b*c^7*x^7*Log[x]))/(x^7*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.27 (sec) , antiderivative size = 4031, normalized size of antiderivative = 19.86

method	result	size
default	Expression too large to display	4031
parts	Expression too large to display	4031

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^8,x,method=_RETURNVERBOSE)
```

```
[Out] I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*
x^6+21*c^4*x^4-7*c^2*x^2+1)*x^12/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)
*c^19-5*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8
-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcs
in(c*x)*c^13+3*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*
c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/
2)*arcsin(c*x)*c^11-I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^1
0+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1
)^(1/2)*arcsin(c*x)*c^9-3*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^
10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^10/(c^2*x^2-1)*(-c^
2*x^2+1)^(1/2)*arcsin(c*x)*c^17+5*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^
12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^8/(c^2*x^2-
1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^15-2*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x
^2+1)^(1/2)*arcsin(c*x)*c^7*d^2/(7*c^2*x^2-7)-3/14*I*b*(-d*(c^2*x^2-1))^(1/
2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2
+1)*x^13/(c^2*x^2-1)*c^20+27/28*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12
-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^11/(c^2*x^2-1
```

)*c^18-7*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^11/(c^2*x^2-1)*arcsin(c*x)*c^18-1/42*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x/(c^2*x^2-1)*c^8+17/84*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^10-73/42*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^9/(c^2*x^2-1)*c^16+67/42*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^7/(c^2*x^2-1)*c^14-11/14*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^12+23*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^9/(c^2*x^2-1)*arcsin(c*x)*c^16-47*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^7/(c^2*x^2-1)*arcsin(c*x)*c^14+119/12*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^13+66*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)*c^12+b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^13/(c^2*x^2-1)*arcsin(c*x)*c^20+41/28*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^2/(c^2*x^2-1)*c^5*(-c^2*x^2+1)^(1/2)+55/7*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)*c^4-47/4*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^11-66*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^10+109/12*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^2/(c^2*x^2-1)*c^9*(-c^2*x^2+1)^(1/2)+3/2*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^10/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^17-21/4*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^8/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^15-23/84*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^4/(c^2*x^2-1)*c^3*(-c^2*x^2+1)^(1/2)-11/7*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^5/(c^2*x^2-1)*arcsin(c*x)*c^2+1/42*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x^6/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c+330/7*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*c^8-165/7*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)*c^6-1/7*a/d/x^7*(-c^2*d*x^2+d)^(7/2)+1/7*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c

```
^7+17/28*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^
8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^5/(c^2*x^2-1)*(-c^2*x^2+1)*c^12-5/28
*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6
*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^10+1/42*I*b*(-d
*(c^2*x^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*
c^4*x^4-7*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*c^8-3/14*I*b*(-d*(c^2*x^2-1
))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c
^2*x^2+1)*x^11/(c^2*x^2-1)*(-c^2*x^2+1)*c^18+3/4*I*b*(-d*(c^2*x^2-1))^(1/2)
*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1
)*x^9/(c^2*x^2-1)*(-c^2*x^2+1)*c^16-83/84*I*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(7
*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2+1)*x^7/(
c^2*x^2-1)*(-c^2*x^2+1)*c^14+1/7*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2
)/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c^7*d^2-55/12*b*(-d*(c^2*x
^2-1))^(1/2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4
-7*c^2*x^2+1)/(c^2*x^2-1)*c^7*(-c^2*x^2+1)^(1/2)+1/7*b*(-d*(c^2*x^2-1))^(1/
2)*d^2/(7*c^12*x^12-21*c^10*x^10+35*c^8*x^8-35*c^6*x^6+21*c^4*x^4-7*c^2*x^2
+1)/x^7/(c^2*x^2-1)*arcsin(c*x)
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 655, normalized size of antiderivative = 3.23

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^8}\,dx = \left[\frac{6\,(bc^9d^2x^9-bc^7d^2x^7)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\,(x^4-\cdots}{c^2x^4-x^2}\right.}{\cdots}\right.$$

$$-\frac{12\,(bc^9d^2x^9-bc^7d^2x^7)\sqrt{-d}\arctan\left(\frac{\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\,(x^2+1)\sqrt{-d}}{c^2dx^4-(c^2+1)dx^2+d}\right)-(18\,bc^5d^2x^5-(18\,bc^5-9\,bc^3+2\,bc)d^2x\cdots}{\cdots}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="fricas")
```

```
[Out] [1/84*(6*(b*c^9*d^2*x^9 - b*c^7*d^2*x^7)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2
 - d*x^4 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(
c^2*x^4 - x^2)) + (18*b*c^5*d^2*x^5 - (18*b*c^5 - 9*b*c^3 + 2*b*c)*d^2*x^7
- 9*b*c^3*d^2*x^3 + 2*b*c*d^2*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) +
12*(a*c^8*d^2*x^8 - 4*a*c^6*d^2*x^6 + 6*a*c^4*d^2*x^4 - 4*a*c^2*d^2*x^2 + a
*d^2 + (b*c^8*d^2*x^8 - 4*b*c^6*d^2*x^6 + 6*b*c^4*d^2*x^4 - 4*b*c^2*d^2*x^2
 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^9 - x^7), -1/84*(12*(b*
c^9*d^2*x^9 - b*c^7*d^2*x^7)*sqrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2
*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) - (18*b*c^5
*d^2*x^5 - (18*b*c^5 - 9*b*c^3 + 2*b*c)*d^2*x^7 - 9*b*c^3*d^2*x^3 + 2*b*c*d
^2*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 12*(a*c^8*d^2*x^8 - 4*a*c^6
*d^2*x^6 + 6*a*c^4*d^2*x^4 - 4*a*c^2*d^2*x^2 + a*d^2 + (b*c^8*d^2*x^8 - 4*b
```

```
*c^6*d^2*x^6 + 6*b*c^4*d^2*x^4 - 4*b*c^2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt
(-c^2*d*x^2 + d))/(c^2*x^9 - x^7)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^8}\,dx = \text{Timed out}$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**8,x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.01

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^8}\,dx = \frac{\left(6\,(-1)^{-2\,c^2dx^2+2\,d}\,c^6d^{\frac{7}{2}}\log\left(-2\,c^2d+\frac{2\,d}{x^2}\right)+6\,c^6d^{\frac{7}{2}}\log\left(x^2-\frac{1}{c^2}\right)-\right.}{8} - \frac{(-c^2dx^2+d)^{\frac{7}{2}}b\arcsin(cx)}{7\,dx^7} - \frac{(-c^2dx^2+d)^{\frac{7}{2}}a}{7\,dx^7}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="maxima")
[Out] 1/84*(6*(-1)^(-2*c^2*d*x^2 + 2*d)*c^6*d^(7/2)*log(-2*c^2*d + 2*d/x^2) + 6*c
^6*d^(7/2)*log(x^2 - 1/c^2) - 11*sqrt(c^4*d*x^4 - 2*c^2*d*x^2 + d)*c^4*d^3/
x^2 + 7*sqrt(c^4*d*x^4 - 2*c^2*d*x^2 + d)*c^2*d^3/x^4 - 2*sqrt(c^4*d*x^4 -
2*c^2*d*x^2 + d)*d^3/x^6)*b*c/d - 1/7*(-c^2*d*x^2 + d)^(7/2)*b*arcsin(c*x)/
(d*x^7) - 1/7*(-c^2*d*x^2 + d)^(7/2)*a/(d*x^7)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^8}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^8,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^8}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}}{x^8}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^8,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^8, x)
```

3.91 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{10}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 282

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{10}}\,dx = -\frac{bc^3d^2\sqrt{d-c^2dx^2}}{189x^6\sqrt{1-c^2x^2}}+\frac{bc^5d^2\sqrt{d-c^2dx^2}}{42x^4\sqrt{1-c^2x^2}} -\frac{bc^7d^2\sqrt{d-c^2dx^2}}{21x^2\sqrt{1-c^2x^2}}-\frac{bcd^2(1-c^2x^2)^{7/2}\sqrt{d-c^2dx^2}}{72x^8}-\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{9dx^9} -\frac{2c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{63dx^7}-\frac{2bc^9d^2\sqrt{d-c^2dx^2}\log(x)}{63\sqrt{1-c^2x^2}}$$

```
[Out] -1/9*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/d/x^9-2/63*c^2*(-c^2*d*x^2+d)^(
7/2)*(a+b*arcsin(c*x))/d/x^7-1/72*b*c*d^2*(-c^2*x^2+1)^(7/2)*(-c^2*d*x^2+d)
^(1/2)/x^8-1/189*b*c^3*d^2*(-c^2*d*x^2+d)^(1/2)/x^6/(-c^2*x^2+1)^(1/2)+1/42
*b*c^5*d^2*(-c^2*d*x^2+d)^(1/2)/x^4/(-c^2*x^2+1)^(1/2)-1/21*b*c^7*d^2*(-c^2
*d*x^2+d)^(1/2)/x^2/(-c^2*x^2+1)^(1/2)-2/63*b*c^9*d^2*ln(x)*(-c^2*d*x^2+d)^
(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 282, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {277, 270, 4779, 12, 457, 79, 45}

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{10}}\,dx = -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{9dx^9} -\frac{2c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{63dx^7}-\frac{bcd^2(1-c^2x^2)^{7/2}\sqrt{d-c^2dx^2}}{72x^8} -\frac{2bc^9d^2\log(x)\sqrt{d-c^2dx^2}}{63\sqrt{1-c^2x^2}}-\frac{bc^7d^2\sqrt{d-c^2dx^2}}{21x^2\sqrt{1-c^2x^2}}+\frac{bc^5d^2\sqrt{d-c^2dx^2}}{42x^4\sqrt{1-c^2x^2}}-\frac{bc^3d^2\sqrt{d-c^2dx^2}}{189x^6\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^10,x]
```

```
[Out] -1/189*(b*c^3*d^2*Sqrt[d - c^2*d*x^2])/(x^6*Sqrt[1 - c^2*x^2]) + (b*c^5*d^2
*Sqrt[d - c^2*d*x^2])/(42*x^4*Sqrt[1 - c^2*x^2]) - (b*c^7*d^2*Sqrt[d - c^2*
d*x^2])/(21*x^2*Sqrt[1 - c^2*x^2]) - (b*c*d^2*(1 - c^2*x^2)^(7/2)*Sqrt[d -
c^2*d*x^2])/(72*x^8) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(9*d*x^9
) - (2*c^2*(d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(63*d*x^7) - (2*b*c^9
*d^2*Sqrt[d - c^2*d*x^2]*Log[x])/(63*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(-(b*e - a*f))*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/
(f*(p + 1)*(c*f - d*e))), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c
*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x]
, x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || I
ntegerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))
))
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
```

```
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{9dx^9} - \frac{2c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{63dx^7} \\
&\quad - \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int \frac{d^2(-7-2c^2x^2)(1-c^2x^2)^3}{63x^9}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{9dx^9} - \frac{2c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{63dx^7} \\
&\quad - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int \frac{(-7-2c^2x^2)(1-c^2x^2)^3}{x^9}\,dx}{63\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{9dx^9} - \frac{2c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{63dx^7} \\
&\quad - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{(-7-2c^2x)(1-c^2x)^3}{x^5}\,dx, x, x^2\right)}{126\sqrt{1-c^2x^2}} \\
&= -\frac{bcd^2(1-c^2x^2)^{7/2}\sqrt{d-c^2dx^2}}{72x^8} - \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{9dx^9} \\
&\quad - \frac{2c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{63dx^7} \\
&\quad + \frac{\left(bc^3d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{(1-c^2x)^3}{x^4}\,dx, x, x^2\right)}{63\sqrt{1-c^2x^2}} \\
&= -\frac{bcd^2(1-c^2x^2)^{7/2}\sqrt{d-c^2dx^2}}{72x^8} - \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{9dx^9} \\
&\quad - \frac{2c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{63dx^7} \\
&\quad + \frac{\left(bc^3d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \left(\frac{1}{x^4}-\frac{3c^2}{x^3}+\frac{3c^4}{x^2}-\frac{c^6}{x}\right)dx, x, x^2\right)}{63\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{bc^3d^2\sqrt{d-c^2dx^2}}{189x^6\sqrt{1-c^2x^2}} + \frac{bc^5d^2\sqrt{d-c^2dx^2}}{42x^4\sqrt{1-c^2x^2}} - \frac{bc^7d^2\sqrt{d-c^2dx^2}}{21x^2\sqrt{1-c^2x^2}} - \frac{bcd^2(1-c^2x^2)^{7/2}\sqrt{d-c^2dx^2}}{72x^8} - \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{9dx^9} - \frac{2c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{63dx^7} - \frac{2bc^9d^2\sqrt{d-c^2dx^2}\log(x)}{63\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.31 (sec) , antiderivative size = 232, normalized size of antiderivative = 0.82

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{10}}\,dx = \frac{d^2\sqrt{d-c^2dx^2}\left(-735bcx+2660bc^3x^3-3150bc^5x^5+420bc^7x^7+456\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^10,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(-735*b*c*x + 2660*b*c^3*x^3 - 3150*b*c^5*x^5 + 42
0*b*c^7*x^7 + 4566*b*c^9*x^9 - 5880*a*Sqrt[1 - c^2*x^2] + 15960*a*c^2*x^2*S
qrt[1 - c^2*x^2] - 12600*a*c^4*x^4*Sqrt[1 - c^2*x^2] + 840*a*c^6*x^6*Sqrt[1
 - c^2*x^2] + 1680*a*c^8*x^8*Sqrt[1 - c^2*x^2] - 840*b*(1 - c^2*x^2)^(7/2)*
(7 + 2*c^2*x^2)*ArcSin[c*x] - 1680*b*c^9*x^9*Log[x]))/(52920*x^9*Sqrt[1 - c
^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.32 (sec) , antiderivative size = 5324, normalized size of antiderivative = 18.88

method	result	size
default	Expression too large to display	5324
parts	Expression too large to display	5324

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^10,x,method=_RETURNVERBOSE)
```

```
[Out] result too large to display
```

Fricas [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 747, normalized size of antiderivative = 2.65

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{10}}\,dx = \left[\frac{24\,(bc^{11}d^2x^{11}-bc^9d^2x^9)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+}}{c^2x^4-x^2}\right.}{}\right.$$

$$-\frac{48\,(bc^{11}d^2x^{11}-bc^9d^2x^9)\sqrt{-d}\arctan\left(\frac{\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}(x^2+1)\sqrt{-d}}{c^2dx^4-(c^2+1)dx^2+d}\right)+(12\,bc^7d^2x^7-90\,bc^5d^2x^5-(12\,bc^7-}{}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="fricas"
)
```

```
[Out] [1/1512*(24*(b*c^11*d^2*x^11 - b*c^9*d^2*x^9)*sqrt(d)*log((c^2*d*x^6 + c^2*
d*x^2 - d*x^4 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) -
 d)/(c^2*x^4 - x^2)) - (12*b*c^7*d^2*x^7 - 90*b*c^5*d^2*x^5 - (12*b*c^7 - 9
0*b*c^5 + 76*b*c^3 - 21*b*c)*d^2*x^9 + 76*b*c^3*d^2*x^3 - 21*b*c*d^2*x)*sqr
t(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 24*(2*a*c^10*d^2*x^10 - a*c^8*d^2*x^
8 - 16*a*c^6*d^2*x^6 + 34*a*c^4*d^2*x^4 - 26*a*c^2*d^2*x^2 + 7*a*d^2 + (2*b
*c^10*d^2*x^10 - b*c^8*d^2*x^8 - 16*b*c^6*d^2*x^6 + 34*b*c^4*d^2*x^4 - 26*b
*c^2*d^2*x^2 + 7*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^11 - x^9)
, -1/1512*(48*(b*c^11*d^2*x^11 - b*c^9*d^2*x^9)*sqrt(-d)*arctan(sqrt(-c^2*d
*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^
2 + d)) + (12*b*c^7*d^2*x^7 - 90*b*c^5*d^2*x^5 - (12*b*c^7 - 90*b*c^5 + 76*
b*c^3 - 21*b*c)*d^2*x^9 + 76*b*c^3*d^2*x^3 - 21*b*c*d^2*x)*sqrt(-c^2*d*x^2
+ d)*sqrt(-c^2*x^2 + 1) - 24*(2*a*c^10*d^2*x^10 - a*c^8*d^2*x^8 - 16*a*c^6*
d^2*x^6 + 34*a*c^4*d^2*x^4 - 26*a*c^2*d^2*x^2 + 7*a*d^2 + (2*b*c^10*d^2*x^1
0 - b*c^8*d^2*x^8 - 16*b*c^6*d^2*x^6 + 34*b*c^4*d^2*x^4 - 26*b*c^2*d^2*x^2
+ 7*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^2*x^11 - x^9)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{10}}\,dx = \text{Timed out}$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**10,x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 162, normalized size of antiderivative = 0.57

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^{10}}\,dx =$$
$$-\frac{1}{1512}\left(48\,c^8d^{\frac{5}{2}}\log\left(x\right)-\frac{12\,c^6d^{\frac{5}{2}}x^6-90\,c^4d^{\frac{5}{2}}x^4+76\,c^2d^{\frac{5}{2}}x^2-21\,d^{\frac{5}{2}}}{x^8}\right)bc$$
$$-\frac{1}{63}\,b\left(\frac{2\left(-c^2dx^2+d\right)^{\frac{7}{2}}c^2}{dx^7}+\frac{7\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{dx^9}\right)\arcsin\left(cx\right)$$
$$-\frac{1}{63}\,a\left(\frac{2\left(-c^2dx^2+d\right)^{\frac{7}{2}}c^2}{dx^7}+\frac{7\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{dx^9}\right)$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="maxima"
)
```

```
[Out] -1/1512*(48*c^8*d^(5/2)*log(x) - (12*c^6*d^(5/2)*x^6 - 90*c^4*d^(5/2)*x^4 +
 76*c^2*d^(5/2)*x^2 - 21*d^(5/2))/x^8)*b*c - 1/63*b*(2*(-c^2*d*x^2 + d)^(7/
2)*c^2/(d*x^7) + 7*(-c^2*d*x^2 + d)^(7/2)/(d*x^9))*arcsin(c*x) - 1/63*a*(2*
(-c^2*d*x^2 + d)^(7/2)*c^2/(d*x^7) + 7*(-c^2*d*x^2 + d)^(7/2)/(d*x^9))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^{10}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^10,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^{10}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}}{x^{10}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^10,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^10, x)
```

3.92 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{12}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 361

$$\begin{aligned}\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{12}}\,dx &= -\frac{bcd^2\sqrt{d-c^2dx^2}}{110x^{10}\sqrt{1-c^2x^2}}+\frac{23bc^3d^2\sqrt{d-c^2dx^2}}{792x^8\sqrt{1-c^2x^2}}\\&-\frac{113bc^5d^2\sqrt{d-c^2dx^2}}{4158x^6\sqrt{1-c^2x^2}}+\frac{bc^7d^2\sqrt{d-c^2dx^2}}{924x^4\sqrt{1-c^2x^2}}+\frac{2bc^9d^2\sqrt{d-c^2dx^2}}{693x^2\sqrt{1-c^2x^2}}\\&-\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{11dx^{11}}-\frac{4c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{99dx^9}\\&-\frac{8c^4(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{693dx^7}-\frac{8bc^{11}d^2\sqrt{d-c^2dx^2}\log(x)}{693\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] -1/11*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/d/x^11-4/99*c^2*(-c^2*d*x^2+d)
^(7/2)*(a+b*arcsin(c*x))/d/x^9-8/693*c^4*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c
*x))/d/x^7-1/110*b*c*d^2*(-c^2*d*x^2+d)^(1/2)/x^10/(-c^2*x^2+1)^(1/2)+23/79
2*b*c^3*d^2*(-c^2*d*x^2+d)^(1/2)/x^8/(-c^2*x^2+1)^(1/2)-113/4158*b*c^5*d^2*
(-c^2*d*x^2+d)^(1/2)/x^6/(-c^2*x^2+1)^(1/2)+1/924*b*c^7*d^2*(-c^2*d*x^2+d)^
(1/2)/x^4/(-c^2*x^2+1)^(1/2)+2/693*b*c^9*d^2*(-c^2*d*x^2+d)^(1/2)/x^2/(-c^2
*x^2+1)^(1/2)-8/693*b*c^11*d^2*ln(x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2
)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 361, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {277, 270, 4779, 12, 1265, 907}

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{12}}\,dx = -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{11dx^{11}} - \frac{4c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{99dx^9} - \frac{8c^4(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{693dx^7} - \frac{bcd^2\sqrt{d-c^2dx^2}}{110x^{10}\sqrt{1-c^2x^2}} - \frac{8bc^{11}d^2\log(x)\sqrt{d-c^2dx^2}}{693\sqrt{1-c^2x^2}} + \frac{2bc^9d^2\sqrt{d-c^2dx^2}}{693x^2\sqrt{1-c^2x^2}} + \frac{bc^7d^2\sqrt{d-c^2dx^2}}{924x^4\sqrt{1-c^2x^2}} - \frac{113bc^5d^2\sqrt{d-c^2dx^2}}{4158x^6\sqrt{1-c^2x^2}} + \frac{23bc^3d^2\sqrt{d-c^2dx^2}}{792x^8\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^12,x]
```

```
[Out] -1/110*(b*c*d^2*Sqrt[d - c^2*d*x^2])/(x^10*Sqrt[1 - c^2*x^2]) + (23*b*c^3*d
^2*Sqrt[d - c^2*d*x^2])/(792*x^8*Sqrt[1 - c^2*x^2]) - (113*b*c^5*d^2*Sqrt[d
 - c^2*d*x^2])/(4158*x^6*Sqrt[1 - c^2*x^2]) + (b*c^7*d^2*Sqrt[d - c^2*d*x^2
])/(924*x^4*Sqrt[1 - c^2*x^2]) + (2*b*c^9*d^2*Sqrt[d - c^2*d*x^2])/(693*x^2
*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(11*d*x^1
1) - (4*c^2*(d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(99*d*x^9) - (8*c^4*
(d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(693*d*x^7) - (8*b*c^11*d^2*Sqrt
[d - c^2*d*x^2]*Log[x])/(693*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{11dx^{11}}-\frac{4c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{99dx^9} \\
&\quad -\frac{8c^4(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{693dx^7} \\
&\quad -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{d^2(1-c^2x^2)^3(-63-28c^2x^2-8c^4x^4)}{693x^{11}}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{11dx^{11}}-\frac{4c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{99dx^9} \\
&\quad -\frac{8c^4(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{693dx^7}-\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\frac{(1-c^2x^2)^3(-63-28c^2x^2-8c^4x^4)}{x^{11}}\,dx}{693\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{11dx^{11}}-\frac{4c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{99dx^9} \\
&\quad -\frac{8c^4(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{693dx^7} \\
&\quad -\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{(1-c^2x)^3(-63-28c^2x-8c^4x^2)}{x^6}\,dx,x,x^2\right)}{1386\sqrt{1-c^2x^2}}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{11dx^{11}} - \frac{4c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{99dx^9} \\
&\quad - \frac{8c^4(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{693dx^7} \\
&\quad - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(-\frac{63}{x^6}+\frac{161c^2}{x^5}-\frac{113c^4}{x^4}+\frac{3c^6}{x^3}+\frac{4c^8}{x^2}+\frac{8c^{10}}{x}\right)dx,x,x^2\right)}{1386\sqrt{1-c^2x^2}} \\
&= -\frac{bcd^2\sqrt{d-c^2dx^2}}{110x^{10}\sqrt{1-c^2x^2}} + \frac{23bc^3d^2\sqrt{d-c^2dx^2}}{792x^8\sqrt{1-c^2x^2}} \\
&\quad - \frac{113bc^5d^2\sqrt{d-c^2dx^2}}{4158x^6\sqrt{1-c^2x^2}} + \frac{bc^7d^2\sqrt{d-c^2dx^2}}{924x^4\sqrt{1-c^2x^2}} + \frac{2bc^9d^2\sqrt{d-c^2dx^2}}{693x^2\sqrt{1-c^2x^2}} \\
&\quad - \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{11dx^{11}} - \frac{4c^2(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{99dx^9} \\
&\quad - \frac{8c^4(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{693dx^7} - \frac{8bc^{11}d^2\sqrt{d-c^2dx^2}\log(x)}{693\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 272, normalized size of antiderivative = 0.75

$$
\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{12}}\,dx = \frac{d^2\sqrt{d-c^2dx^2}\left(-15876bcx+50715bc^3x^3-47460bc^5x^5+1890bc^7x\right.}{}
$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^12,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(-15876*b*c*x + 50715*b*c^3*x^3 - 47460*b*c^5*x^5
+ 1890*b*c^7*x^7 + 5040*b*c^9*x^9 + 59048*b*c^11*x^11 - 158760*a*Sqrt[1 - c
^2*x^2] + 405720*a*c^2*x^2*Sqrt[1 - c^2*x^2] - 284760*a*c^4*x^4*Sqrt[1 - c^
2*x^2] + 7560*a*c^6*x^6*Sqrt[1 - c^2*x^2] + 10080*a*c^8*x^8*Sqrt[1 - c^2*x^
2] + 20160*a*c^10*x^10*Sqrt[1 - c^2*x^2] - 2520*b*(1 - c^2*x^2)^(7/2)*(63 +
 28*c^2*x^2 + 8*c^4*x^4)*ArcSin[c*x] - 20160*b*c^11*x^11*Log[x]))/(1746360*
x^11*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.42 (sec) , antiderivative size = 6761, normalized size of antiderivative = 18.73

method	result	size
default	Expression too large to display	6761
parts	Expression too large to display	6761

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^12,x,method=_RETURNVERBOSE)
```

```
[Out] result too large to display
```

Fricas [A] (verification not implemented)

none

Time = 0.36 (sec) , antiderivative size = 831, normalized size of antiderivative = 2.30

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{12}}\,dx = \left[\frac{480\,(bc^{13}d^2x^{13}-bc^{11}d^2x^{11})\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4+\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2}}{c^2x^4-x^2}\right.}{}\right.$$

$$-\frac{960\,(bc^{13}d^2x^{13}-bc^{11}d^2x^{11})\sqrt{-d}\arctan\left(\frac{\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\,(x^2+1)\sqrt{-d}}{c^2dx^4-(c^2+1)dx^2+d}\right)+(240\,bc^9d^2x^9+90\,bc^7d^2x^7-(240\,b}{}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="fricas"
)
```

```
[Out] [1/83160*(480*(b*c^13*d^2*x^13 - b*c^11*d^2*x^11)*sqrt(d)*log((c^2*d*x^6 +
c^2*d*x^2 - d*x^4 + sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(
d) - d)/(c^2*x^4 - x^2)) - (240*b*c^9*d^2*x^9 + 90*b*c^7*d^2*x^7 - (240*b*c
^9 + 90*b*c^7 - 2260*b*c^5 + 2415*b*c^3 - 756*b*c)*d^2*x^11 - 2260*b*c^5*d^
2*x^5 + 2415*b*c^3*d^2*x^3 - 756*b*c*d^2*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*
x^2 + 1) + 120*(8*a*c^12*d^2*x^12 - 4*a*c^10*d^2*x^10 - a*c^8*d^2*x^8 - 116
*a*c^6*d^2*x^6 + 274*a*c^4*d^2*x^4 - 224*a*c^2*d^2*x^2 + 63*a*d^2 + (8*b*c^
12*d^2*x^12 - 4*b*c^10*d^2*x^10 - b*c^8*d^2*x^8 - 116*b*c^6*d^2*x^6 + 274*b
*c^4*d^2*x^4 - 224*b*c^2*d^2*x^2 + 63*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 +
 d))/(c^2*x^13 - x^11), -1/83160*(960*(b*c^13*d^2*x^13 - b*c^11*d^2*x^11)*s
qrt(-d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(
c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) + (240*b*c^9*d^2*x^9 + 90*b*c^7*d^2*x^7 -
 (240*b*c^9 + 90*b*c^7 - 2260*b*c^5 + 2415*b*c^3 - 756*b*c)*d^2*x^11 - 2260
*b*c^5*d^2*x^5 + 2415*b*c^3*d^2*x^3 - 756*b*c*d^2*x)*sqrt(-c^2*d*x^2 + d)*s
qrt(-c^2*x^2 + 1) - 120*(8*a*c^12*d^2*x^12 - 4*a*c^10*d^2*x^10 - a*c^8*d^2*
x^8 - 116*a*c^6*d^2*x^6 + 274*a*c^4*d^2*x^4 - 224*a*c^2*d^2*x^2 + 63*a*d^2
+ (8*b*c^12*d^2*x^12 - 4*b*c^10*d^2*x^10 - b*c^8*d^2*x^8 - 116*b*c^6*d^2*x^
6 + 274*b*c^4*d^2*x^4 - 224*b*c^2*d^2*x^2 + 63*b*d^2)*arcsin(c*x))*sqrt(-c^
2*d*x^2 + d))/(c^2*x^13 - x^11)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{12}}\,dx = \text{Timed out}$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**12,x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 221, normalized size of antiderivative = 0.61

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{12}}\,dx = -\frac{1}{83160}\left(960\,c^{10}d^{\frac{5}{2}}\log(x) - \frac{240\,c^8d^{\frac{5}{2}}x^8 + 90\,c^6d^{\frac{5}{2}}x^6 - 2260\,c^4d^{\frac{5}{2}}x^4 + 2415\,c^2d^{\frac{5}{2}}x^2 - 756\,d^{\frac{5}{2}}}{x^{10}}\right)bc - \frac{1}{693}\,b\left(\frac{8\,(-c^2dx^2+d)^{\frac{7}{2}}c^4}{dx^7} + \frac{28\,(-c^2dx^2+d)^{\frac{7}{2}}c^2}{dx^9} + \frac{63\,(-c^2dx^2+d)^{\frac{7}{2}}}{dx^{11}}\right)\arcsin(cx) - \frac{1}{693}\,a\left(\frac{8\,(-c^2dx^2+d)^{\frac{7}{2}}c^4}{dx^7} + \frac{28\,(-c^2dx^2+d)^{\frac{7}{2}}c^2}{dx^9} + \frac{63\,(-c^2dx^2+d)^{\frac{7}{2}}}{dx^{11}}\right)$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="maxima"
)
[Out] -1/83160*(960*c^10*d^(5/2)*log(x) - (240*c^8*d^(5/2)*x^8 + 90*c^6*d^(5/2)*x
^6 - 2260*c^4*d^(5/2)*x^4 + 2415*c^2*d^(5/2)*x^2 - 756*d^(5/2))/x^10)*b*c -
 1/693*b*(8*(-c^2*d*x^2 + d)^(7/2)*c^4/(d*x^7) + 28*(-c^2*d*x^2 + d)^(7/2)*
c^2/(d*x^9) + 63*(-c^2*d*x^2 + d)^(7/2)/(d*x^11))*arcsin(c*x) - 1/693*a*(8*
(-c^2*d*x^2 + d)^(7/2)*c^4/(d*x^7) + 28*(-c^2*d*x^2 + d)^(7/2)*c^2/(d*x^9)
+ 63*(-c^2*d*x^2 + d)^(7/2)/(d*x^11))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{12}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^12,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^{12}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)^{5/2}}{x^{12}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^12,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^12, x)
```

3.93 $\int x^5(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 354

$$\begin{aligned}\int x^5(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx &= \frac{8bd^2x\sqrt{d-c^2dx^2}}{693c^5\sqrt{1-c^2x^2}} \\ &+ \frac{4bd^2x^3\sqrt{d-c^2dx^2}}{2079c^3\sqrt{1-c^2x^2}} + \frac{bd^2x^5\sqrt{d-c^2dx^2}}{1155c\sqrt{1-c^2x^2}} - \frac{113bcd^2x^7\sqrt{d-c^2dx^2}}{4851\sqrt{1-c^2x^2}} \\ &+ \frac{23bc^3d^2x^9\sqrt{d-c^2dx^2}}{891\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^{11}\sqrt{d-c^2dx^2}}{121\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^6d} \\ &+ \frac{2(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{9c^6d^2} - \frac{(d-c^2dx^2)^{11/2}(a+b\arcsin(cx))}{11c^6d^3}\end{aligned}$$

```
[Out] -1/7*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/c^6/d+2/9*(-c^2*d*x^2+d)^(9/2)*
(a+b*arcsin(c*x))/c^6/d^2-1/11*(-c^2*d*x^2+d)^(11/2)*(a+b*arcsin(c*x))/c^6/
d^3+8/693*b*d^2*x*(-c^2*d*x^2+d)^(1/2)/c^5/(-c^2*x^2+1)^(1/2)+4/2079*b*d^2*
x^3*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/1155*b*d^2*x^5*(-c^2*d*x^
2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-113/4851*b*c*d^2*x^7*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)+23/891*b*c^3*d^2*x^9*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1
/2)-1/121*b*c^5*d^2*x^11*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 354, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {272, 45, 4779, 12, 1167}

$$\int x^5\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=-\frac{\left(d-c^2dx^2\right)^{11/2}(a+b\arcsin(cx))}{11c^6d^3}+\frac{2\left(d-c^2dx^2\right)^{9/2}(a+b\arcsin(cx))}{9c^6d^2}-\frac{\left(d-c^2dx^2\right)^{7/2}(a+b\arcsin(cx))}{7c^6d}-\frac{113bcd^2x^7\sqrt{d-c^2dx^2}}{4851\sqrt{1-c^2x^2}}+\frac{bd^2x^5\sqrt{d-c^2dx^2}}{1155c\sqrt{1-c^2x^2}}+\frac{8bd^2x\sqrt{d-c^2dx^2}}{693c^5\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^{11}\sqrt{d-c^2dx^2}}{121\sqrt{1-c^2x^2}}+\frac{23bc^3d^2x^9\sqrt{d-c^2dx^2}}{891\sqrt{1-c^2x^2}}+\frac{4bd^2x^3\sqrt{d-c^2dx^2}}{2079c^3\sqrt{1-c^2x^2}}$$

```
[In] Int[x^5*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (8*b*d^2*x*Sqrt[d - c^2*d*x^2])/(693*c^5*Sqrt[1 - c^2*x^2]) + (4*b*d^2*x^3*
Sqrt[d - c^2*d*x^2])/(2079*c^3*Sqrt[1 - c^2*x^2]) + (b*d^2*x^5*Sqrt[d - c^2
*d*x^2])/(1155*c*Sqrt[1 - c^2*x^2]) - (113*b*c*d^2*x^7*Sqrt[d - c^2*d*x^2])
/(4851*Sqrt[1 - c^2*x^2]) + (23*b*c^3*d^2*x^9*Sqrt[d - c^2*d*x^2])/(891*Sqr
t[1 - c^2*x^2]) - (b*c^5*d^2*x^11*Sqrt[d - c^2*d*x^2])/(121*Sqrt[1 - c^2*x^
2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^6*d) + (2*(d - c^2*d
*x^2)^(9/2)*(a + b*ArcSin[c*x]))/(9*c^6*d^2) - ((d - c^2*d*x^2)^(11/2)*(a +
 b*ArcSin[c*x]))/(11*c^6*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^6d}+\frac{2(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{9c^6d^2} \\
&\quad -\frac{(d-c^2dx^2)^{11/2}(a+b\arcsin(cx))}{11c^6d^3} \\
&\quad -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{d^2(1-c^2x^2)^3(-8-28c^2x^2-63c^4x^4)}{693c^6}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^6d}+\frac{2(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{9c^6d^2} \\
&\quad -\frac{(d-c^2dx^2)^{11/2}(a+b\arcsin(cx))}{11c^6d^3} \\
&\quad -\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)^3(-8-28c^2x^2-63c^4x^4)\,dx}{693c^5\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^6d}+\frac{2(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{9c^6d^2} \\
&\quad -\frac{(d-c^2dx^2)^{11/2}(a+b\arcsin(cx))}{11c^6d^3} \\
&\quad -\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int(-8-4c^2x^2-3c^4x^4+113c^6x^6-161c^8x^8+63c^{10}x^{10})\,dx}{693c^5\sqrt{1-c^2x^2}} \\
&= \frac{8bd^2x\sqrt{d-c^2dx^2}}{693c^5\sqrt{1-c^2x^2}}+\frac{4bd^2x^3\sqrt{d-c^2dx^2}}{2079c^3\sqrt{1-c^2x^2}}+\frac{bd^2x^5\sqrt{d-c^2dx^2}}{1155c\sqrt{1-c^2x^2}}-\frac{113bcd^2x^7\sqrt{d-c^2dx^2}}{4851\sqrt{1-c^2x^2}} \\
&\quad +\frac{23bc^3d^2x^9\sqrt{d-c^2dx^2}}{891\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^{11}\sqrt{d-c^2dx^2}}{121\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^6d} \\
&\quad +\frac{2(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{9c^6d^2}-\frac{(d-c^2dx^2)^{11/2}(a+b\arcsin(cx))}{11c^6d^3}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 160, normalized size of antiderivative = 0.45

$$\int x^5 \left(d-c^2 d x^2\right)^{5/2} (a+b \arcsin (c x)) \, dx =$$
$$-\frac{d^2\sqrt{d-c^2dx^2}\Big(3465a(1-c^2x^2)^{7/2}\left(8+28c^2x^2+63c^4x^4\right)+bcx(-27720-4620c^2x^2-2079c^4x^4+55935c^6x}{2401245c^6\sqrt{1-c^2x^2}}$$

```
[In] Integrate[x^5*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/2401245*(d^2*Sqrt[d - c^2*d*x^2]*(3465*a*(1 - c^2*x^2)^(7/2)*(8 + 28*c^2
*x^2 + 63*c^4*x^4) + b*c*x*(-27720 - 4620*c^2*x^2 - 2079*c^4*x^4 + 55935*c^
6*x^6 - 61985*c^8*x^8 + 19845*c^10*x^10) + 3465*b*(1 - c^2*x^2)^(7/2)*(8 +
28*c^2*x^2 + 63*c^4*x^4)*ArcSin[c*x]))/(c^6*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.31 (sec) , antiderivative size = 1644, normalized size of antiderivative = 4.64

method	result	size
default	Expression too large to display	1644
parts	Expression too large to display	1644

```
[In] int(x^5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/11*x^4*(-c^2*d*x^2+d)^(7/2)/c^2/d+4/11/c^2*(-1/9*x^2*(-c^2*d*x^2+d)^(
7/2)/c^2/d-2/63/d/c^4*(-c^2*d*x^2+d)^(7/2)))+b*(1/247808*(-d*(c^2*x^2-1))^(
1/2)*(1+11*I*(-c^2*x^2+1)^(1/2)*x*c+1024*c^12*x^12+2816*I*(-c^2*x^2+1)^(1/2
)*x^9*c^9-61*c^2*x^2-2352*c^6*x^6+620*c^4*x^4-2816*I*(-c^2*x^2+1)^(1/2)*x^7
*c^7-3328*c^10*x^10+4096*c^8*x^8+1232*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-1024*I*(
-c^2*x^2+1)^(1/2)*x^11*c^11-220*I*(-c^2*x^2+1)^(1/2)*x^3*c^3)*(I+11*arcsin(
c*x))*d^2/c^6/(c^2*x^2-1)-1/165888*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-70
4*c^8*x^8-256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(
1/2)*x^7*c^7-280*c^4*x^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*
(-c^2*x^2+1)^(1/2)*x^3*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+9*arcsin(c*x))*
d^2/c^6/(c^2*x^2-1)-5/100352*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6
-64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c
^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)
*(I+7*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)+5/9216*(-d*(c^2*x^2-1))^(1/2)*(4*c^4
*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)
*(I+3*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)-5/1024*(-d*(c^2*x^2-1))^(1/2)*(c^2*x
^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d^2/c^6/(c^2*x^2-1)-5/1024*(
```

```
-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*
d^2/c^6/(c^2*x^2-1)+5/9216*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)
^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))
*d^2/c^6/(c^2*x^2-1)+1/10240*(-d*(c^2*x^2-1))^(1/2)*(16*I*c^5*x^5*(-c^2*x^2
+1)^(1/2)+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x
^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-I+5*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)-1/1658
88*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+256*c^10*x^10-5
76*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*x^2+1)^(1/2)*x^5*c^
5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x^4+9*I*(-c^2*x^2+1)
^(1/2)*x*c+41*c^2*x^2-1)*(-I+9*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)+1/247808*(-
d*(c^2*x^2-1))^(1/2)*(1024*I*(-c^2*x^2+1)^(1/2)*x^11*c^11+1024*c^12*x^12-28
16*I*(-c^2*x^2+1)^(1/2)*x^9*c^9-3328*c^10*x^10+2816*I*(-c^2*x^2+1)^(1/2)*x^
7*c^7+4096*c^8*x^8-1232*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-2352*c^6*x^6+220*I*(-c
^2*x^2+1)^(1/2)*x^3*c^3+620*c^4*x^4-11*I*(-c^2*x^2+1)^(1/2)*c*x-61*c^2*x^2+
1)*(-I+11*arcsin(c*x))*d^2/c^6/(c^2*x^2-1)+3/125440*(-d*(c^2*x^2-1))^(1/2)*
(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(2*I+35*arcsin(c*x))*cos(6*arcsin(c*x)
)*d^2/c^6/(c^2*x^2-1)+1/250880*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*
x^2+1)^(1/2)-I)*(37*I+35*arcsin(c*x))*sin(6*arcsin(c*x))*d^2/c^6/(c^2*x^2-1
))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 291, normalized size of antiderivative = 0.82

$$\int x^5(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx = \frac{(19845\,bc^{11}d^2x^{11}-61985\,bc^9d^2x^9+55935\,bc^7d^2x^7-2079\,bc^5d^2x^5-4620\,bc^3d^2x^3-2772\cdots}{}$$

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/2401245*((19845*b*c^11*d^2*x^11 - 61985*b*c^9*d^2*x^9 + 55935*b*c^7*d^2*x
^7 - 2079*b*c^5*d^2*x^5 - 4620*b*c^3*d^2*x^3 - 27720*b*c*d^2*x)*sqrt(-c^2*d
*x^2 + d)*sqrt(-c^2*x^2 + 1) + 3465*(63*a*c^12*d^2*x^12 - 224*a*c^10*d^2*x^
10 + 274*a*c^8*d^2*x^8 - 116*a*c^6*d^2*x^6 - a*c^4*d^2*x^4 - 4*a*c^2*d^2*x^
2 + 8*a*d^2 + (63*b*c^12*d^2*x^12 - 224*b*c^10*d^2*x^10 + 274*b*c^8*d^2*x^8
 - 116*b*c^6*d^2*x^6 - b*c^4*d^2*x^4 - 4*b*c^2*d^2*x^2 + 8*b*d^2)*arcsin(c*
x))*sqrt(-c^2*d*x^2 + d))/(c^8*x^2 - c^6)
```

Sympy [F(-1)]

Timed out.

$$\int x^5 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx=\text{Timed out}$$

```
[In] integrate(x**5*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 219, normalized size of antiderivative = 0.62

$$\int x^5 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = -\frac{1}{693}\left(\frac{63\left(-c^2dx^2+d\right)^{\frac{7}{2}}x^4}{c^2d}+\frac{28\left(-c^2dx^2+d\right)^{\frac{7}{2}}x^2}{c^4d}+\frac{8\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{c^6d}\right)b\arcsin(cx) - \frac{1}{693}\left(\frac{63\left(-c^2dx^2+d\right)^{\frac{7}{2}}x^4}{c^2d}+\frac{28\left(-c^2dx^2+d\right)^{\frac{7}{2}}x^2}{c^4d}+\frac{8\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{c^6d}\right)a - \frac{\left(19845\,c^{10}d^{\frac{5}{2}}x^{11}-61985\,c^8d^{\frac{5}{2}}x^9+55935\,c^6d^{\frac{5}{2}}x^7-2079\,c^4d^{\frac{5}{2}}x^5-4620\,c^2d^{\frac{5}{2}}x^3-27720\,d^{\frac{5}{2}}x\right)b}{2401245\,c^5}$$

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] -1/693*(63*(-c^2*d*x^2 + d)^(7/2)*x^4/(c^2*d) + 28*(-c^2*d*x^2 + d)^(7/2)*x
^2/(c^4*d) + 8*(-c^2*d*x^2 + d)^(7/2)/(c^6*d))*b*arcsin(c*x) - 1/693*(63*(-
c^2*d*x^2 + d)^(7/2)*x^4/(c^2*d) + 28*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^4*d) +
8*(-c^2*d*x^2 + d)^(7/2)/(c^6*d))*a - 1/2401245*(19845*c^10*d^(5/2)*x^11 -
61985*c^8*d^(5/2)*x^9 + 55935*c^6*d^(5/2)*x^7 - 2079*c^4*d^(5/2)*x^5 - 4620
*c^2*d^(5/2)*x^3 - 27720*d^(5/2)*x)*b/c^5
```

Giac [F(-2)]

Exception generated.

$$\int x^5 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(x^5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x^5 (d-c^2dx^2)^{5/2} (a+b\arcsin(cx))\,dx = \int x^5\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int(x^5*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
[Out] int(x^5*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.94 $\int x^3(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 278

$$\int x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\frac{2bd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}+\frac{bd^2x^3\sqrt{d-c^2dx^2}}{189c\sqrt{1-c^2x^2}}-\frac{bcd^2x^5\sqrt{d-c^2dx^2}}{21\sqrt{1-c^2x^2}}+\frac{19bc^3d^2x^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{7/2}(a+b\arcsin(cx))}{7c^4d}+\frac{\left(d-c^2dx^2\right)^{9/2}(a+b\arcsin(cx))}{9c^4d^2}$$

```
[Out] -1/7*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/c^4/d+1/9*(-c^2*d*x^2+d)^(9/2)*
(a+b*arcsin(c*x))/c^4/d^2+2/63*b*d^2*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1
)^(1/2)+1/189*b*d^2*x^3*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/21*b*c*
d^2*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+19/441*b*c^3*d^2*x^7*(-c^2*
d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/81*b*c^5*d^2*x^9*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {272, 45, 4779, 12, 380}

$$\int x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\frac{\left(d-c^2dx^2\right)^{9/2}(a+b\arcsin(cx))}{9c^4d^2}-\frac{\left(d-c^2dx^2\right)^{7/2}(a+b\arcsin(cx))}{7c^4d}-\frac{bcd^2x^5\sqrt{d-c^2dx^2}}{21\sqrt{1-c^2x^2}}+\frac{bd^2x^3\sqrt{d-c^2dx^2}}{189c\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}}+\frac{2bd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}+\frac{19bc^3d^2x^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}}$$

```
[In] Int[x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d^2*x*Sqrt[d - c^2*d*x^2])/(63*c^3*Sqrt[1 - c^2*x^2]) + (b*d^2*x^3*Sqr
t[d - c^2*d*x^2])/(189*c*Sqrt[1 - c^2*x^2]) - (b*c*d^2*x^5*Sqrt[d - c^2*d*x
^2])/(21*Sqrt[1 - c^2*x^2]) + (19*b*c^3*d^2*x^7*Sqrt[d - c^2*d*x^2])/(441*S
qrt[1 - c^2*x^2]) - (b*c^5*d^2*x^9*Sqrt[d - c^2*d*x^2])/(81*Sqrt[1 - c^2*x^
2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^4*d) + ((d - c^2*d*x
^2)^(9/2)*(a + b*ArcSin[c*x]))/(9*c^4*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 380

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\text{integral} = -\frac{\left(d-c^2dx^2\right)^{7/2}(a+b\arcsin(cx))}{7c^4d}+\frac{\left(d-c^2dx^2\right)^{9/2}(a+b\arcsin(cx))}{9c^4d^2} - \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{d^2(-2-7c^2x^2)\left(1-c^2x^2\right)^3}{63c^4}\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^4d} + \frac{(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{9c^4d^2} - \frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int(-2-7c^2x^2)(1-c^2x^2)^3\,dx}{63c^3\sqrt{1-c^2x^2}}$$

$$= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^4d} + \frac{(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{9c^4d^2} - \frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int(-2-c^2x^2+15c^4x^4-19c^6x^6+7c^8x^8)\,dx}{63c^3\sqrt{1-c^2x^2}}$$

$$= \frac{2bd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}} + \frac{bd^2x^3\sqrt{d-c^2dx^2}}{189c\sqrt{1-c^2x^2}} - \frac{bcd^2x^5\sqrt{d-c^2dx^2}}{21\sqrt{1-c^2x^2}} + \frac{19bc^3d^2x^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^4d} + \frac{(d-c^2dx^2)^{9/2}(a+b\arcsin(cx))}{9c^4d^2}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.49

$$\int x^3(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx = \frac{d^2\sqrt{d-c^2dx^2}\Big(-63a(1-c^2x^2)^{7/2}(2+7c^2x^2)+b(126cx+21c^3x^3-189c^5x^5+171c^7x^7-}{3969c^4\sqrt{1-c^2x^2}}$$

```
[In] Integrate[x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(-63*a*(1 - c^2*x^2)^(7/2)*(2 + 7*c^2*x^2) + b*(12
6*c*x + 21*c^3*x^3 - 189*c^5*x^5 + 171*c^7*x^7 - 49*c^9*x^9) - 63*b*(1 - c^
2*x^2)^(7/2)*(2 + 7*c^2*x^2)*ArcSin[c*x]))/(3969*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.25 (sec) , antiderivative size = 1063, normalized size of antiderivative = 3.82

method	result	size
default	Expression too large to display	1063
parts	Expression too large to display	1063

```
[In] int(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/9*x^2*(-c^2*d*x^2+d)^(7/2)/c^2/d-2/63/d/c^4*(-c^2*d*x^2+d)^(7/2))+b*(
1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8*x^8-256*I*(-c^2*x^2+1
)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-280*c^4*x^4-43
2*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-
9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+9*arcsin(c*x))*d^2/c^4/(c^2*x^2-1)-3/25088
*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+1)^(
1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2
+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d^2/c^4/(
c^2*x^2-1)+1/576*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-
c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))*d^2/c^4/(c
^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)
*(arcsin(c*x)+I)*d^2/c^4/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*
x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d^2/c^4/(c^2*x^2-1)+1/576*(-d*(
c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1
)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d^2/c^4/(c^2*x^2-1)-3/25088*(-d
*(c^2*x^2-1))^(1/2)*(64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+64*c^8*x^8-112*I*(-c^2
*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x
^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arcsin(c*x))*d^2/c^4/(c^2
*x^2-1)+1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+25
6*c^10*x^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*x^2+1)
^(1/2)*x^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x^4+9*I
*(-c^2*x^2+1)^(1/2)*x*c+41*c^2*x^2-1)*(-I+9*arcsin(c*x))*d^2/c^4/(c^2*x^2-1
))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 255, normalized size of antiderivative = 0.92

$$\int x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx = \frac{(49\,bc^9d^2x^9 - 171\,bc^7d^2x^7 + 189\,bc^5d^2x^5 - 21\,bc^3d^2x^3 - 126\,bcd^2x)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2}}{}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/3969*((49*b*c^9*d^2*x^9 - 171*b*c^7*d^2*x^7 + 189*b*c^5*d^2*x^5 - 21*b*c^
3*d^2*x^3 - 126*b*c*d^2*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 63*(7*
a*c^10*d^2*x^10 - 26*a*c^8*d^2*x^8 + 34*a*c^6*d^2*x^6 - 16*a*c^4*d^2*x^4 -
a*c^2*d^2*x^2 + 2*a*d^2 + (7*b*c^10*d^2*x^10 - 26*b*c^8*d^2*x^8 + 34*b*c^6*
d^2*x^6 - 16*b*c^4*d^2*x^4 - b*c^2*d^2*x^2 + 2*b*d^2)*arcsin(c*x))*sqrt(-c^
2*d*x^2 + d))/(c^6*x^2 - c^4)
```

Sympy [F(-1)]

Timed out.

$$\int x^3 (d - c^2 d x^2)^{5/2} (a + b \arcsin(cx))\, dx = \text{Timed out}$$

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 160, normalized size of antiderivative = 0.58

$$\begin{aligned}\int x^3 (d - c^2 d x^2)^{5/2} (a + b \arcsin(cx))\, dx = &-\frac{1}{63}\left(\frac{7\,(-c^2dx^2+d)^{\frac{7}{2}}x^2}{c^2d}+\frac{2\,(-c^2dx^2+d)^{\frac{7}{2}}}{c^4d}\right)b\arcsin(cx)\\ &-\frac{1}{63}\left(\frac{7\,(-c^2dx^2+d)^{\frac{7}{2}}x^2}{c^2d}+\frac{2\,(-c^2dx^2+d)^{\frac{7}{2}}}{c^4d}\right)a\\ &-\frac{\left(49\,c^8d^{\frac{5}{2}}x^9-171\,c^6d^{\frac{5}{2}}x^7+189\,c^4d^{\frac{5}{2}}x^5-21\,c^2d^{\frac{5}{2}}x^3-126\,d^{\frac{5}{2}}x\right)b}{3969\,c^3}\end{aligned}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] -1/63*(7*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(7/2)/(c^4
*d))*b*arcsin(c*x) - 1/63*(7*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^2*d) + 2*(-c^2*d
*x^2 + d)^(7/2)/(c^4*d))*a - 1/3969*(49*c^8*d^(5/2)*x^9 - 171*c^6*d^(5/2)*x
^7 + 189*c^4*d^(5/2)*x^5 - 21*c^2*d^(5/2)*x^3 - 126*d^(5/2)*x)*b/c^3
```

Giac [F(-2)]

Exception generated.

$$\int x^3 (d - c^2 d x^2)^{5/2} (a + b \arcsin(cx))\, dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x^3 \left(d - c^2 d x^2\right)^{5/2} (a + b \arcsin(cx))\, dx = \int x^3 \left(a + b\,\mathrm{asin}(c\,x)\right)\, \left(d - c^2\,d\,x^2\right)^{5/2}\, dx$$

```
[In] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
[Out] int(x^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.95 $\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 202

$$\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx=\frac{bd^2x\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}}-\frac{bcd^2x^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}}+\frac{3bc^3d^2x^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^2d}$$

```
[Out] -1/7*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/c^2/d+1/7*b*d^2*x*(-c^2*d*x^2+d
)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/7*b*c*d^2*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2
+1)^(1/2)+3/35*b*c^3*d^2*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/49*b
*c^5*d^2*x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {4767, 200}

$$\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx=-\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^2d}+\frac{bd^2x\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}}-\frac{bcd^2x^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}+\frac{3bc^3d^2x^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}}$$

```
[In] Int[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

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

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^2d}+\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int (1-c^2x^2)^3\,dx}{7c\sqrt{1-c^2x^2}} \\
&= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^2d}+\frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\int (1-3c^2x^2+3c^4x^4-c^6x^6)\,dx}{7c\sqrt{1-c^2x^2}} \\
&= \frac{bd^2x\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}}-\frac{bcd^2x^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}}+\frac{3bc^3d^2x^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}} \\
&\quad -\frac{bc^5d^2x^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))}{7c^2d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.46

$$
\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx=\frac{d^2\sqrt{d-c^2dx^2}\left(\frac{bc\left(x-c^2x^3+\frac{3c^4x^5}{5}-\frac{c^6x^7}{7}\right)}{\sqrt{1-c^2x^2}}+(-1+c^2x^2)^3(a+b\arcsin(cx))\right)}{7c^2}
$$

```
[In] Integrate[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
[Out] (d^2*Sqrt[d - c^2*d*x^2]*((b*c*(x - c^2*x^3 + (3*c^4*x^5)/5 - (c^6*x^7)/7))
/Sqrt[1 - c^2*x^2] + (-1 + c^2*x^2)^3*(a + b*ArcSin[c*x])))/(7*c^2)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.22 (sec) , antiderivative size = 717, normalized size of antiderivative = 3.55

method	result
default	$-\frac{a(-c^2dx^2+d)^{\frac{7}{2}}}{7c^2d}+b\left(\frac{\sqrt{-d(c^2x^2-1)}\,\left(64c^8x^8-144c^6x^6-64ic^7x^7\sqrt{-c^2x^2+1}+104c^4x^4+112i\sqrt{-c^2x^2+1}\,x^5c^5-25c^2x^2-56i\sqrt{-c}\right.}{6272c^2(c^2x^2-1)}\right.$
parts	$-\frac{a(-c^2dx^2+d)^{\frac{7}{2}}}{7c^2d}+b\left(\frac{\sqrt{-d(c^2x^2-1)}\,\left(64c^8x^8-144c^6x^6-64ic^7x^7\sqrt{-c^2x^2+1}+104c^4x^4+112i\sqrt{-c^2x^2+1}\,x^5c^5-25c^2x^2-56i\sqrt{-c}\right.}{6272c^2(c^2x^2-1)}\right.$

```
[In] int(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/7*a*(-c^2*d*x^2+d)^(7/2)/c^2/d+b*(1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*
x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2
+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+
1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1)
)^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d^2/c^2/(c^2*x
^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(ar
csin(c*x)-I)*d^2/c^2/(c^2*x^2-1)+1/128*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*
(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*
arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/7840*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2
+1)^(1/2)*x*c+c^2*x^2-1)*(11*I+70*arcsin(c*x))*cos(6*arcsin(c*x))*d^2/c^2/(
c^2*x^2-1)-3/15680*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)
-I)*(9*I+35*arcsin(c*x))*sin(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/160*(-d*(
c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(I+5*arcsin(c*x))*co
s(4*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/320*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^
2-c*x*(-c^2*x^2+1)^(1/2)-I)*(3*I+5*arcsin(c*x))*sin(4*arcsin(c*x))*d^2/c^2/
(c^2*x^2-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.06

$$\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx = \frac{(5\,bc^7d^2x^7-21\,bc^5d^2x^5+35\,bc^3d^2x^3-35\,bcd^2x)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+35\,(ac^8d^2x^8}{}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/245*((5*b*c^7*d^2*x^7 - 21*b*c^5*d^2*x^5 + 35*b*c^3*d^2*x^3 - 35*b*c*d^2*
x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 35*(a*c^8*d^2*x^8 - 4*a*c^6*d^
```

```
2*x^6 + 6*a*c^4*d^2*x^4 - 4*a*c^2*d^2*x^2 + a*d^2 + (b*c^8*d^2*x^8 - 4*b*c^
6*d^2*x^6 + 6*b*c^4*d^2*x^4 - 4*b*c^2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c
^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F]

$$\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx=\int x(-d(cx-1)(cx+1))^{\frac{5}{2}}(a+b\operatorname{asin}(cx))\;dx$$

```
[In] integrate(x*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
[Out] Integral(x*(-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 98, normalized size of antiderivative = 0.49

$$\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx=-\frac{(-c^2dx^2+d)^{\frac{7}{2}}b\arcsin(cx)}{7\,c^2d}-\frac{(-c^2dx^2+d)^{\frac{7}{2}}a}{7\,c^2d}-\frac{\left(5\,c^6d^{\frac{7}{2}}x^7-21\,c^4d^{\frac{7}{2}}x^5+35\,c^2d^{\frac{7}{2}}x^3-35\,d^{\frac{7}{2}}x\right)b}{245\,cd}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] -1/7*(-c^2*d*x^2 + d)^(7/2)*b*arcsin(c*x)/(c^2*d) - 1/7*(-c^2*d*x^2 + d)^(7
/2)*a/(c^2*d) - 1/245*(5*c^6*d^(7/2)*x^7 - 21*c^4*d^(7/2)*x^5 + 35*c^2*d^(7
/2)*x^3 - 35*d^(7/2)*x)*b/(c*d)
```

Giac [F(-2)]

Exception generated.

$$\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\int x\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
[Out] int(x*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.96 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 361

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x}\,dx = -\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}}$$
$$-\frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{1}{3}d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))$$
$$+\frac{1}{5}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))-\frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{ibd^2\sqrt{d-c^2dx^2}}{\sqrt{}}$$

```
[Out] 1/3*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*
arcsin(c*x))+d^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-23/15*b*c*d^2*x*(-c
^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+11/45*b*c^3*d^2*x^3*(-c^2*d*x^2+d)^(1/
2)/(-c^2*x^2+1)^(1/2)-1/25*b*c^5*d^2*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^
(1/2)-2*d^2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2
+d)^(1/2)/(-c^2*x^2+1)^(1/2)+I*b*d^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(
-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b*d^2*polylog(2,I*c*x+(-c^2*x^2+1)
^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 361, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used

$= \{4787, 4783, 4803, 4268, 2317, 2438, 8, 200\}$

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x}\,dx =$$
$$-\frac{2d^2\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}$$
$$+d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{1}{5}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))$$
$$+\frac{1}{3}d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))+\frac{ibd^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{ibd^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}(2,}{\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (-23*b*c*d^2*x*Sqrt[d - c^2*d*x^2])/(15*Sqrt[1 - c^2*x^2]) + (11*b*c^3*d^2*
x^3*Sqrt[d - c^2*d*x^2])/(45*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^5*Sqrt[d - c
^2*d*x^2])/(25*Sqrt[1 - c^2*x^2]) + d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x]) + (d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/3 + ((d - c^2*d*x^2)^(
5/2)*(a + b*ArcSin[c*x]))/5 - (2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]
)*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (I*b*d^2*Sqrt[d - c^2*d*x
^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b*d^2*Sqrt[d - c
^2*d*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
```

```
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\text{integral} = \frac{1}{5}\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx)) + d\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{x}\,dx - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^2\,dx}{5\sqrt{1-c^2x^2}}$$

$$= \frac{1}{3}d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{1}{5}\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx)) + d^2\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}\,dx - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int \left(1-2c^2x^2+c^4x^4\right)\,dx}{5\sqrt{1-c^2x^2}} - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)\,dx}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{8bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} + d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{3}d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{1}{5}\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx)) + \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int 1\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} + d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{3}d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{1}{5}\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx)) + \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} + d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{3}d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{1}{5}\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx)) - \frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{\left(bd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} + d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{3}d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx)) + \frac{1}{5}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx)) - \frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{\left(ibd^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(ibd^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{23bcd^2x\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} + \frac{11bc^3d^2x^3\sqrt{d-c^2dx^2}}{45\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} + d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{3}d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx)) + \frac{1}{5}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx)) - \frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{ibd^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{ibd^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 1.36 (sec) , antiderivative size = 394, normalized size of antiderivative = 1.09

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x}\,dx = \frac{1}{15}ad^2\sqrt{d-c^2dx^2}(23-11c^2x^2+3c^4x^4)+ad^{5/2}\log(x) - ad^{5/2}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)+\frac{bd^2\sqrt{d-c^2dx^2}\left(-cx+\sqrt{1-c^2x^2}\arcsin(cx)+\arcsin(cx)\log\left(1-e^{i\arcsin(\cdot)}\right.\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (a*d^2*Sqrt[d - c^2*d*x^2]*(23 - 11*c^2*x^2 + 3*c^4*x^4))/15 + a*d^(5/2)*Lo
g[x] - a*d^(5/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*d^2*Sqrt[d - c^2
*d*x^2]*(-(c*x) + Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]*Log[1 - E^(I*
ArcSin[c*x])] - ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + I*PolyLog[2, -E^(I
```

```
*ArcSin[c*x])] - I*PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (b*d
^2*Sqrt[d - c^2*d*x^2]*(9*c*x - 3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^2] + Cos[3*
ArcSin[c*x]]) + Sin[3*ArcSin[c*x]]))/(18*Sqrt[1 - c^2*x^2]) + (b*d^2*Sqrt[d
 - c^2*d*x^2]*(450*c*x - 15*ArcSin[c*x]*(30*Sqrt[1 - c^2*x^2] + 5*Cos[3*Arc
Sin[c*x]] - 3*Cos[5*ArcSin[c*x]]) + 25*Sin[3*ArcSin[c*x]] - 9*Sin[5*ArcSin[
c*x]]))/(3600*Sqrt[1 - c^2*x^2])
```

Maple [A] (verified)

Time = 0.21 (sec) , antiderivative size = 652, normalized size of antiderivative = 1.81

method	result
default	$\frac{\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}} a}{5}+\frac{a d \left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}{3}-a\,d^{\frac{5}{2}} \ln \left(\frac{2 d+2 \sqrt{d}\,\sqrt{-c^{2} d\,x^{2}+d}}{x}\right)+a\,d^{2} \sqrt{-c^{2} d\,x^{2}+d}-\frac{i b \sqrt{-d \left(c^{2} x^{2}-1\right)}\,\sqrt{-c \cdots}}{\cdots}$
parts	$\frac{\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}} a}{5}+\frac{a d \left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}{3}-a\,d^{\frac{5}{2}} \ln \left(\frac{2 d+2 \sqrt{d}\,\sqrt{-c^{2} d\,x^{2}+d}}{x}\right)+a\,d^{2} \sqrt{-c^{2} d\,x^{2}+d}-\frac{i b \sqrt{-d \left(c^{2} x^{2}-1\right)}\,\sqrt{-c \cdots}}{\cdots}$

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/5*(-c^2*d*x^2+d)^(5/2)*a+1/3*a*d*(-c^2*d*x^2+d)^(3/2)-a*d^(5/2)*ln((2*d+2
*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+a*d^2*(-c^2*d*x^2+d)^(1/2)-I*b*(-d*(c^2*x
^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*polylog(2,-I*c*x-(-c^2*x^2+
1)^(1/2))+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*pol
ylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+1/5*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-
1)*arcsin(c*x)*x^6*c^6-14/15*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsi
n(c*x)*x^4*c^4+34/15*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*x
^2*c^2+1/25*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^5
*c^5-11/45*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^3*
c^3+23/15*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x*c+b
*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*arcsin(c*x)*ln(1
+I*c*x+(-c^2*x^2+1)^(1/2))-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2
*x^2-1)*d^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-23/15*b*(-d*(c^2*x^2
-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)
```

Fricas [F]

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\arcsin(cx)\right)}{x}\,dx=\int \frac{\left(-c^{2} d x^{2}+d\right)^{\frac{5}{2}}\left(b \arcsin\left(c x\right)+a\right)}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x, x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x}\,dx = \text{Timed out}$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x,x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
[Out] b*sqrt(d)*integrate((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x) - 1/15*(15*d^(5/
2)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - 3*(-c^2*d*x^2
+ d)^(5/2) - 5*(-c^2*d*x^2 + d)^(3/2)*d - 15*sqrt(-c^2*d*x^2 + d)*d^2)*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)^{5/2}}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x,x)
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x, x)
```

3.97 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^3}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 386

$$\begin{aligned}\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^3}\,dx &= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} \\ &+ \frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\ &- \frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{2x^2} \\ &+ \frac{5c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\ &- \frac{5ibc^2d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}} \\ &+ \frac{5ibc^2d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] -5/6*c^2*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))-1/2*(-c^2*d*x^2+d)^(5/2)*
(a+b*arcsin(c*x))/x^2-5/2*c^2*d^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-1/
2*b*c*d^2*(-c^2*d*x^2+d)^(1/2)/x/(-c^2*x^2+1)^(1/2)+7/3*b*c^3*d^2*x*(-c^2*d
*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/9*b*c^5*d^2*x^3*(-c^2*d*x^2+d)^(1/2)/(-c
^2*x^2+1)^(1/2)+5*c^2*d^2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2
))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-5/2*I*b*c^2*d^2*polylog(2,-I*c*x
-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/2*I*b*c^2*d^
2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/
2)
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 386, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4785, 4787, 4783, 4803, 4268, 2317, 2438, 8, 276}

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^3}\,dx = \frac{5c^2d^2\sqrt{d-c^2dx^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{5}{6}c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx)) - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{2x^2} - \frac{5ibc^2d^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}} + \frac{5ibc^2d^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}} - \frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} + \frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(b*c*d^2*Sqrt[d - c^2*d*x^2])/(x*Sqrt[1 - c^2*x^2]) + (7*b*c^3*d^2*x*S
qrt[d - c^2*d*x^2])/(3*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^3*Sqrt[d - c^2*d*x
^2])/(9*Sqrt[1 - c^2*x^2]) - (5*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x]))/2 - (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/6 - ((d - c^2
*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(2*x^2) + (5*c^2*d^2*Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (((5*I
)/2)*b*c^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 -
 c^2*x^2] + (((5*I)/2)*b*c^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^(I*ArcSin
[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
```

```
b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\text{integral} = -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{2x^2} - \frac{1}{2}(5c^2d)\int\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{x}\,dx + \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\frac{(1-c^2x^2)^2}{x^2}\,dx}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{5}{6}c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx)) - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{2x^2} - \frac{1}{2}(5c^2d^2)\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}\,dx + \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\left(-2c^2+\frac{1}{x^2}+c^4x^2\right)dx}{2\sqrt{1-c^2x^2}} + \frac{\left(5bc^3d^2\sqrt{d-c^2dx^2}\right)\int(1-c^2x^2)\,dx}{6\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} - \frac{bc^3d^2x\sqrt{d-c^2dx^2}}{6\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{5}{6}c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx)) - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{2x^2} - \frac{\left(5c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} + \frac{\left(5bc^3d^2\sqrt{d-c^2dx^2}\right)\int 1\,dx}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{5}{6}c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx)) - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{2x^2} - \frac{\left(5c^2d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\csc(x)\,dx, x, \arcsin(cx)\right)}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{2x^2} + \frac{5c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{\left(5bc^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{2\sqrt{1-c^2x^2}} - \frac{\left(5bc^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{2x^2} + \frac{5c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(5ibc^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}} + \frac{\left(5ibc^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{7bc^3d^2x\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{2x^2} + \frac{5c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{5ibc^2d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}} + \frac{5ibc^2d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 3.28 (sec) , antiderivative size = 484, normalized size of antiderivative = 1.25

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^3}\,dx = \frac{-12ad^3(-1+c^2x^2)(-3-14c^2x^2+2c^4x^4)-180ac^2d^{5/2}x^2\sqrt{d-c^2d}}{}$$

[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^3,x]

[Out] (-12*a*d^3*(-1 + c^2*x^2)*(-3 - 14*c^2*x^2 + 2*c^4*x^4) - 180*a*c^2*d^(5/2)
*x^2*Sqrt[d - c^2*d*x^2]*Log[x] + 180*a*c^2*d^(5/2)*x^2*Sqrt[d - c^2*d*x^2]
*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + 144*b*c^2*d^3*x^2*Sqrt[1 - c^2*x^2]
*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c*x] - ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*
x])] - Log[1 + E^(I*ArcSin[c*x])]) - I*(PolyLog[2, -E^(I*ArcSin[c*x])] - Po
lyLog[2, E^(I*ArcSin[c*x])])) + 2*b*c^2*d^3*x^2*Sqrt[1 - c^2*x^2]*(9*c*x -
3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^2] + Cos[3*ArcSin[c*x]]) + Sin[3*ArcSin[c*x
]]) - 9*b*c^2*d^3*x^2*Sqrt[1 - c^2*x^2]*(2*Cot[ArcSin[c*x]/2] + ArcSin[c*x]
*Csc[ArcSin[c*x]/2]^2 + 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - 4*ArcSin
[c*x]*Log[1 + E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] - (
4*I)*PolyLog[2, E^(I*ArcSin[c*x])] - ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + 2*T
an[ArcSin[c*x]/2]))/(72*x^2*Sqrt[d - c^2*d*x^2])

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 659, normalized size of antiderivative = 1.71

method	result
default	$a\left(-\frac{(-c^2dx^2+d)^{\frac{7}{2}}}{2dx^2}-\frac{5c^2\left(\frac{(-c^2dx^2+d)^{\frac{5}{2}}}{5}+d\left(\frac{(-c^2dx^2+d)^{\frac{3}{2}}}{3}+d\left(\sqrt{-c^2dx^2+d}-\sqrt{d}\,\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2dx^2+d}}{x}\right)\right)\right)\right)}{2}\right)+b\Big($
parts	$a\left(-\frac{(-c^2dx^2+d)^{\frac{7}{2}}}{2dx^2}-\frac{5c^2\left(\frac{(-c^2dx^2+d)^{\frac{5}{2}}}{5}+d\left(\frac{(-c^2dx^2+d)^{\frac{3}{2}}}{3}+d\left(\sqrt{-c^2dx^2+d}-\sqrt{d}\,\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2dx^2+d}}{x}\right)\right)\right)\right)}{2}\right)+b\Big($

[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)

[Out] a*(-1/2/d/x^2*(-c^2*d*x^2+d)^(7/2)-5/2*c^2*(1/5*(-c^2*d*x^2+d)^(5/2)+d*(1/3
*(-c^2*d*x^2+d)^(3/2)+d*((-c^2*d*x^2+d)^(1/2)-d^(1/2)*ln((2*d+2*d^(1/2)*(-c
^2*d*x^2+d)^(1/2))/x)))))+b*(1/72*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x
^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin
(c*x))*d^2*c^2/(c^2*x^2-1)-9/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+
1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d^2*c^2/(c^2*x^2-1)-9/8*(-d*(c^2*x^2-1))^(1

```
/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d^2*c^2/(c^2*x^2-1
)+1/72*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I
*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d^2*c^2/(c^2*x^2-1)
-1/2*d^2*(c^2*x^2*arcsin(c*x)-c*x*(-c^2*x^2+1)^(1/2)-arcsin(c*x))*(-d*(c^2*
x^2-1))^(1/2)/x^2/(c^2*x^2-1)+5*I*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*arcsin(c*x)*ln(1-I*c*x-(-c
^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+polylog(2,-I*c*x-(-c^2
*x^2+1)^(1/2)))*d^2*c^2/(2*c^2*x^2-2))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin{(cx)}+a)}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^3, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(-d(cx-1)\,(cx+1))^{\frac{5}{2}}\,(a+b\operatorname{asin}{(cx)})}{x^3}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**3,x)
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))/x**3, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin{(cx)}+a)}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
[Out] b*sqrt(d)*integrate((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^3, x) + 1/6*(15*c^2*
d^(5/2)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - 3*(-c^2*d
*x^2 + d)^(5/2)*c^2 - 5*(-c^2*d*x^2 + d)^(3/2)*c^2*d - 15*sqrt(-c^2*d*x^2 +
 d)*c^2*d^2 - 3*(-c^2*d*x^2 + d)^(7/2)/(d*x^2))*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^3}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)^{5/2}}{x^3}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^3, x)
```

3.98 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^5} dx$

Optimal result

Integrand size = 27, antiderivative size = 389

$$\begin{aligned}
\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^5} dx &= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}}+\frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} \\
&- \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\frac{15}{8}c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{8x^2}-\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{4x^4} \\
&- \frac{15c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{4\sqrt{1-c^2x^2}} \\
&+ \frac{15ibc^4d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}} \\
&- \frac{15ibc^4d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] 5/8*c^2*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/x^2-1/4*(-c^2*d*x^2+d)^(5/
2)*(a+b*arcsin(c*x))/x^4+15/8*c^4*d^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2
)-1/12*b*c*d^2*(-c^2*d*x^2+d)^(1/2)/x^3/(-c^2*x^2+1)^(1/2)+9/8*b*c^3*d^2*(-
c^2*d*x^2+d)^(1/2)/x/(-c^2*x^2+1)^(1/2)-b*c^5*d^2*x*(-c^2*d*x^2+d)^(1/2)/(-
c^2*x^2+1)^(1/2)-15/4*c^4*d^2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^
(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+15/8*I*b*c^4*d^2*polylog(2,-
I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-15/8*I*b*
c^4*d^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+
1)^(1/2)
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 389, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4785, 4783, 4803, 4268, 2317, 2438, 8, 14, 276}

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^5}\,dx =$$
$$-\frac{15c^4d^2\sqrt{d-c^2dx^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4\sqrt{1-c^2x^2}}$$
$$+\frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{8x^2}-\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{4x^4}$$
$$+\frac{15}{8}c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{15ibc^4d^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}}-\frac{15ibc^4d^2\sqrt{d-c^2dx^2}\,\text{P}}{8\sqrt{1-}}$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] -1/12*(b*c*d^2*Sqrt[d - c^2*d*x^2])/(x^3*Sqrt[1 - c^2*x^2]) + (9*b*c^3*d^2*
Sqrt[d - c^2*d*x^2])/(8*x*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x*Sqrt[d - c^2*d*
x^2])/Sqrt[1 - c^2*x^2] + (15*c^4*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/8 + (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(8*x^2) - ((d -
 c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(4*x^4) - (15*c^4*d^2*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(4*Sqrt[1 - c^2*x^2])
 + (((15*I)/8)*b*c^4*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])]
)/Sqrt[1 - c^2*x^2] - (((15*I)/8)*b*c^4*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2,
E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\text{integral} = -\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{4x^4} - \frac{1}{4}\left(5c^2d\right)\int\frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{x^3}\,dx + \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\frac{\left(1-c^2x^2\right)^2}{x^4}\,dx}{4\sqrt{1-c^2x^2}}$$

$$= \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{8x^2} - \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{4x^4} + \frac{1}{8}\left(15c^4d^2\right)\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x}\,dx + \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\left(c^4+\frac{1}{x^4}-\frac{2c^2}{x^2}\right)dx}{4\sqrt{1-c^2x^2}} - \frac{\left(5bc^3d^2\sqrt{d-c^2dx^2}\right)\int\frac{1-c^2x^2}{x^2}\,dx}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{bc^3d^2\sqrt{d-c^2dx^2}}{2x\sqrt{1-c^2x^2}} + \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} + \frac{15}{8}c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{8x^2} - \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{4x^4} - \frac{\left(5bc^3d^2\sqrt{d-c^2dx^2}\right)\int\left(-c^2+\frac{1}{x^2}\right)dx}{8\sqrt{1-c^2x^2}} + \frac{\left(15c^4d^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(15bc^5d^2\sqrt{d-c^2dx^2}\right)\int 1\,dx}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{15}{8}c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{8x^2} - \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{4x^4} + \frac{\left(15c^4d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\csc(x)\,dx,x,\arcsin(cx)\right)}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{15}{8}c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{8x^2} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{4x^4} - \frac{15c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{4\sqrt{1-c^2x^2}} - \frac{\left(15bc^4d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{8\sqrt{1-c^2x^2}} + \frac{\left(15bc^4d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{15}{8}c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{8x^2} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{4x^4} - \frac{15c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{4\sqrt{1-c^2x^2}} + \frac{\left(15ibc^4d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}} - \frac{\left(15ibc^4d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}}{12x^3\sqrt{1-c^2x^2}} + \frac{9bc^3d^2\sqrt{d-c^2dx^2}}{8x\sqrt{1-c^2x^2}} - \frac{bc^5d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{15}{8}c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{8x^2} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{4x^4} - \frac{15c^4d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{4\sqrt{1-c^2x^2}} + \frac{15ibc^4d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}} - \frac{15ibc^4d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{8\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 4.90 (sec) , antiderivative size = 640, normalized size of antiderivative = 1.65

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{x^5}\,dx = \frac{ad^2\sqrt{d-c^2dx^2}(-2+9c^2x^2+8c^4x^4)}{8x^4}$$
$$+\frac{15}{8}ac^4d^{5/2}\log(x)$$
$$-\frac{15}{8}ac^4d^{5/2}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)+\frac{bc^4d^2\sqrt{d-c^2dx^2}\left(-cx+\sqrt{1-c^2x^2}\arcsin(cx)+\arcsin(cx)\log\left(1-e\right.\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x^5,x]
```

```
[Out] (a*d^2*Sqrt[d - c^2*d*x^2]*(-2 + 9*c^2*x^2 + 8*c^4*x^4))/(8*x^4) + (15*a*c^
4*d^(5/2)*Log[x])/8 - (15*a*c^4*d^(5/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]
])/8 + (b*c^4*d^2*Sqrt[d - c^2*d*x^2]*(-(c*x) + Sqrt[1 - c^2*x^2]*ArcSin[c*
x] + ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]*Log[1 + E^(I*ArcS
in[c*x])] + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E^(I*ArcSin[c*x
])]))/Sqrt[1 - c^2*x^2] - (b*c^4*d^3*Sqrt[1 - c^2*x^2]*(-2*Cot[ArcSin[c*x]/
2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c
*x])] + 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, -E^(I*A
rcSin[c*x])] + (4*I)*PolyLog[2, E^(I*ArcSin[c*x])] + ArcSin[c*x]*Sec[ArcSin
[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/(4*Sqrt[d - c^2*d*x^2]) + (b*c^4*d^2*Sq
rt[d - c^2*d*x^2]*(8*Cot[ArcSin[c*x]/2] + 6*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^
2 - c*x*Csc[ArcSin[c*x]/2]^4 - 3*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^4 - 24*ArcS
in[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 24*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x
])] - (24*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (24*I)*PolyLog[2, E^(I*ArcSin
[c*x])] - 6*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + 3*ArcSin[c*x]*Sec[ArcSin[c*x
]/2]^4 - (16*Sin[ArcSin[c*x]/2]^4)/(c^3*x^3) + 8*Tan[ArcSin[c*x]/2]))/(192*
Sqrt[1 - c^2*x^2])
```

Maple [A] (verified)

Time = 0.22 (sec) , antiderivative size = 529, normalized size of antiderivative = 1.36

method	result
default	$-\frac{a(-c^2dx^2+d)^{\frac{7}{2}}}{4dx^4}+\frac{3ac^2(-c^2dx^2+d)^{\frac{7}{2}}}{8dx^2}+\frac{3ac^4(-c^2dx^2+d)^{\frac{5}{2}}}{8}+\frac{5ac^4d(-c^2dx^2+d)^{\frac{3}{2}}}{8}-\frac{15ac^4d^{\frac{5}{2}}\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)}{8}$
parts	$-\frac{a(-c^2dx^2+d)^{\frac{7}{2}}}{4dx^4}+\frac{3ac^2(-c^2dx^2+d)^{\frac{7}{2}}}{8dx^2}+\frac{3ac^4(-c^2dx^2+d)^{\frac{5}{2}}}{8}+\frac{5ac^4d(-c^2dx^2+d)^{\frac{3}{2}}}{8}-\frac{15ac^4d^{\frac{5}{2}}\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)}{8}$

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a/d/x^4*(-c^2*d*x^2+d)^(7/2)+3/8*a*c^2/d/x^2*(-c^2*d*x^2+d)^(7/2)+3/8*
a*c^4*(-c^2*d*x^2+d)^(5/2)+5/8*a*c^4*d*(-c^2*d*x^2+d)^(3/2)-15/8*a*c^4*d^(5
/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+15/8*a*c^4*d^2*(-c^2*d*x^2+d
)^(1/2)+b*(1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*
(arcsin(c*x)+I)*c^4*d^2/(c^2*x^2-1)+1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2
+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*c^4*d^2/(c^2*x^2-1)+1/24*d^2*(27*c
^4*x^4*arcsin(c*x)-27*c^3*x^3*(-c^2*x^2+1)^(1/2)-33*c^2*x^2*arcsin(c*x)+2*c
*x*(-c^2*x^2+1)^(1/2)+6*arcsin(c*x))*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/x^4
-15*I*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(I*arcsin(c*x)*ln(1+I*c*x+(
-c^2*x^2+1)^(1/2))-I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I
*c*x+(-c^2*x^2+1)^(1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)))*c^4*d^2/(8*c
^2*x^2-8))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^5}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{x^5}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^5, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^5}\,dx = \int \frac{(-d(cx-1)\,(cx+1))^{\frac{5}{2}}\,(a+b\,\mathrm{asin}\,(cx))}{x^5}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/x**5,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))/x**5, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^5}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{x^5}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] b*sqrt(d)*integrate((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x^5, x) - 1/8*(15*c^4*
```

```
d^(5/2)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - 3*(-c^2*d
*x^2 + d)^(5/2)*c^4 - 5*(-c^2*d*x^2 + d)^(3/2)*c^4*d - 15*sqrt(-c^2*d*x^2 +
 d)*c^4*d^2 - 3*(-c^2*d*x^2 + d)^(7/2)*c^2/(d*x^2) + 2*(-c^2*d*x^2 + d)^(7/
2)/(d*x^4))*a
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^5}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/x^5,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))}{x^5}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}}{x^5}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^5,x)
```

```
[Out] int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/x^5, x)
```

3.99 $\int \sqrt{1-x^2} \arcsin(x) \, dx$

Optimal result

Integrand size = 14, antiderivative size = 34

$$\int \sqrt{1-x^2} \arcsin(x) \, dx = -\frac{x^2}{4} + \frac{1}{2} x \sqrt{1-x^2} \arcsin(x) + \frac{\arcsin(x)^2}{4}$$

```
[Out] -1/4*x^2+1/4*arcsin(x)^2+1/2*x*arcsin(x)*(-x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {4741, 4737, 30}

$$\int \sqrt{1-x^2} \arcsin(x) \, dx = \frac{1}{2} \sqrt{1-x^2} x \arcsin(x) + \frac{\arcsin(x)^2}{4} - \frac{x^2}{4}$$

```
[In] Int[Sqrt[1 - x^2]*ArcSin[x],x]
```

```
[Out] -1/4*x^2 + (x*Sqrt[1 - x^2]*ArcSin[x])/2 + ArcSin[x]^2/4
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{1}{2}x\sqrt{1-x^2}\arcsin(x) - \frac{\int x\,dx}{2} + \frac{1}{2}\int \frac{\arcsin(x)}{\sqrt{1-x^2}}\,dx \\ &= -\frac{x^2}{4} + \frac{1}{2}x\sqrt{1-x^2}\arcsin(x) + \frac{\arcsin(x)^2}{4}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 30, normalized size of antiderivative = 0.88

$$\int \sqrt{1-x^2}\arcsin(x)\,dx = \frac{1}{4}\left(-x^2 + 2x\sqrt{1-x^2}\arcsin(x) + \arcsin(x)^2\right)$$

```
[In] Integrate[Sqrt[1 - x^2]*ArcSin[x],x]
[Out] (-x^2 + 2*x*Sqrt[1 - x^2]*ArcSin[x] + ArcSin[x]^2)/4
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.91

method	result	size
default	$\frac{\arcsin(x)\left(\sqrt{-x^2+1}\,x+\arcsin(x)\right)}{2}-\frac{\arcsin(x)^2}{4}-\frac{x^2}{4}$	31

```
[In] int(arcsin(x)*(-x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/2*arcsin(x)*((-x^2+1)^(1/2)*x+arcsin(x))-1/4*arcsin(x)^2-1/4*x^2
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.76

$$\int \sqrt{1-x^2}\arcsin(x)\,dx = \frac{1}{2}\sqrt{-x^2+1}x\arcsin(x) - \frac{1}{4}x^2 + \frac{1}{4}\arcsin(x)^2$$

```
[In] integrate(arcsin(x)*(-x^2+1)^(1/2),x, algorithm="fricas")
[Out] 1/2*sqrt(-x^2 + 1)*x*arcsin(x) - 1/4*x^2 + 1/4*arcsin(x)^2
```

Sympy [A] (verification not implemented)

Time = 0.54 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.91

$$\int \sqrt{1-x^2}\arcsin(x)\,dx = -\frac{x^2}{4} + \left(\frac{x\sqrt{1-x^2}}{2} + \frac{\operatorname{asin}(x)}{2}\right)\operatorname{asin}(x) - \frac{\operatorname{asin}^2(x)}{4}$$

```
[In] integrate(asin(x)*(-x**2+1)**(1/2),x)
[Out] -x**2/4 + (x*sqrt(1 - x**2)/2 + asin(x)/2)*asin(x) - asin(x)**2/4
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 30, normalized size of antiderivative = 0.88

$$\int \sqrt{1-x^2}\arcsin(x)\,dx = -\frac{1}{4}x^2 + \frac{1}{2}\left(\sqrt{-x^2+1}x + \arcsin(x)\right)\arcsin(x) - \frac{1}{4}\arcsin(x)^2$$

```
[In] integrate(arcsin(x)*(-x^2+1)^(1/2),x, algorithm="maxima")
[Out] -1/4*x^2 + 1/2*(sqrt(-x^2 + 1)*x + arcsin(x))*arcsin(x) - 1/4*arcsin(x)^2
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.79

$$\int \sqrt{1-x^2}\arcsin(x)\,dx = \frac{1}{2}\sqrt{-x^2+1}x\arcsin(x) - \frac{1}{4}x^2 + \frac{1}{4}\arcsin(x)^2 + \frac{1}{8}$$

```
[In] integrate(arcsin(x)*(-x^2+1)^(1/2),x, algorithm="giac")
[Out] 1/2*sqrt(-x^2 + 1)*x*arcsin(x) - 1/4*x^2 + 1/4*arcsin(x)^2 + 1/8
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{1-x^2}\arcsin(x)\,dx = \int \operatorname{asin}(x)\,\sqrt{1-x^2}\,dx$$

```
[In] int(asin(x)*(1 - x^2)^(1/2),x)
[Out] int(asin(x)*(1 - x^2)^(1/2), x)
```

3.100 $\int \sqrt{\pi - c^2\pi x^2}(a + b \arcsin(cx))\,dx$

Optimal result

Integrand size = 24, antiderivative size = 68

$$\int \sqrt{\pi - c^2\pi x^2}(a + b \arcsin(cx))\,dx = -\frac{1}{4}bc\sqrt{\pi}x^2 + \frac{1}{2}x\sqrt{\pi - c^2\pi x^2}(a + b \arcsin(cx)) + \frac{\sqrt{\pi}(a + b \arcsin(cx))^2}{4bc}$$

```
[Out] -1/4*b*c*x^2*Pi^(1/2)+1/4*(a+b*arcsin(c*x))^2*Pi^(1/2)/b/c+1/2*x*(a+b*arcsi
n(c*x))*(-Pi*c^2*x^2+Pi)^(1/2)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4741, 4737, 30}

$$\int \sqrt{\pi - c^2\pi x^2}(a + b \arcsin(cx))\,dx = \frac{1}{2}x\sqrt{\pi - \pi c^2x^2}(a + b \arcsin(cx)) + \frac{\sqrt{\pi}(a + b \arcsin(cx))^2}{4bc} - \frac{1}{4}\sqrt{\pi}bcx^2$$

```
[In] Int[Sqrt[Pi - c^2*Pi*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/4*(b*c*Sqrt[Pi]*x^2) + (x*Sqrt[Pi - c^2*Pi*x^2]*(a + b*ArcSin[c*x]))/2 +
 (Sqrt[Pi]*(a + b*ArcSin[c*x])^2)/(4*b*c)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{1}{2}x\sqrt{\pi - c^2\pi x^2}(a + b\arcsin(cx)) + \frac{1}{2}\sqrt{\pi}\int \frac{a + b\arcsin(cx)}{\sqrt{1 - c^2x^2}}\,dx - \frac{1}{2}\left(bc\sqrt{\pi}\right)\int x\,dx \\ &= -\frac{1}{4}bc\sqrt{\pi}x^2 + \frac{1}{2}x\sqrt{\pi - c^2\pi x^2}(a + b\arcsin(cx)) + \frac{\sqrt{\pi}(a + b\arcsin(cx))^2}{4bc}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.28

$$\int \sqrt{\pi - c^2\pi x^2}(a + b\arcsin(cx))\,dx = \frac{\sqrt{\pi}\left(a^2 - b^2c^2x^2 + 2abcx\sqrt{1 - c^2x^2} + 2b\left(a + bcx\sqrt{1 - c^2x^2}\right)\arcsin(cx) + b^2\arcsin(cx)^2\right)}{4bc}$$

```
[In] Integrate[Sqrt[Pi - c^2*Pi*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (Sqrt[Pi]*(a^2 - b^2*c^2*x^2 + 2*a*b*c*x*Sqrt[1 - c^2*x^2] + 2*b*(a + b*c*x
*Sqrt[1 - c^2*x^2])*ArcSin[c*x] + b^2*ArcSin[c*x]^2))/(4*b*c)
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.43

method	result	size
default	$\frac{a x \sqrt{-\pi c^{2} x^{2}+\pi}}{2}+\frac{a \pi \arctan \left(\frac{\sqrt{\pi c^{2}}\, x}{\sqrt{-\pi c^{2} x^{2}+\pi}}\right)}{2 \sqrt{\pi c^{2}}}+\frac{b \sqrt{\pi}\, \left(2 \sqrt{-c^{2} x^{2}+1}\, \arcsin \left(c x\right) x c -c^{2} x^{2}+\arcsin \left(c x\right)^{2}\right)}{4 c}$	97
parts	$\frac{a x \sqrt{-\pi c^{2} x^{2}+\pi}}{2}+\frac{a \pi \arctan \left(\frac{\sqrt{\pi c^{2}}\, x}{\sqrt{-\pi c^{2} x^{2}+\pi}}\right)}{2 \sqrt{\pi c^{2}}}+\frac{b \sqrt{\pi}\, \left(2 \sqrt{-c^{2} x^{2}+1}\, \arcsin \left(c x\right) x c -c^{2} x^{2}+\arcsin \left(c x\right)^{2}\right)}{4 c}$	97

```
[In] int((a+b*arcsin(c*x))*(-Pi*c^2*x^2+Pi)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/2*a*x*(-Pi*c^2*x^2+Pi)^(1/2)+1/2*a*Pi/(Pi*c^2)^(1/2)*arctan((Pi*c^2)^(1/2
)*x/(-Pi*c^2*x^2+Pi)^(1/2))+1/4*b*Pi^(1/2)*(2*(-c^2*x^2+1)^(1/2)*arcsin(c*x
)*x*c-c^2*x^2+arcsin(c*x)^2)/c
```

Fricas [F]

$$\int \sqrt{\pi - c^2\pi x^2}(a + b\arcsin(cx))\, dx = \int \sqrt{\pi - \pi c^2x^2}(b\arcsin{(cx)} + a)\, dx$$

```
[In] integrate((a+b*arcsin(c*x))*(-pi*c^2*x^2+pi)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(pi - pi*c^2*x^2)*(b*arcsin(c*x) + a), x)
```

Sympy [A] (verification not implemented)

Time = 4.81 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.35

$$\int \sqrt{\pi - c^2\pi x^2}(a + b\arcsin(cx))\, dx = \begin{cases} \frac{\sqrt{\pi} a \left(\frac{cx\sqrt{-c^2x^2+1}}{2} + \frac{\operatorname{asin}{(cx)}}{2}\right) + \sqrt{\pi} b \left(-\frac{c^2x^2}{4} + \left(\frac{cx\sqrt{-c^2x^2+1}}{2} + \frac{\operatorname{asin}{(cx)}}{2}\right)\operatorname{asin}{(cx)} - \frac{\operatorname{asin}^2{(cx)}}{4}\right)}{c} & \text{for}\ c \neq 0 \\ \sqrt{\pi} a x & \text{otherwise} \end{cases}$$

```
[In] integrate((a+b*asin(c*x))*(-pi*c**2*x**2+pi)**(1/2),x)
[Out] Piecewise(((sqrt(pi)*a*(c*x*sqrt(-c**2*x**2 + 1)/2 + asin(c*x)/2) + sqrt(pi
)*b*(-c**2*x**2/4 + (c*x*sqrt(-c**2*x**2 + 1)/2 + asin(c*x)/2)*asin(c*x) -
asin(c*x)**2/4))/c, Ne(c, 0)), (sqrt(pi)*a*x, True))
```

Maxima [F]

$$\int \sqrt{\pi - c^2\pi x^2}(a + b \arcsin(cx))\,dx = \int \sqrt{\pi - \pi c^2x^2}(b \arcsin(cx) + a)\,dx$$

```
[In] integrate((a+b*arcsin(c*x))*(-pi*c^2*x^2+pi)^(1/2),x, algorithm="maxima")
[Out] sqrt(pi)*b*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)), x) + 1/2*(sqrt(pi - pi*c^2*x^2)*x + sqrt(pi)*arcsin(c*x)
/c)*a
```

Giac [F(-2)]

Exception generated.

$$\int \sqrt{\pi - c^2\pi x^2}(a + b \arcsin(cx))\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))*(-pi*c^2*x^2+pi)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{\pi - c^2\pi x^2}(a + b \arcsin(cx))\,dx = \int (a + b \operatorname{asin}(c\,x))\,\sqrt{\Pi - \Pi\,c^2\,x^2}\,dx$$

```
[In] int((a + b*asin(c*x))*(Pi - Pi*c^2*x^2)^(1/2),x)
[Out] int((a + b*asin(c*x))*(Pi - Pi*c^2*x^2)^(1/2), x)
```

3.101 $\int \frac{x^4 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 88

$$\int \frac{x^4 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{3x^2}{16a^3} + \frac{x^4}{16a} - \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)}{4a^2} + \frac{3\arcsin(ax)^2}{16a^5}$$

```
[Out] 3/16*x^2/a^3+1/16*x^4/a+3/16*arcsin(a*x)^2/a^5-3/8*x*arcsin(a*x)*(-a^2*x^2+
1)^(1/2)/a^4-1/4*x^3*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^2
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4795, 4737, 30}

$$\int \frac{x^4 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{3\arcsin(ax)^2}{16a^5} + \frac{3x^2}{16a^3} - \frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)}{4a^2} - \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)}{8a^4} + \frac{x^4}{16a}$$

```
[In] Int[(x^4*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (3*x^2)/(16*a^3) + x^4/(16*a) - (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(8*a^4)
 - (x^3*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(4*a^2) + (3*ArcSin[a*x]^2)/(16*a^5)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)}{4a^2}+\frac{3\int\frac{x^2\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{4a^2}+\frac{\int x^3\,dx}{4a}\\ &= \frac{x^4}{16a}-\frac{3x\sqrt{1-a^2x^2}\arcsin(ax)}{8a^4}-\frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)}{4a^2}+\frac{3\int\frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{8a^4}+\frac{3\int x\,dx}{8a^3}\\ &= \frac{3x^2}{16a^3}+\frac{x^4}{16a}-\frac{3x\sqrt{1-a^2x^2}\arcsin(ax)}{8a^4}-\frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)}{4a^2}+\frac{3\arcsin(ax)^2}{16a^5}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.73

$$\int\frac{x^4\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx=\frac{a^2x^2(3+a^2x^2)-2ax\sqrt{1-a^2x^2}(3+2a^2x^2)\arcsin(ax)+3\arcsin(ax)^2}{16a^5}$$

```
[In] Integrate[(x^4*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (a^2*x^2*(3 + a^2*x^2) - 2*a*x*Sqrt[1 - a^2*x^2]*(3 + 2*a^2*x^2)*ArcSin[a*x
] + 3*ArcSin[a*x]^2)/(16*a^5)
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.86

method	result	size
default	$\frac{-16 \arcsin(ax)\sqrt{-a^2x^2+1}\, a^3x^3+4a^4x^4-24 \arcsin(ax)\sqrt{-a^2x^2+1}\, ax+12a^2x^2+12 \arcsin(ax)^2+9}{64a^5}$	76

```
[In] int(x^4*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/64*(-16*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a^3*x^3+4*a^4*x^4-24*arcsin(a*x)*(
-a^2*x^2+1)^(1/2)*a*x+12*a^2*x^2+12*arcsin(a*x)^2+9)/a^5
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.68

$$\int \frac{x^4 \arcsin(ax)}{\sqrt{1-a^2x^2}}\, dx = \frac{a^4x^4+3\, a^2x^2-2\, (2\, a^3x^3+3\, ax)\sqrt{-a^2x^2+1}\arcsin{(ax)}+3\, \arcsin{(ax)}^2}{16\, a^5}$$

```
[In] integrate(x^4*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] 1/16*(a^4*x^4 + 3*a^2*x^2 - 2*(2*a^3*x^3 + 3*a*x)*sqrt(-a^2*x^2 + 1)*arcsin
(a*x) + 3*arcsin(a*x)^2)/a^5
```

Sympy [A] (verification not implemented)

Time = 0.40 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.93

$$\int \frac{x^4 \arcsin(ax)}{\sqrt{1-a^2x^2}}\, dx = \begin{cases} \frac{x^4}{16a} - \frac{x^3\sqrt{-a^2x^2+1}\operatorname{asin}{(ax)}}{4a^2} + \frac{3x^2}{16a^3} - \frac{3x\sqrt{-a^2x^2+1}\operatorname{asin}{(ax)}}{8a^4} + \frac{3\operatorname{asin}^2{(ax)}}{16a^5} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

```
[In] integrate(x**4*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Piecewise((x**4/(16*a) - x**3*sqrt(-a**2*x**2 + 1)*asin(a*x)/(4*a**2) + 3*x
**2/(16*a**3) - 3*x*sqrt(-a**2*x**2 + 1)*asin(a*x)/(8*a**4) + 3*asin(a*x)**
2/(16*a**5), Ne(a, 0)), (0, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.97

$$\int \frac{x^4 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{1}{16}\left(\frac{x^4}{a^2}+\frac{3\,x^2}{a^4}-\frac{3\,\arcsin{(ax)}^2}{a^6}\right)a - \frac{1}{8}\left(\frac{2\,\sqrt{-a^2x^2+1}x^3}{a^2}+\frac{3\,\sqrt{-a^2x^2+1}x}{a^4}-\frac{3\,\arcsin{(ax)}}{a^5}\right)\arcsin{(ax)}$$

```
[In] integrate(x^4*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] 1/16*(x^4/a^2 + 3*x^2/a^4 - 3*arcsin(a*x)^2/a^6)*a - 1/8*(2*sqrt(-a^2*x^2 +
 1)*x^3/a^2 + 3*sqrt(-a^2*x^2 + 1)*x/a^4 - 3*arcsin(a*x)/a^5)*arcsin(a*x)
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.03

$$\int \frac{x^4 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{(-a^2x^2+1)^{\frac{3}{2}}x\arcsin{(ax)}}{4\,a^4} - \frac{5\,\sqrt{-a^2x^2+1}x\arcsin{(ax)}}{8\,a^4} + \frac{(a^2x^2-1)^2}{16\,a^5} + \frac{3\,\arcsin{(ax)}^2}{16\,a^5} + \frac{5\,(a^2x^2-1)}{16\,a^5} + \frac{17}{128\,a^5}$$

```
[In] integrate(x^4*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] 1/4*(-a^2*x^2 + 1)^(3/2)*x*arcsin(a*x)/a^4 - 5/8*sqrt(-a^2*x^2 + 1)*x*arcsi
n(a*x)/a^4 + 1/16*(a^2*x^2 - 1)^2/a^5 + 3/16*arcsin(a*x)^2/a^5 + 5/16*(a^2*
x^2 - 1)/a^5 + 17/128/a^5
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^4\,\mathrm{asin}(a\,x)}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^4*asin(a*x))/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^4*asin(a*x))/(1 - a^2*x^2)^(1/2), x)
```

3.102 $\int \frac{x^3 \arcsin(ax)}{\sqrt{1-a^2x^2}} dx$

Optimal result

Integrand size = 22, antiderivative size = 72

$$\int \frac{x^3 \arcsin(ax)}{\sqrt{1-a^2x^2}} dx = \frac{2x}{3a^3} + \frac{x^3}{9a} - \frac{2\sqrt{1-a^2x^2}\arcsin(ax)}{3a^4} - \frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)}{3a^2}$$

```
[Out] 2/3*x/a^3+1/9*x^3/a-2/3*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^4-1/3*x^2*arcsin(a
*x)*(-a^2*x^2+1)^(1/2)/a^2
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {4795, 4767, 8, 30}

$$\int \frac{x^3 \arcsin(ax)}{\sqrt{1-a^2x^2}} dx = \frac{2x}{3a^3} - \frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)}{3a^2} - \frac{2\sqrt{1-a^2x^2}\arcsin(ax)}{3a^4} + \frac{x^3}{9a}$$

```
[In] Int[(x^3*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (2*x)/(3*a^3) + x^3/(9*a) - (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(3*a^4) - (x^
2*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(3*a^2)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)}{3a^2}+\frac{2\int\frac{x\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{3a^2}+\frac{\int x^2\,dx}{3a}\\
&= \frac{x^3}{9a}-\frac{2\sqrt{1-a^2x^2}\arcsin(ax)}{3a^4}-\frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)}{3a^2}+\frac{2\int 1\,dx}{3a^3}\\
&= \frac{2x}{3a^3}+\frac{x^3}{9a}-\frac{2\sqrt{1-a^2x^2}\arcsin(ax)}{3a^4}-\frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)}{3a^2}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.68

$$\int\frac{x^3\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx=\frac{ax(6+a^2x^2)-3\sqrt{1-a^2x^2}(2+a^2x^2)\arcsin(ax)}{9a^4}$$

```
[In] Integrate[(x^3*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
[Out] (a*x*(6 + a^2*x^2) - 3*Sqrt[1 - a^2*x^2]*(2 + a^2*x^2)*ArcSin[a*x])/(9*a^4)
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.32

method	result	size
default	$-\frac{\left(3 a^{4} x^{4} \arcsin \left(a x \right)+3 a^{2} x^{2} \arcsin \left(a x \right)+a^{3} x^{3} \sqrt{-a^{2} x^{2}+1}-6 \arcsin \left(a x \right)+6 a x \sqrt{-a^{2} x^{2}+1}\right) \sqrt{-a^{2} x^{2}+1}}{9 a^{4} \left(a^{2} x^{2}-1\right)}$	95

```
[In] int(x^3*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/9/a^4*(3*a^4*x^4*arcsin(a*x)+3*a^2*x^2*arcsin(a*x)+a^3*x^3*(-a^2*x^2+1)^
(1/2)-6*arcsin(a*x)+6*a*x*(-a^2*x^2+1)^(1/2))*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1
)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.61

$$\int \frac{x^3 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{a^{3} x^{3} - 3 \, {\left(a^{2} x^{2} + 2\right)} \sqrt{-a^{2} x^{2} + 1} \arcsin \left(a x\right) + 6 \, a x}{9 \, a^{4}}$$

```
[In] integrate(x^3*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] 1/9*(a^3*x^3 - 3*(a^2*x^2 + 2)*sqrt(-a^2*x^2 + 1)*arcsin(a*x) + 6*a*x)/a^4
```

Sympy [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.90

$$\int \frac{x^3 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{x^{3}}{9a} - \frac{x^{2}\sqrt{-a^{2}x^{2}+1}\operatorname{asin}{(ax)}}{3a^{2}} + \frac{2x}{3a^{3}} - \frac{2\sqrt{-a^{2}x^{2}+1}\operatorname{asin}{(ax)}}{3a^{4}} & \text{for}\: a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

```
[In] integrate(x**3*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Piecewise((x**3/(9*a) - x**2*sqrt(-a**2*x**2 + 1)*asin(a*x)/(3*a**2) + 2*x/
(3*a**3) - 2*sqrt(-a**2*x**2 + 1)*asin(a*x)/(3*a**4), Ne(a, 0)), (0, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.85

$$\int \frac{x^3 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{1}{9}\,a\left(\frac{x^3}{a^2}+\frac{6\,x}{a^4}\right)-\frac{1}{3}\left(\frac{\sqrt{-a^2x^2+1}x^2}{a^2}+\frac{2\sqrt{-a^2x^2+1}}{a^4}\right)\arcsin\left(ax\right)$$

```
[In] integrate(x^3*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] 1/9*a*(x^3/a^2 + 6*x/a^4) - 1/3*(sqrt(-a^2*x^2 + 1)*x^2/a^2 + 2*sqrt(-a^2*x
^2 + 1)/a^4)*arcsin(a*x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^3\,\mathrm{asin}(a\,x)}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^3*asin(a*x))/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^3*asin(a*x))/(1 - a^2*x^2)^(1/2), x)
```

3.103 $\int \frac{x^2 \arcsin(ax)}{\sqrt{1-a^2x^2}} \, dx$

Optimal result

Integrand size = 22, antiderivative size = 50

$$\int \frac{x^2 \arcsin(ax)}{\sqrt{1-a^2x^2}} \, dx = \frac{x^2}{4a} - \frac{x\sqrt{1-a^2x^2}\arcsin(ax)}{2a^2} + \frac{\arcsin(ax)^2}{4a^3}$$

```
[Out] 1/4*x^2/a+1/4*arcsin(a*x)^2/a^3-1/2*x*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^2
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4795, 4737, 30}

$$\int \frac{x^2 \arcsin(ax)}{\sqrt{1-a^2x^2}} \, dx = \frac{\arcsin(ax)^2}{4a^3} - \frac{x\sqrt{1-a^2x^2}\arcsin(ax)}{2a^2} + \frac{x^2}{4a}$$

```
[In] Int[(x^2*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] x^2/(4*a) - (x*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(2*a^2) + ArcSin[a*x]^2/(4*a^
3)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
```

```
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{x\sqrt{1-a^2x^2}\arcsin(ax)}{2a^2}+\frac{\int \frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{2a^2}+\frac{\int x\,dx}{2a}\\ &= \frac{x^2}{4a}-\frac{x\sqrt{1-a^2x^2}\arcsin(ax)}{2a^2}+\frac{\arcsin(ax)^2}{4a^3}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.86

$$\int \frac{x^2\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx=\frac{a^2x^2-2ax\sqrt{1-a^2x^2}\arcsin(ax)+\arcsin(ax)^2}{4a^3}$$

```
[In] Integrate[(x^2*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
[Out] (a^2*x^2 - 2*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x] + ArcSin[a*x]^2)/(4*a^3)
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.80

method	result	size
default	$\frac{-2\arcsin(ax)\sqrt{-a^2x^2+1}\,ax+a^2x^2+\arcsin(ax)^2}{4a^3}$	40

```
[In] int(x^2*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/4*(-2*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a*x+a^2*x^2+arcsin(a*x)^2)/a^3
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.78

$$\int \frac{x^2 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{a^2x^2 - 2\sqrt{-a^2x^2+1}ax\arcsin(ax) + \arcsin(ax)^2}{4a^3}$$

```
[In] integrate(x^2*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] 1/4*(a^2*x^2 - 2*sqrt(-a^2*x^2 + 1)*a*x*arcsin(a*x) + arcsin(a*x)^2)/a^3
```

Sympy [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.84

$$\int \frac{x^2 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{x^2}{4a} - \frac{x\sqrt{-a^2x^2+1}\,\mathrm{asin}\,(ax)}{2a^2} + \frac{\mathrm{asin}^2\,(ax)}{4a^3} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

```
[In] integrate(x**2*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Piecewise((x**2/(4*a) - x*sqrt(-a**2*x**2 + 1)*asin(a*x)/(2*a**2) + asin(a*
x)**2/(4*a**3), Ne(a, 0)), (0, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 56, normalized size of antiderivative = 1.12

$$\int \frac{x^2 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{1}{4}a\left(\frac{x^2}{a^2} - \frac{\arcsin(ax)^2}{a^4}\right) - \frac{1}{2}\left(\frac{\sqrt{-a^2x^2+1}x}{a^2} - \frac{\arcsin(ax)}{a^3}\right)\arcsin(ax)$$

```
[In] integrate(x^2*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] 1/4*a*(x^2/a^2 - arcsin(a*x)^2/a^4) - 1/2*(sqrt(-a^2*x^2 + 1)*x/a^2 - arcsi
n(a*x)/a^3)*arcsin(a*x)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 53, normalized size of antiderivative = 1.06

$$\int \frac{x^2 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{-a^2x^2+1}x \arcsin{(ax)}}{2\,a^2} + \frac{\arcsin{(ax)}^2}{4\,a^3} + \frac{a^2x^2-1}{4\,a^3} + \frac{1}{8\,a^3}$$

```
[In] integrate(x^2*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)/a^2 + 1/4*arcsin(a*x)^2/a^3 + 1/4*(a^
2*x^2 - 1)/a^3 + 1/8/a^3
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2 \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^2\,\mathrm{asin}(a\,x)}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^2*asin(a*x))/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] int((x^2*asin(a*x))/(1 - a^2*x^2)^(1/2), x)
```

3.104 $\int \frac{x \arcsin(ax)}{\sqrt{1-a^2x^2}} \, dx$

Optimal result

Integrand size = 20, antiderivative size = 29

$$\int \frac{x \arcsin(ax)}{\sqrt{1-a^2x^2}} \, dx = \frac{x}{a} - \frac{\sqrt{1-a^2x^2}\arcsin(ax)}{a^2}$$

```
[Out] x/a-arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^2
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {4767, 8}

$$\int \frac{x \arcsin(ax)}{\sqrt{1-a^2x^2}} \, dx = \frac{x}{a} - \frac{\sqrt{1-a^2x^2}\arcsin(ax)}{a^2}$$

```
[In] Int[(x*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] x/a - (Sqrt[1 - a^2*x^2]*ArcSin[a*x])/a^2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
```

```
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\sqrt{1-a^2x^2}\arcsin(ax)}{a^2} + \frac{\int 1\,dx}{a} \\ &= \frac{x}{a} - \frac{\sqrt{1-a^2x^2}\arcsin(ax)}{a^2}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{x\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{x}{a} - \frac{\sqrt{1-a^2x^2}\arcsin(ax)}{a^2}$$

```
[In] Integrate[(x*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
[Out] x/a - (Sqrt[1 - a^2*x^2]*ArcSin[a*x])/a^2
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 61 vs. 2(27) = 54.

Time = 0.10 (sec) , antiderivative size = 62, normalized size of antiderivative = 2.14

method	result	size
default	$-\frac{\sqrt{-a^2x^2+1}\left(a^2x^2\arcsin(ax)-\arcsin(ax)+ax\sqrt{-a^2x^2+1}\right)}{a^2(a^2x^2-1)}$	62

```
[In] int(x*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/a^2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)*(a^2*x^2*arcsin(a*x)-arcsin(a*x)+a*x*
(-a^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.90

$$\int \frac{x \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{ax - \sqrt{-a^2x^2+1}\arcsin{(ax)}}{a^2}$$

```
[In] integrate(x*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] (a*x - sqrt(-a^2*x^2 + 1)*arcsin(a*x))/a^2
```

Sympy [A] (verification not implemented)

Time = 0.21 (sec) , antiderivative size = 24, normalized size of antiderivative = 0.83

$$\int \frac{x \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{x}{a} - \frac{\sqrt{-a^2x^2+1}\operatorname{asin}{(ax)}}{a^2} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

```
[In] integrate(x*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Piecewise((x/a - sqrt(-a**2*x**2 + 1)*asin(a*x)/a**2, Ne(a, 0)), (0, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int \frac{x \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{x}{a} - \frac{\sqrt{-a^2x^2+1}\arcsin{(ax)}}{a^2}$$

```
[In] integrate(x*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] x/a - sqrt(-a^2*x^2 + 1)*arcsin(a*x)/a^2
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int \frac{x \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{x}{a} - \frac{\sqrt{-a^2x^2+1}\arcsin{(ax)}}{a^2}$$

```
[In] integrate(x*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] x/a - sqrt(-a^2*x^2 + 1)*arcsin(a*x)/a^2
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x\,\mathrm{asin}(a\,x)}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x*asin(a*x))/(1 - a^2*x^2)^(1/2),x)
[Out] int((x*asin(a*x))/(1 - a^2*x^2)^(1/2), x)
```

3.105 $\int \frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 13

$$\int \frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^2}{2a}$$

```
[Out] 1/2*arcsin(a*x)^2/a
```

Rubi [A] (verified)

Time = 0.01 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {4737}

$$\int \frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^2}{2a}$$

```
[In] Int[ArcSin[a*x]/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^2/(2*a)
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral} = \frac{\arcsin(ax)^2}{2a}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^2}{2a}$$

```
[In] Integrate[ArcSin[a*x]/Sqrt[1 - a^2*x^2],x]
[Out] ArcSin[a*x]^2/(2*a)
```

Maple [A] (verified)

Time = 0.07 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.92

method	result	size
derivativedivides	$\frac{\arcsin(ax)^2}{2a}$	12
default	$\frac{\arcsin(ax)^2}{2a}$	12

```
[In] int(arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/2*arcsin(a*x)^2/a
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin\left(ax\right)^2}{2\,a}$$

```
[In] integrate(arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] 1/2*arcsin(a*x)^2/a
```

Sympy [A] (verification not implemented)

Time = 0.19 (sec) , antiderivative size = 10, normalized size of antiderivative = 0.77

$$\int \frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{\operatorname{asin}^2(ax)}{2a} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

```
[In] integrate(asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Piecewise((asin(a*x)**2/(2*a), Ne(a, 0)), (0, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^2}{2a}$$

```
[In] integrate(arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] 1/2*arcsin(a*x)^2/a
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^2}{2a}$$

```
[In] integrate(arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] 1/2*arcsin(a*x)^2/a
```

Mupad [B] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{\operatorname{asin}(a\,x)^2}{2\,a}$$

```
[In] int(asin(a*x)/(1 - a^2*x^2)^(1/2),x)
[Out] asin(a*x)^2/(2*a)
```

3.106 $\int \frac{\arcsin(ax)}{x\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 52

$$\int \frac{\arcsin(ax)}{x\sqrt{1-a^2x^2}}\,dx = -2\arcsin(ax)\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) + i\,\text{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) - i\,\text{PolyLog}\left(2,e^{i\arcsin(ax)}\right)$$

```
[Out] -2*arcsin(a*x)*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))+I*polylog(2,-I*a*x-(-a^2*x
^2+1)^(1/2))-I*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4803, 4268, 2317, 2438}

$$\int \frac{\arcsin(ax)}{x\sqrt{1-a^2x^2}}\,dx = -2\arcsin(ax)\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) + i\,\text{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) - i\,\text{PolyLog}\left(2,e^{i\arcsin(ax)}\right)$$

```
[In] Int[ArcSin[a*x]/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -2*ArcSin[a*x]*ArcTanh[E^(I*ArcSin[a*x])] + I*PolyLog[2, -E^(I*ArcSin[a*x])
] - I*PolyLog[2, E^(I*ArcSin[a*x])]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \text{Subst}\left(\int x\csc(x)\,dx, x, \arcsin(ax)\right)\\
&= -2\arcsin(ax)\text{arctanh}\left(e^{i\arcsin(ax)}\right) - \text{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(ax)\right)\\
&\quad + \text{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(ax)\right)\\
&= -2\arcsin(ax)\text{arctanh}\left(e^{i\arcsin(ax)}\right) + i\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(ax)}\right)\\
&\quad - i\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(ax)}\right)\\
&= -2\arcsin(ax)\text{arctanh}\left(e^{i\arcsin(ax)}\right) + i\,\text{PolyLog}\left(2, -e^{i\arcsin(ax)}\right) - i\,\text{PolyLog}\left(2, e^{i\arcsin(ax)}\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 71, normalized size of antiderivative = 1.37

$$\int \frac{\arcsin(ax)}{x\sqrt{1-a^2x^2}}\,dx = \arcsin(ax)\left(\log\left(1-e^{i\arcsin(ax)}\right) - \log\left(1+e^{i\arcsin(ax)}\right)\right) + i\,\text{PolyLog}\left(2, -e^{i\arcsin(ax)}\right) - i\,\text{PolyLog}\left(2, e^{i\arcsin(ax)}\right)$$

```
[In] Integrate[ArcSin[a*x]/(x*Sqrt[1 - a^2*x^2]),x]
[Out] ArcSin[a*x]*(Log[1 - E^(I*ArcSin[a*x])] - Log[1 + E^(I*ArcSin[a*x])]) + I*P
olyLog[2, -E^(I*ArcSin[a*x])] - I*PolyLog[2, E^(I*ArcSin[a*x])]
```

Maple [A] (verified)

Time = 0.09 (sec) , antiderivative size = 103, normalized size of antiderivative = 1.98

method	result
default	$\arcsin(ax)\ln\left(1 - iax - \sqrt{-a^2x^2+1}\right) - \arcsin(ax)\ln\left(1 + iax + \sqrt{-a^2x^2+1}\right) + i\,\mathrm{dilog}\left(1 + ia\right.$

[In] int(arcsin(a*x)/x/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)

[Out] arcsin(a*x)*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))-arcsin(a*x)*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))+I*dilog(1+I*a*x+(-a^2*x^2+1)^(1/2))-I*dilog(1-I*a*x-(-a^2*x^2+1)^(1/2))

Fricas [F]

$$\int \frac{\arcsin(ax)}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin(ax)}{\sqrt{-a^2x^2+1}x}\,dx$$

[In] integrate(arcsin(a*x)/x/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)/(a^2*x^3 - x), x)

Sympy [F]

$$\int \frac{\arcsin(ax)}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\operatorname{asin}(ax)}{x\sqrt{-(ax-1)(ax+1)}}\,dx$$

[In] integrate(asin(a*x)/x/(-a**2*x**2+1)**(1/2),x)

[Out] Integral(asin(a*x)/(x*sqrt(-(a*x - 1)*(a*x + 1))), x)

Maxima [F]

$$\int \frac{\arcsin(ax)}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin(ax)}{\sqrt{-a^2x^2+1}x}\,dx$$

[In] integrate(arcsin(a*x)/x/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] integrate(arcsin(a*x)/(sqrt(-a^2*x^2 + 1)*x), x)

Giac [F]

$$\int \frac{\arcsin(ax)}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin(ax)}{\sqrt{-a^2x^2+1}x}\,dx$$

```
[In] integrate(arcsin(a*x)/x/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)/(sqrt(-a^2*x^2 + 1)*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\mathrm{asin}(a\,x)}{x\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(asin(a*x)/(x*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)/(x*(1 - a^2*x^2)^(1/2)), x)
```

3.107 $\int \frac{\arcsin(ax)}{x^2\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 28

$$\int \frac{\arcsin(ax)}{x^2\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{1-a^2x^2}\arcsin(ax)}{x} + a\log(x)$$

```
[Out] a*ln(x)-arcsin(a*x)*(-a^2*x^2+1)^(1/2)/x
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {4771, 29}

$$\int \frac{\arcsin(ax)}{x^2\sqrt{1-a^2x^2}}\,dx = a\log(x) - \frac{\sqrt{1-a^2x^2}\arcsin(ax)}{x}$$

```
[In] Int[ArcSin[a*x]/(x^2*Sqrt[1 - a^2*x^2]),x]
[Out] -((Sqrt[1 - a^2*x^2]*ArcSin[a*x])/x) + a*Log[x]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
```

```
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\sqrt{1-a^2x^2}\arcsin(ax)}{x} + a\int \frac{1}{x}\,dx\\ &= -\frac{\sqrt{1-a^2x^2}\arcsin(ax)}{x} + a\log(x)\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)}{x^2\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{1-a^2x^2}\arcsin(ax)}{x} + a\log(x)$$

```
[In] Integrate[ArcSin[a*x]/(x^2*Sqrt[1 - a^2*x^2]),x]
[Out] -((Sqrt[1 - a^2*x^2]*ArcSin[a*x])/x) + a*Log[x]
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.14

method	result	size
default	$-\frac{-\ln(ax)ax+\arcsin(ax)\sqrt{-a^2x^2+1}}{x}$	32

```
[In] int(arcsin(a*x)/x^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] -(-ln(a*x)*a*x+arcsin(a*x)*(-a^2*x^2+1)^(1/2))/x
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)}{x^2\sqrt{1-a^2x^2}}\,dx = \frac{ax\log\left(x\right) - \sqrt{-a^2x^2+1}\arcsin\left(ax\right)}{x}$$

```
[In] integrate(arcsin(a*x)/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] (a*x*log(x) - sqrt(-a^2*x^2 + 1)*arcsin(a*x))/x
```

Sympy [F]

$$\int \frac{\arcsin(ax)}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\operatorname{asin}(ax)}{x^2\sqrt{-(ax-1)(ax+1)}}\,dx$$

```
[In] integrate(asin(a*x)/x**2/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(asin(a*x)/(x**2*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{\arcsin(ax)}{x^2\sqrt{1-a^2x^2}}\,dx = a\log(x) - \frac{\sqrt{-a^2x^2+1}\arcsin(ax)}{x}$$

```
[In] integrate(arcsin(a*x)/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] a*log(x) - sqrt(-a^2*x^2 + 1)*arcsin(a*x)/x
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 67 vs. 2(26) = 52.

Time = 0.30 (sec) , antiderivative size = 67, normalized size of antiderivative = 2.39

$$\int \frac{\arcsin(ax)}{x^2\sqrt{1-a^2x^2}}\,dx = \frac{1}{2}\left(\frac{a^4x}{\left(\sqrt{-a^2x^2+1}|a|+a\right)|a|} - \frac{\sqrt{-a^2x^2+1}|a|+a}{x|a|}\right)\arcsin(ax) + a\log(|x|)$$

```
[In] integrate(arcsin(a*x)/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] 1/2*(a^4*x/((sqrt(-a^2*x^2 + 1)*abs(a) + a)*abs(a)) - (sqrt(-a^2*x^2 + 1)*a
bs(a) + a)/(x*abs(a)))*arcsin(a*x) + a*log(abs(x))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\mathrm{asin}(a\,x)}{x^2\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(asin(a*x)/(x^2*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)/(x^2*(1 - a^2*x^2)^(1/2)), x)
```

3.108 $\int \frac{\arcsin(ax)}{x^3\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 98

$$\int \frac{\arcsin(ax)}{x^3\sqrt{1-a^2x^2}}\,dx = -\frac{a}{2x}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)}{2x^2}-a^2\arcsin(ax)\text{arctanh}\left(e^{i\arcsin(ax)}\right)+\frac{1}{2}ia^2\,\text{PolyLog}\left(2,-e^{i\arcsin(ax)}\right)-\frac{1}{2}ia^2\,\text{PolyLog}\left(2,e^{i\arcsin(ax)}\right)$$

```
[Out] -1/2*a/x-a^2*arcsin(a*x)*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))+1/2*I*a^2*polylo
g(2,-I*a*x-(-a^2*x^2+1)^(1/2))-1/2*I*a^2*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2)
)-1/2*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4789, 4803, 4268, 2317, 2438, 30}

$$\int \frac{\arcsin(ax)}{x^3\sqrt{1-a^2x^2}}\,dx = a^2(-\arcsin(ax))\text{arctanh}\left(e^{i\arcsin(ax)}\right)+\frac{1}{2}ia^2\,\text{PolyLog}\left(2,-e^{i\arcsin(ax)}\right)-\frac{1}{2}ia^2\,\text{PolyLog}\left(2,e^{i\arcsin(ax)}\right)-\frac{\sqrt{1-a^2x^2}\arcsin(ax)}{2x^2}-\frac{a}{2x}$$

```
[In] Int[ArcSin[a*x]/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -1/2*a/x - (Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(2*x^2) - a^2*ArcSin[a*x]*ArcTan
h[E^(I*ArcSin[a*x])] + (I/2)*a^2*PolyLog[2, -E^(I*ArcSin[a*x])] - (I/2)*a^2
*PolyLog[2, E^(I*ArcSin[a*x])]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\sqrt{1-a^2x^2}\arcsin(ax)}{2x^2}+\frac{1}{2}a\int\frac{1}{x^2}\,dx+\frac{1}{2}a^2\int\frac{\arcsin(ax)}{x\sqrt{1-a^2x^2}}\,dx\\ &= -\frac{a}{2x}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)}{2x^2}+\frac{1}{2}a^2\text{Subst}\left(\int x\csc(x)\,dx,x,\arcsin(ax)\right)\end{aligned}$$

$$
\begin{aligned}
&= -\frac{a}{2x} - \frac{\sqrt{1-a^2x^2}\arcsin(ax)}{2x^2} - a^2\arcsin(ax)\text{arctanh}\left(e^{i\arcsin(ax)}\right) \\
&\quad - \frac{1}{2}a^2\text{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(ax)\right) \\
&\quad + \frac{1}{2}a^2\text{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(ax)\right) \\
&= -\frac{a}{2x} - \frac{\sqrt{1-a^2x^2}\arcsin(ax)}{2x^2} - a^2\arcsin(ax)\text{arctanh}\left(e^{i\arcsin(ax)}\right) \\
&\quad + \frac{1}{2}\left(ia^2\right)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(ax)}\right) \\
&\quad - \frac{1}{2}\left(ia^2\right)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(ax)}\right) \\
&= -\frac{a}{2x} - \frac{\sqrt{1-a^2x^2}\arcsin(ax)}{2x^2} - a^2\arcsin(ax)\text{arctanh}\left(e^{i\arcsin(ax)}\right) \\
&\quad + \frac{1}{2}ia^2\,\text{PolyLog}\left(2, -e^{i\arcsin(ax)}\right) - \frac{1}{2}ia^2\,\text{PolyLog}\left(2, e^{i\arcsin(ax)}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.69 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.40

$$
\begin{aligned}
\int \frac{\arcsin(ax)}{x^3\sqrt{1-a^2x^2}}\,dx &= \frac{1}{8}a^2\left(-2\cot\left(\frac{1}{2}\arcsin(ax)\right) - \arcsin(ax)\csc^2\left(\frac{1}{2}\arcsin(ax)\right)\right. \\
&\quad + 4\arcsin(ax)\log\left(1-e^{i\arcsin(ax)}\right) - 4\arcsin(ax)\log\left(1+e^{i\arcsin(ax)}\right) \\
&\quad + 4i\,\text{PolyLog}\left(2, -e^{i\arcsin(ax)}\right) - 4i\,\text{PolyLog}\left(2, e^{i\arcsin(ax)}\right) \\
&\quad \left. + \arcsin(ax)\sec^2\left(\frac{1}{2}\arcsin(ax)\right) - 2\tan\left(\frac{1}{2}\arcsin(ax)\right)\right)
\end{aligned}
$$

```
[In] Integrate[ArcSin[a*x]/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (a^2*(-2*Cot[ArcSin[a*x]/2] - ArcSin[a*x]*Csc[ArcSin[a*x]/2]^2 + 4*ArcSin[a
*x]*Log[1 - E^(I*ArcSin[a*x])] - 4*ArcSin[a*x]*Log[1 + E^(I*ArcSin[a*x])] +
 (4*I)*PolyLog[2, -E^(I*ArcSin[a*x])] - (4*I)*PolyLog[2, E^(I*ArcSin[a*x])]
 + ArcSin[a*x]*Sec[ArcSin[a*x]/2]^2 - 2*Tan[ArcSin[a*x]/2]))/8
```

Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.74

method	result
default	$-\frac{\sqrt{-a^2x^2+1}\left(a^2x^2\arcsin(ax)-ax\sqrt{-a^2x^2+1}-\arcsin(ax)\right)}{2(a^2x^2-1)x^2}+\frac{ia^2\left(i\arcsin(ax)\ln\left(1+iax+\sqrt{-a^2x^2+1}\right)-i\arcsin(ax)\ln\left(1-iax-\right.\right.}{}$

[In] int(arcsin(a*x)/x^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)

[Out] -1/2*(-a^2*x^2+1)^(1/2)*(a^2*x^2*arcsin(a*x)-a*x*(-a^2*x^2+1)^(1/2)-arcsin(a*x))/(a^2*x^2-1)/x^2+1/2*I*a^2*(I*arcsin(a*x)*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))-I*arcsin(a*x)*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))+polylog(2,-I*a*x-(-a^2*x^2+1)^(1/2))-polylog(2,I*a*x+(-a^2*x^2+1)^(1/2)))

Fricas [F]

$$\int \frac{\arcsin(ax)}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin(ax)}{\sqrt{-a^2x^2+1}x^3}\,dx$$

[In] integrate(arcsin(a*x)/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)/(a^2*x^5 - x^3), x)

Sympy [F]

$$\int \frac{\arcsin(ax)}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\operatorname{asin}(ax)}{x^3\sqrt{-(ax-1)(ax+1)}}\,dx$$

[In] integrate(asin(a*x)/x**3/(-a**2*x**2+1)**(1/2),x)

[Out] Integral(asin(a*x)/(x**3*sqrt(-(a*x - 1)*(a*x + 1))), x)

Maxima [F]

$$\int \frac{\arcsin(ax)}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin(ax)}{\sqrt{-a^2x^2+1}x^3}\,dx$$

[In] integrate(arcsin(a*x)/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] integrate(arcsin(a*x)/(sqrt(-a^2*x^2 + 1)*x^3), x)

Giac [F]

$$\int \frac{\arcsin(ax)}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin{(ax)}}{\sqrt{-a^2x^2+1}x^3}\,dx$$

```
[In] integrate(arcsin(a*x)/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\mathrm{asin}(a\,x)}{x^3\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(asin(a*x)/(x^3*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)/(x^3*(1 - a^2*x^2)^(1/2)), x)
```

3.109 $\int \frac{x^5(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 224

$$\int \frac{x^5(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{8bx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}}+\frac{4bx^3\sqrt{1-c^2x^2}}{45c^3\sqrt{d-c^2dx^2}} + \frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx^2}}-\frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15c^6d} - \frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15c^4d} - \frac{x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2d}$$

```
[Out] 8/15*b*x*(-c^2*x^2+1)^(1/2)/c^5/(-c^2*d*x^2+d)^(1/2)+4/45*b*x^3*(-c^2*x^2+1
)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+1/25*b*x^5*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^
2+d)^(1/2)-8/15*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^6/d-4/15*x^2*(a+b*
arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4/d-1/5*x^4*(a+b*arcsin(c*x))*(-c^2*d*x
^2+d)^(1/2)/c^2/d
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 224, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used

$= \{4795, 4767, 8, 30\}$

$$\int \frac{x^5(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2d} - \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15c^6d} - \frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15c^4d} + \frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx^2}} + \frac{8bx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}} + \frac{4bx^3\sqrt{1-c^2x^2}}{45c^3\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^5*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (8*b*x*Sqrt[1 - c^2*x^2])/(15*c^5*Sqrt[d - c^2*d*x^2]) + (4*b*x^3*Sqrt[1 -
c^2*x^2])/(45*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^5*Sqrt[1 - c^2*x^2])/(25*c*Sq
rt[d - c^2*d*x^2]) - (8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(15*c^6*d)
 - (4*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(15*c^4*d) - (x^4*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(5*c^2*d)
```

<u>Rule 8</u>

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

<u>Rule 30</u>

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

<u>Rule 4767</u>

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

<u>Rule 4795</u>

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = -\frac{x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2d} + \frac{4\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx}{5c^2} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int x^4\,dx}{5c\sqrt{d-c^2dx^2}}$$

$$= \frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx^2}} - \frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15c^4d} - \frac{x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2d} + \frac{8\int \frac{x(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx}{15c^4} + \frac{\left(4b\sqrt{1-c^2x^2}\right)\int x^2\,dx}{15c^3\sqrt{d-c^2dx^2}}$$

$$= \frac{4bx^3\sqrt{1-c^2x^2}}{45c^3\sqrt{d-c^2dx^2}} + \frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15c^6d} - \frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15c^4d} - \frac{x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2d} + \frac{\left(8b\sqrt{1-c^2x^2}\right)\int 1\,dx}{15c^5\sqrt{d-c^2dx^2}}$$

$$= \frac{8bx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}} + \frac{4bx^3\sqrt{1-c^2x^2}}{45c^3\sqrt{d-c^2dx^2}} + \frac{bx^5\sqrt{1-c^2x^2}}{25c\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15c^6d} - \frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15c^4d} - \frac{x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2d}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 119, normalized size of antiderivative = 0.53

$$\int \frac{x^5(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{bcx\sqrt{1-c^2x^2}(120+20c^2x^2+9c^4x^4)+15a(-8+4c^2x^2+c^4x^4+3c^6x^6)+15b(-8+4c^2x^2+c^4x^4+3c^6x}{225c^6\sqrt{d-c^2dx^2}}$$

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b*c*x*Sqrt[1 - c^2*x^2]*(120 + 20*c^2*x^2 + 9*c^4*x^4) + 15*a*(-8 + 4*c^2*
x^2 + c^4*x^4 + 3*c^6*x^6) + 15*b*(-8 + 4*c^2*x^2 + c^4*x^4 + 3*c^6*x^6)*Ar
cSin[c*x])/(225*c^6*Sqrt[d - c^2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.22 (sec) , antiderivative size = 521, normalized size of antiderivative = 2.33

method	result
default	$a\left(-\frac{x^4\sqrt{-c^2dx^2+d}}{5c^2d}+\frac{-\frac{4x^2\sqrt{-c^2dx^2+d}}{15c^2d}-\frac{8\sqrt{-c^2dx^2+d}}{15d\,c^4}}{c^2}\right)+b\left(\frac{5\sqrt{-d(c^2x^2-1)}\left(2c^2x^2-2icx\sqrt{-c^2x^2+1}-1\right)(i+3\arcsin(cx))}{576c^6d(c^2x^2-1)}\right.$
parts	$a\left(-\frac{x^4\sqrt{-c^2dx^2+d}}{5c^2d}+\frac{-\frac{4x^2\sqrt{-c^2dx^2+d}}{15c^2d}-\frac{8\sqrt{-c^2dx^2+d}}{15d\,c^4}}{c^2}\right)+b\left(\frac{5\sqrt{-d(c^2x^2-1)}\left(2c^2x^2-2icx\sqrt{-c^2x^2+1}-1\right)(i+3\arcsin(cx))}{576c^6d(c^2x^2-1)}\right.$

```
[In] int(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/5*x^4/c^2/d*(-c^2*d*x^2+d)^(1/2)+4/5/c^2*(-1/3*x^2/c^2/d*(-c^2*d*x^2+
d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2)))+b*(5/576*(-d*(c^2*x^2-1))^(1/2)*(
2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)*(I+3*arcsin(c*x))/c^6/d/(c^2*x^2-1)
-5/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c
*x)+I)/c^6/d/(c^2*x^2-1)-5/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*
x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^6/d/(c^2*x^2-1)+5/576*(-d*(c^2*x^2-1))^(1/
2)*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*(-I+3*arcsin(c*x))/c^6/d/(c^2*x
^2-1)+1/160*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*arcsin(c*x)*cos(6*arcs
in(c*x))-1/800*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*sin(6*arcsin(c*x))-
11/240*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*arcsin(c*x)*cos(4*arcsin(c*
x))+29/1800*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*sin(4*arcsin(c*x)))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 150, normalized size of antiderivative = 0.67

$$\int \frac{x^5(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = -\frac{(9\,bc^5x^5+20\,bc^3x^3+120\,bcx)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+15\,(3\,ac^6x^6+ac^4x^4+4\,ac^2x^2+(3\,bc^6x^6+bc^4}{225\,(c^8dx^2-c^6d)}$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/225*((9*b*c^5*x^5 + 20*b*c^3*x^3 + 120*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(
-c^2*x^2 + 1) + 15*(3*a*c^6*x^6 + a*c^4*x^4 + 4*a*c^2*x^2 + (3*b*c^6*x^6 +
b*c^4*x^4 + 4*b*c^2*x^2 - 8*b)*arcsin(c*x) - 8*a)*sqrt(-c^2*d*x^2 + d))/(c^
8*d*x^2 - c^6*d)
```

Sympy [F]

$$\int \frac{x^5(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x^5(a+b\operatorname{asin}(cx))}{\sqrt{-d(cx-1)(cx+1)}}\,dx$$

```
[In] integrate(x**5*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral(x**5*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 180, normalized size of antiderivative = 0.80

$$\begin{aligned}\int \frac{x^5(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx &= -\frac{1}{15}\left(\frac{3\sqrt{-c^2dx^2+d}x^4}{c^2d}+\frac{4\sqrt{-c^2dx^2+d}x^2}{c^4d}+\frac{8\sqrt{-c^2dx^2+d}}{c^6d}\right)b\arcsin(cx)\\&\quad-\frac{1}{15}\left(\frac{3\sqrt{-c^2dx^2+d}x^4}{c^2d}+\frac{4\sqrt{-c^2dx^2+d}x^2}{c^4d}+\frac{8\sqrt{-c^2dx^2+d}}{c^6d}\right)a\\&\quad+\frac{(9c^4x^5+20c^2x^3+120x)b}{225c^5\sqrt{d}}\end{aligned}$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
[Out] -1/15*(3*sqrt(-c^2*d*x^2 + d)*x^4/(c^2*d) + 4*sqrt(-c^2*d*x^2 + d)*x^2/(c^4
*d) + 8*sqrt(-c^2*d*x^2 + d)/(c^6*d))*b*arcsin(c*x) - 1/15*(3*sqrt(-c^2*d*x
^2 + d)*x^4/(c^2*d) + 4*sqrt(-c^2*d*x^2 + d)*x^2/(c^4*d) + 8*sqrt(-c^2*d*x^
2 + d)/(c^6*d))*a + 1/225*(9*c^4*x^5 + 20*c^2*x^3 + 120*x)*b/(c^5*sqrt(d))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^5(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^5(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x^5\,(a+b\,\mathrm{asin}(c\,x))}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((x^5*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
[Out] int((x^5*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

3.110 $\int \frac{x^4(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 200

$$\int \frac{x^4(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{3bx^2\sqrt{1-c^2x^2}}{16c^3\sqrt{d-c^2dx^2}}+\frac{bx^4\sqrt{1-c^2x^2}}{16c\sqrt{d-c^2dx^2}} - \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^4d} - \frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4c^2d} + \frac{3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{16bc^5\sqrt{d-c^2dx^2}}$$

```
[Out] 3/16*b*x^2*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+1/16*b*x^4*(-c^2*x^2
+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+3/16*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2
)/b/c^5/(-c^2*d*x^2+d)^(1/2)-3/8*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c
^4/d-1/4*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2/d
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 200, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used

$= \{4795, 4737, 30\}$

$$\int \frac{x^4(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4c^2d} + \frac{3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{16bc^5\sqrt{d-c^2dx^2}} - \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^4d} + \frac{bx^4\sqrt{1-c^2x^2}}{16c\sqrt{d-c^2dx^2}} + \frac{3bx^2\sqrt{1-c^2x^2}}{16c^3\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (3*b*x^2*Sqrt[1 - c^2*x^2])/(16*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^4*Sqrt[1 -
c^2*x^2])/(16*c*Sqrt[d - c^2*d*x^2]) - (3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcS
in[c*x]))/(8*c^4*d) - (x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(4*c^2*
d) + (3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(16*b*c^5*Sqrt[d - c^2*d*x
^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4c^2d} + \frac{3\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx}{4c^2} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int x^3\,dx}{4c\sqrt{d-c^2dx^2}} \\
&= \frac{bx^4\sqrt{1-c^2x^2}}{16c\sqrt{d-c^2dx^2}} - \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^4d} \\
&\quad - \frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4c^2d} + \frac{3\int \frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}}\,dx}{8c^4} + \frac{\left(3b\sqrt{1-c^2x^2}\right)\int x\,dx}{8c^3\sqrt{d-c^2dx^2}} \\
&= \frac{3bx^2\sqrt{1-c^2x^2}}{16c^3\sqrt{d-c^2dx^2}} + \frac{bx^4\sqrt{1-c^2x^2}}{16c\sqrt{d-c^2dx^2}} - \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^4d} \\
&\quad - \frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4c^2d} + \frac{3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{16bc^5\sqrt{d-c^2dx^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.98 (sec) , antiderivative size = 161, normalized size of antiderivative = 0.80

$$\int \frac{x^4(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$$

$$= \frac{-\frac{16acx(3+2c^2x^2)\sqrt{d-c^2dx^2}}{d} - \frac{48a\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right)}{\sqrt{d}} + \frac{b\sqrt{1-c^2x^2}(-16\cos(2\arcsin(cx))+\cos(4\arcsin(cx))+4\arcsin(cx)(6\arcsin(c}{\sqrt{d-c^2dx^2}}}{128c^5}$$

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] ((-16*a*c*x*(3 + 2*c^2*x^2)*Sqrt[d - c^2*d*x^2])/d - (48*a*ArcTan[(c*x*Sqrt
[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))])/Sqrt[d] + (b*Sqrt[1 - c^2*x^2]*
(-16*Cos[2*ArcSin[c*x]] + Cos[4*ArcSin[c*x]] + 4*ArcSin[c*x]*(6*ArcSin[c*x]
 - 8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/Sqrt[d - c^2*d*x^2])/(128*c
^5)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 376 vs. 2(174) = 348.

Time = 0.14 (sec) , antiderivative size = 377, normalized size of antiderivative = 1.88

method	result
default	$-\frac{a\,x^{3}\sqrt{-c^{2}d\,x^{2}+d}}{4c^{2}d}-\frac{3ax\sqrt{-c^{2}d\,x^{2}+d}}{8c^{4}d}+\frac{3a\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{8c^{4}\sqrt{c^{2}d}}+b\left(-\frac{3\sqrt{-d(c^{2}x^{2}-1)}\,\sqrt{-c^{2}x^{2}+1}\,\arcsin(cx)^{2}}{16c^{5}d(c^{2}x^{2}-1)}-\frac{\sqrt{-}}{16c^{5}\sqrt{}}\right.$
parts	$-\frac{a\,x^{3}\sqrt{-c^{2}d\,x^{2}+d}}{4c^{2}d}-\frac{3ax\sqrt{-c^{2}d\,x^{2}+d}}{8c^{4}d}+\frac{3a\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{8c^{4}\sqrt{c^{2}d}}+b\left(-\frac{3\sqrt{-d(c^{2}x^{2}-1)}\,\sqrt{-c^{2}x^{2}+1}\,\arcsin(cx)^{2}}{16c^{5}d(c^{2}x^{2}-1)}-\frac{\sqrt{-}}{16c^{5}\sqrt{}}\right.$

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a*x^3/c^2/d*(-c^2*d*x^2+d)^(1/2)-3/8*a/c^4*x/d*(-c^2*d*x^2+d)^(1/2)+3/
8*a/c^4/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-3/16
*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)^2-
1/16/c^5/(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)+1/8*(-d*(c^2*x^2-1))^(1/
2)/c^4/d/(c^2*x^2-1)*arcsin(c*x)*x-1/256*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*
x^2-1)*cos(5*arcsin(c*x))-1/64*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*arc
sin(c*x)*sin(5*arcsin(c*x))+15/256*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)
*cos(3*arcsin(c*x))+7/64*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*
x)*sin(3*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(b\arcsin{(cx)}+a)x^4}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^4*arcsin(c*x) + a*x^4)*sqrt(-c^2*d*x^2 + d)/(c^2*d*x^2 - d),
 x)
```

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{x^4(a+b\operatorname{asin}{(cx)})}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Maxima [F]

$$\int \frac{x^4(a + b\arcsin(cx))}{\sqrt{d - c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx) + a)x^4}{\sqrt{-c^2dx^2 + d}}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
[Out] -1/8*a*(2*sqrt(-c^2*d*x^2 + d)*x^3/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*x/(c^4*
d) - 3*arcsin(c*x)/(c^5*sqrt(d))) + b*integrate(x^4*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Giac [F]

$$\int \frac{x^4(a + b\arcsin(cx))}{\sqrt{d - c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx) + a)x^4}{\sqrt{-c^2dx^2 + d}}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^4/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a + b\arcsin(cx))}{\sqrt{d - c^2dx^2}}\,dx = \int \frac{x^4\,(a + b\,\mathrm{asin}(c\,x))}{\sqrt{d - c^2\,d\,x^2}}\,dx$$

```
[In] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
[Out] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

3.111 $\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 148

$$\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{2bx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}+\frac{bx^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}} - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^4d} - \frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2d}$$

```
[Out] 2/3*b*x*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+1/9*b*x^3*(-c^2*x^2+1)^
(1/2)/c/(-c^2*d*x^2+d)^(1/2)-2/3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4
/d-1/3*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2/d
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4795, 4767, 8, 30}

$$\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2d} - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^4d} + \frac{bx^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}}+\frac{2bx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (2*b*x*Sqrt[1 - c^2*x^2])/(3*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^3*Sqrt[1 - c^2
*x^2])/(9*c*Sqrt[d - c^2*d*x^2]) - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
]))/(3*c^4*d) - (x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*c^2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2d}+\frac{2\int\frac{x(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx}{3c^2}+\frac{\left(b\sqrt{1-c^2x^2}\right)\int x^2\,dx}{3c\sqrt{d-c^2dx^2}}\\
&= \frac{bx^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}}-\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^4d}\\
&\quad -\frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2d}+\frac{\left(2b\sqrt{1-c^2x^2}\right)\int 1\,dx}{3c^3\sqrt{d-c^2dx^2}}\\
&= \frac{2bx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}+\frac{bx^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}}-\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^4d}\\
&\quad -\frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2d}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.62

$$\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{bcx\sqrt{1-c^2x^2}(6+c^2x^2)+3a(-2+c^2x^2+c^4x^4)+3b(-2+c^2x^2+c^4x^4)\arcsin(cx)}{9c^4\sqrt{d-c^2dx^2}}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b*c*x*Sqrt[1 - c^2*x^2]*(6 + c^2*x^2) + 3*a*(-2 + c^2*x^2 + c^4*x^4) + 3*b
*(-2 + c^2*x^2 + c^4*x^4)*ArcSin[c*x])/(9*c^4*Sqrt[d - c^2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.21 (sec) , antiderivative size = 407, normalized size of antiderivative = 2.75

method	result
default	$a\left(-\frac{x^2\sqrt{-c^2dx^2+d}}{3c^2d}-\frac{2\sqrt{-c^2dx^2+d}}{3d\,c^4}\right)+b\left(\frac{\sqrt{-d(c^2x^2-1)}\left(2c^2x^2-2icx\sqrt{-c^2x^2+1}-1\right)(i+3\arcsin(cx))}{144c^4d(c^2x^2-1)}-\frac{3\sqrt{-d(c^2x^2-1)}\ (}{}\right.$
parts	$a\left(-\frac{x^2\sqrt{-c^2dx^2+d}}{3c^2d}-\frac{2\sqrt{-c^2dx^2+d}}{3d\,c^4}\right)+b\left(\frac{\sqrt{-d(c^2x^2-1)}\left(2c^2x^2-2icx\sqrt{-c^2x^2+1}-1\right)(i+3\arcsin(cx))}{144c^4d(c^2x^2-1)}-\frac{3\sqrt{-d(c^2x^2-1)}\ (}{}\right.$

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/3*x^2/c^2/d*(-c^2*d*x^2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2))+b*(1
/144*(-d*(c^2*x^2-1))^(1/2)*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)*(I+3*a
rcsin(c*x))/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x
^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(
1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^4/d/(c^2*x^2-1)
+1/144*(-d*(c^2*x^2-1))^(1/2)*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*(-I+
3*arcsin(c*x))/c^4/d/(c^2*x^2-1)-1/24*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2
-1)*arcsin(c*x)*cos(4*arcsin(c*x))+1/72*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x
^2-1)*sin(4*arcsin(c*x)))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 120, normalized size of antiderivative = 0.81

$$\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = -\frac{(bc^3x^3+6\,bcx)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+3\,(ac^4x^4+ac^2x^2+(bc^4x^4+bc^2x^2-2\,b)\arcsin{(cx)}-2\,a)\sqrt{}}{9\,(c^6dx^2-c^4d)}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/9*((b*c^3*x^3 + 6*b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 3*(a*
c^4*x^4 + a*c^2*x^2 + (b*c^4*x^4 + b*c^2*x^2 - 2*b)*arcsin(c*x) - 2*a)*sqrt
(-c^2*d*x^2 + d))/(c^6*d*x^2 - c^4*d)
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x^3(a+b\operatorname{asin}{(cx)})}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**3*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 121, normalized size of antiderivative = 0.82

$$\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = -\frac{1}{3}\,b\left(\frac{\sqrt{-c^2dx^2+d}x^2}{c^2d}+\frac{2\,\sqrt{-c^2dx^2+d}}{c^4d}\right)\arcsin{(cx)} - \frac{1}{3}\,a\left(\frac{\sqrt{-c^2dx^2+d}x^2}{c^2d}+\frac{2\,\sqrt{-c^2dx^2+d}}{c^4d}\right)+\frac{(c^2x^3+6\,x)b}{9\,c^3\sqrt{d}}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/3*b*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d) + 2*sqrt(-c^2*d*x^2 + d)/(c^4*d))*
arcsin(c*x) - 1/3*a*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d) + 2*sqrt(-c^2*d*x^2 +
 d)/(c^4*d)) + 1/9*(c^2*x^3 + 6*x)*b/(c^3*sqrt(d))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3(a + b \arcsin(cx))}{\sqrt{d - c^2 dx^2}}\, dx = \text{Exception raised: TypeError}$$

[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a + b \arcsin(cx))}{\sqrt{d - c^2 dx^2}}\, dx = \int \frac{x^3\,(a + b\,\mathrm{asin}(c\,x))}{\sqrt{d - c^2\,d\,x^2}}\, dx$$

[In] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)

[Out] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)

3.112 $\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 124

$$\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{bx^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}} - \frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^2d} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^3\sqrt{d-c^2dx^2}}$$

```
[Out] 1/4*b*x^2*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/4*(a+b*arcsin(c*x))^2
*(-c^2*x^2+1)^(1/2)/b/c^3/(-c^2*d*x^2+d)^(1/2)-1/2*x*(a+b*arcsin(c*x))*(-c^
2*d*x^2+d)^(1/2)/c^2/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4795, 4737, 30}

$$\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^2d} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^3\sqrt{d-c^2dx^2}} + \frac{bx^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b*x^2*Sqrt[1 - c^2*x^2])/(4*c*Sqrt[d - c^2*d*x^2]) - (x*Sqrt[d - c^2*d*x^2
]*(a + b*ArcSin[c*x]))/(2*c^2*d) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2
)/(4*b*c^3*Sqrt[d - c^2*d*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^2d}+\frac{\int\frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}}\,dx}{2c^2}+\frac{\left(b\sqrt{1-c^2x^2}\right)\int x\,dx}{2c\sqrt{d-c^2dx^2}}\\ &= \frac{bx^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}}-\frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^2d}+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^3\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.96 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.08

$$\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = -\frac{\frac{4acx\sqrt{d-c^2dx^2}}{d}+\frac{4a\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right)}{\sqrt{d}}+\frac{b\sqrt{1-c^2x^2}\left(-2\arcsin(cx)^2+\cos(2\arcsin(cx))+2\arcsin(cx)\sin(2\arcsin(cx))\right)}{\sqrt{d-c^2dx^2}}}{8c^3}$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] -1/8*((4*a*c*x*Sqrt[d - c^2*d*x^2])/d + (4*a*ArcTan[(c*x*Sqrt[d - c^2*d*x^2
])/(Sqrt[d]*(-1 + c^2*x^2))])/Sqrt[d] + (b*Sqrt[1 - c^2*x^2]*(-2*ArcSin[c*x
]^2 + Cos[2*ArcSin[c*x]] + 2*ArcSin[c*x]*Sin[2*ArcSin[c*x]]))/Sqrt[d - c^2*
d*x^2])/c^3
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 267 vs. $2(108) = 216$.

Time = 0.12 (sec) , antiderivative size = 268, normalized size of antiderivative = 2.16

method	result
default	$-\frac{ax\sqrt{-c^2 d\,x^2+d}}{2c^2 d}+\frac{a\arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{2c^2\sqrt{c^2 d}}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{4c^3 d(c^2x^2-1)}-\frac{\sqrt{-c^2x^2+1}}{16c^3\sqrt{-d(c^2x^2-1)}}+\frac{\sqrt{-d(}{}\right.$
parts	$-\frac{ax\sqrt{-c^2 d\,x^2+d}}{2c^2 d}+\frac{a\arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{2c^2\sqrt{c^2 d}}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{4c^3 d(c^2x^2-1)}-\frac{\sqrt{-c^2x^2+1}}{16c^3\sqrt{-d(c^2x^2-1)}}+\frac{\sqrt{-d(}{}\right.$

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2*a/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^
(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b*(-1/4*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(
1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2-1/16/c^3/(-d*(c^2*x^2-1))^(1/2)*(-c^2*
x^2+1)^(1/2)+1/8*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*arcsin(c*x)*x+1/1
6*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*cos(3*arcsin(c*x))+1/8*(-d*(c^2*
x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)*sin(3*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(b\arcsin{(cx)}+a)x^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*x^2*arcsin(c*x) + a*x^2)/(c^2*d*x^2 - d),
 x)
```

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{x^2(a+b\operatorname{asin}{(cx)})}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Maxima [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin{(cx)}+a)x^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/2*a*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*sqrt(d))) + b*int
egrate(x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(-
c*x + 1)), x)/sqrt(d)
```

Giac [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin{(cx)}+a)x^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^2/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

3.113 $\int \frac{x(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}} \, dx$

Optimal result

Integrand size = 25, antiderivative size = 67

$$\int \frac{x(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}} \, dx = \frac{bx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^2d}$$

```
[Out] b*x*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)-(a+b*arcsin(c*x))*(-c^2*d*x^2
+d)^(1/2)/c^2/d
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {4767, 8}

$$\int \frac{x(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}} \, dx = \frac{bx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^2d}$$

```
[In] Int[(x*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]))/(c^2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
```

```
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^2d}+\frac{\left(b\sqrt{1-c^2x^2}\right)\int 1\,dx}{c\sqrt{d-c^2dx^2}}\\ &= \frac{bx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^2d}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.96

$$\int \frac{x(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\frac{bcx\sqrt{1-c^2x^2}+a(-1+c^2x^2)+b(-1+c^2x^2)\arcsin(cx)}{c^2\sqrt{d-c^2dx^2}}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
[Out] (b*c*x*Sqrt[1 - c^2*x^2] + a*(-1 + c^2*x^2) + b*(-1 + c^2*x^2)*ArcSin[c*x])
/(c^2*Sqrt[d - c^2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.11 (sec) , antiderivative size = 159, normalized size of antiderivative = 2.37

method	result
default	$-\frac{a\sqrt{-c^2dx^2+d}}{c^2d}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(c^2x^2-icx\sqrt{-c^2x^2+1}-1\right)(\arcsin(cx)+i)}{2c^2d(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\left(icx\sqrt{-c^2x^2+1}+c^2x^2-1\right)(a}{2c^2d(c^2x^2-1)}\right.$
parts	$-\frac{a\sqrt{-c^2dx^2+d}}{c^2d}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(c^2x^2-icx\sqrt{-c^2x^2+1}-1\right)(\arcsin(cx)+i)}{2c^2d(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\left(icx\sqrt{-c^2x^2+1}+c^2x^2-1\right)(a}{2c^2d(c^2x^2-1)}\right.$

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
[Out] -a/c^2/d*(-c^2*d*x^2+d)^(1/2)+b*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c
^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^2/d/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1
))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^2/d/(c^2*x^
2-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.37

$$\int \frac{x(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}bcx+(ac^2x^2+(bc^2x^2-b)\arcsin(cx)-a)\sqrt{-c^2dx^2+d}}{c^4dx^2-c^2d}$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] -(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x + (a*c^2*x^2 + (b*c^2*x^2 -
 b)*arcsin(c*x) - a)*sqrt(-c^2*d*x^2 + d))/(c^4*d*x^2 - c^2*d)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{x(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.87

$$\int \frac{x(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{bx}{c\sqrt{d}} - \frac{\sqrt{-c^2dx^2+d}b\arcsin(cx)}{c^2d} - \frac{\sqrt{-c^2dx^2+d}a}{c^2d}$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] b*x/(c*sqrt(d)) - sqrt(-c^2*d*x^2 + d)*b*arcsin(c*x)/(c^2*d) - sqrt(-c^2*d*
x^2 + d)*a/(c^2*d)
```

Giac [F]

$$\int \frac{x(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)x}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x\,(a+b\,\mathrm{asin}(c\,x))}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
[Out] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

3.114 $\int \frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 49

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}}\,dx = \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}}$$

```
[Out] 1/2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042, Rules used = {4737}

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}}\,dx = \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/Sqrt[d - c^2*d*x^2],x]
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d - c^2*d*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.02

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}}\,dx=\frac{\sqrt{1-c^2x^2}\arcsin(cx)(2a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/Sqrt[d - c^2*d*x^2],x]
[Out] (Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(2*a + b*ArcSin[c*x]))/(2*c*Sqrt[d - c^2*d*x
^2])
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.76

method	result	size
default	$\frac{a\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}-\frac{b\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{2cd(c^2x^2-1)}$	86
parts	$\frac{a\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}-\frac{b\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{2cd(c^2x^2-1)}$	86

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
[Out] a/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/2*b*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)^2
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{b\arcsin(cx)+a}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*x^2 - d), x)
```

Sympy [F]

$$\int \frac{a + b \arcsin(cx)}{\sqrt{d - c^2 dx^2}} \, dx = \int \frac{a + b \operatorname{asin}(cx)}{\sqrt{-d(cx - 1)(cx + 1)}} \, dx$$

```
[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral((a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 28, normalized size of antiderivative = 0.57

$$\int \frac{a + b \arcsin(cx)}{\sqrt{d - c^2 dx^2}} \, dx = \frac{b \arcsin(cx)^2}{2 c \sqrt{d}} + \frac{a \arcsin(cx)}{c \sqrt{d}}$$

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
[Out] 1/2*b*arcsin(c*x)^2/(c*sqrt(d)) + a*arcsin(c*x)/(c*sqrt(d))
```

Giac [F]

$$\int \frac{a + b \arcsin(cx)}{\sqrt{d - c^2 dx^2}} \, dx = \int \frac{b \arcsin(cx) + a}{\sqrt{-c^2 dx^2 + d}} \, dx$$

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(cx)}{\sqrt{d - c^2 dx^2}} \, dx = \int \frac{a + b \operatorname{asin}(c\,x)}{\sqrt{d - c^2\,d\,x^2}} \, dx$$

```
[In] int((a + b*asin(c*x))/(d - c^2*d*x^2)^(1/2),x)
[Out] int((a + b*asin(c*x))/(d - c^2*d*x^2)^(1/2), x)
```

3.115 $\int \frac{a+b\arcsin(cx)}{x\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 145

$$\int \frac{a+b\arcsin(cx)}{x\sqrt{d-c^2dx^2}}\,dx = -\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}$$

```
[Out] -2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(
-c^2*d*x^2+d)^(1/2)+I*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(
1/2)/(-c^2*d*x^2+d)^(1/2)-I*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2
+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4803, 4268, 2317, 2438}

$$\int \frac{a+b\arcsin(cx)}{x\sqrt{d-c^2dx^2}}\,dx = -\frac{2\sqrt{1-c^2x^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}} + \frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] (-2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[
d - c^2*d*x^2] + (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqr
t[d - c^2*d*x^2] - (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sq
rt[d - c^2*d*x^2]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int (a+bx)\csc(x)\,dx,x,\arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}\\
&= -\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= -\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{\left(ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{\left(ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}$$

$$= -\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.01

$$\int\frac{a+b\arcsin(cx)}{x\sqrt{d-c^2dx^2}}\,dx = \frac{a\log(x)}{\sqrt{d}} - \frac{a\log\left(d+\sqrt{d}\sqrt{-d\left(-1+c^2x^2\right)}\right)}{\sqrt{d}} + \frac{b\sqrt{1-c^2x^2}\left(\arcsin(cx)\left(\log\left(1-e^{i\arcsin(cx)}\right)-\log\left(1+e^{i\arcsin(cx)}\right)\right)+i\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)-i\,\text{Poly}\right.}{\sqrt{d\left(1-c^2x^2\right)}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*Sqrt[d - c^2*d*x^2]),x]
[Out] (a*Log[x])/Sqrt[d] - (a*Log[d + Sqrt[d]*Sqrt[-(d*(-1 + c^2*x^2))]])/Sqrt[d]
 + (b*Sqrt[1 - c^2*x^2]*(ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 +
E^(I*ArcSin[c*x])]) + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E^(I*
ArcSin[c*x])]))/Sqrt[d*(1 - c^2*x^2)]
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.24

method	result
default	$-\frac{a\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2d\,x^2+d}}{x}\right)}{\sqrt{d}} - \frac{ib\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\left(i\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)-i\arcsin(cx)\ln\left(1-icx-\sqrt{-c^2x^2}\right.\right.}{d(c^2x^2-1)}$
parts	$-\frac{a\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2d\,x^2+d}}{x}\right)}{\sqrt{d}} - \frac{ib\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\left(i\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)-i\arcsin(cx)\ln\left(1-icx-\sqrt{-c^2x^2}\right.\right.}{d(c^2x^2-1)}$

```
[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -a/d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-I*b*(-c^2*x^2+1)^(1/2
)*(-d*(c^2*x^2-1))^(1/2)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*ar
csin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)
)+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)))/d/(c^2*x^2-1)
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x\sqrt{d-c^2dx^2}}\,dx = \int \frac{b\arcsin(cx)+a}{\sqrt{-c^2dx^2+dx}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*x^3 - d*x), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x\sqrt{d-c^2dx^2}}\,dx = \int \frac{a+b\,\mathrm{asin}\,(cx)}{x\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x\sqrt{d-c^2dx^2}}\,dx = \int \frac{b\arcsin(cx)+a}{\sqrt{-c^2dx^2+dx}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(
-c*x + 1)*x), x)/sqrt(d) - a*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*
d/abs(x))/sqrt(d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{x\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x\sqrt{d-c^2dx^2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{x\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^(1/2)), x)
```

3.116 $\int \frac{a+b\arcsin(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 66

$$\int \frac{a+b\arcsin(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx=-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{dx}+\frac{bc\sqrt{1-c^2x^2}\log(x)}{\sqrt{d-c^2dx^2}}$$

```
[Out] b*c*ln(x)*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-(a+b*arcsin(c*x))*(-c^2*d
*x^2+d)^(1/2)/d/x
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.074, Rules used = {4771, 29}

$$\int \frac{a+b\arcsin(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx=\frac{bc\sqrt{1-c^2x^2}\log(x)}{\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{dx}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -((Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(d*x)) + (b*c*Sqrt[1 - c^2*x^2]
*Log[x])/Sqrt[d - c^2*d*x^2]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
```

```
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{dx}+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int\frac{1}{x}\,dx}{\sqrt{d-c^2dx^2}}\\ &= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{dx}+\frac{bc\sqrt{1-c^2x^2}\log(x)}{\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.23

$$\int\frac{a+b\arcsin(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx=\frac{\sqrt{d-c^2dx^2}\left(-a\sqrt{1-c^2x^2}-b\sqrt{1-c^2x^2}\arcsin(cx)+bcx\log(x)\right)}{dx\sqrt{1-c^2x^2}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*Sqrt[d - c^2*d*x^2]),x]
[Out] (Sqrt[d - c^2*d*x^2]*(-(a*Sqrt[1 - c^2*x^2]) - b*Sqrt[1 - c^2*x^2]*ArcSin[c
*x] + b*c*x*Log[x]))/(d*x*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.14 (sec) , antiderivative size = 204, normalized size of antiderivative = 3.09

method	result
default	$-\frac{a\sqrt{-c^2dx^2+d}}{dx}+b\left(\frac{2i\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\arcsin(cx)c}{d(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\left(icx\sqrt{-c^2x^2+1}+c^2x^2-1\right)\arcsin(cx)}{dx(c^2x^2-1)}-\frac{\sqrt{-d}}{}\right.$
parts	$-\frac{a\sqrt{-c^2dx^2+d}}{dx}+b\left(\frac{2i\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\arcsin(cx)c}{d(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\left(icx\sqrt{-c^2x^2+1}+c^2x^2-1\right)\arcsin(cx)}{dx(c^2x^2-1)}-\frac{\sqrt{-d}}{}\right.$

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
[Out] -a/d/x*(-c^2*d*x^2+d)^(1/2)+b*(2*I*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2
)/d/(c^2*x^2-1)*arcsin(c*x)*c-(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*
x*c+c^2*x^2-1)*arcsin(c*x)/d/x/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2
+1)^(1/2)/d/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c)
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 218, normalized size of antiderivative = 3.30

$$\int \frac{a+b\arcsin(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx = \left[\frac{bc\sqrt{d}x\log\left(\frac{c^2dx^6+c^2dx^2-dx^4-\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}(x^4-1)\sqrt{d}-d}{c^2x^4-x^2}\right)-2\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{2\,dx}, \frac{bc\sqrt{-d}x\,a\right.$$

[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")

[Out] [1/2*(b*c*sqrt(d)*x*log((c^2*d*x^6 + c^2*d*x^2 - d*x^4 - sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^4 - x^2)) - 2*sqrt(-c^2 *d*x^2 + d)*(b*arcsin(c*x) + a))/(d*x), (b*c*sqrt(-d)*x*arctan(sqrt(-c^2*d* x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d*x^4 - (c^2 + 1)*d*x^2 + d)) - sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a))/(d*x)]

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{a+b\operatorname{asin}(cx)}{x^2\sqrt{-d(cx-1)(cx+1)}}\,dx$$

[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**(1/2),x)

[Out] Integral((a + b*asin(c*x))/(x**2*sqrt(-d*(c*x - 1)*(c*x + 1))), x)

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.58

$$\int \frac{a+b\arcsin(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx = -\frac{\left((-1)^{-2\,c^2dx^2+2\,d}\sqrt{d}\log\left(-2\,c^2d+\frac{2\,d}{x^2}\right)+\sqrt{d}\log\left(x^2-\frac{1}{c^2}\right)\right)bc}{2\,d} - \frac{\sqrt{-c^2dx^2+d}b\arcsin(cx)}{dx} - \frac{\sqrt{-c^2dx^2+d}a}{dx}$$

[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")

[Out] -1/2*((-1)^(-2*c^2*d*x^2 + 2*d)*sqrt(d)*log(-2*c^2*d + 2*d/x^2) + sqrt(d)*l og(x^2 - 1/c^2))*b*c/d - sqrt(-c^2*d*x^2 + d)*b*arcsin(c*x)/(d*x) - sqrt(-c ^2*d*x^2 + d)*a/(d*x)

Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{x^2\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^(1/2)), x)
```

3.117 $\int \frac{a+b\arcsin(cx)}{x^3\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 229

$$\int \frac{a+b\arcsin(cx)}{x^3\sqrt{d-c^2dx^2}}\,dx = -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2dx^2} - \frac{c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2\sqrt{d-c^2dx^2}} - \frac{ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2\sqrt{d-c^2dx^2}}$$

```
[Out] -1/2*b*c*(-c^2*x^2+1)^(1/2)/x/(-c^2*d*x^2+d)^(1/2)-c^2*(a+b*arcsin(c*x))*ar
ctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+1/2
*I*b*c^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^
2+d)^(1/2)-1/2*I*b*c^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/
2)/(-c^2*d*x^2+d)^(1/2)-1/2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/d/x^2
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used

$= \{4789, 4803, 4268, 2317, 2438, 30\}$

$$\int \frac{a+b\arcsin(cx)}{x^3\sqrt{d-c^2dx^2}}\,dx = -\frac{c^2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2dx^2} + \frac{ibc^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2\sqrt{d-c^2dx^2}} - \frac{ibc^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -1/2*(b*c*Sqrt[1 - c^2*x^2])/(x*Sqrt[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x]))/(2*d*x^2) - (c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
)*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] + ((I/2)*b*c^2*Sqrt[1 - c
^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - ((I/2)*b*c^2*
Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
```

```
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

integral

$$= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2dx^2} + \frac{1}{2}c^2\int \frac{a+b\arcsin(cx)}{x\sqrt{d-c^2dx^2}}\,dx + \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{x^2}\,dx}{2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2dx^2} + \frac{\left(c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \arcsin(cx)\right)}{2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2dx^2} - \frac{c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{\left(bc^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{2\sqrt{d-c^2dx^2}} + \frac{\left(bc^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2dx^2} - \frac{c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{\left(ibc^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2\sqrt{d-c^2dx^2}} - \frac{\left(ibc^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2\sqrt{d-c^2dx^2}}$$

$$
= -\frac{bc\sqrt{1-c^2x^2}}{2x\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2dx^2}
- \frac{c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}
+ \frac{ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2\sqrt{d-c^2dx^2}} - \frac{ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2\sqrt{d-c^2dx^2}}
$$

Mathematica [A] (verified)

Time = 1.74 (sec) , antiderivative size = 244, normalized size of antiderivative = 1.07

$$
\int \frac{a+b\arcsin(cx)}{x^3\sqrt{d-c^2dx^2}}\,dx
$$

$$
= \frac{-\frac{4a\sqrt{d-c^2dx^2}}{x^2} + 4ac^2\sqrt{d}\log(x) - 4ac^2\sqrt{d}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right) + \frac{bc^2d^2(1-c^2x^2)^{3/2}(-2\cot(\frac{1}{2}\arcsin(cx))-\arcsin(cx)}{}}{}
$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] ((-4*a*Sqrt[d - c^2*d*x^2])/x^2 + 4*a*c^2*Sqrt[d]*Log[x] - 4*a*c^2*Sqrt[d]*
Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*c^2*d^2*(1 - c^2*x^2)^(3/2)*(-2*C
ot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 + 4*ArcSin[c*x]*Log[1
- E^(I*ArcSin[c*x])] - 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + (4*I)*Pol
yLog[2, -E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, E^(I*ArcSin[c*x])] + ArcSin[
c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/(d - c^2*d*x^2)^(3/2))/(
8*d)
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.21

method	result
default	$-\frac{a\sqrt{-c^2dx^2+d}}{2dx^2} - \frac{ac^2\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)}{2\sqrt{d}} + b\left(-\frac{\left(c^2x^2\arcsin(cx)-cx\sqrt{-c^2x^2+1}-\arcsin(cx)\right)\sqrt{-d(c^2x^2-1)}}{2x^2d(c^2x^2-1)} - \frac{i\sqrt{-c}}{}\right.$
parts	$-\frac{a\sqrt{-c^2dx^2+d}}{2dx^2} - \frac{ac^2\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)}{2\sqrt{d}} + b\left(-\frac{\left(c^2x^2\arcsin(cx)-cx\sqrt{-c^2x^2+1}-\arcsin(cx)\right)\sqrt{-d(c^2x^2-1)}}{2x^2d(c^2x^2-1)} - \frac{i\sqrt{-c}}{}\right.$

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/d/x^2*(-c^2*d*x^2+d)^(1/2)-1/2*a*c^2/d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2
*d*x^2+d)^(1/2))/x)+b*(-1/2*(c^2*x^2*arcsin(c*x)-c*x*(-c^2*x^2+1)^(1/2)-arc
sin(c*x))*(-d*(c^2*x^2-1))^(1/2)/x^2/d/(c^2*x^2-1)-1/2*I*(-c^2*x^2+1)^(1/2)
*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1
```

```
)^(1/2))-I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2
*x^2+1)^(1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)))*c^2)
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\sqrt{d-c^2dx^2}}\,dx=\int \frac{b\arcsin(cx)+a}{\sqrt{-c^2dx^2+d}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*x^5 - d*x^3), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\sqrt{d-c^2dx^2}}\,dx=\int \frac{a+b\operatorname{asin}(cx)}{x^3\sqrt{-d(cx-1)(cx+1)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral((a + b*asin(c*x))/(x**3*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\sqrt{d-c^2dx^2}}\,dx=\int \frac{b\arcsin(cx)+a}{\sqrt{-c^2dx^2+d}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
[Out] -1/2*(c^2*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/sqrt(d) +
 sqrt(-c^2*d*x^2 + d)/(d*x^2))*a + b*integrate(arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(-c*x + 1)*x^3), x)/sqrt(d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{x^3\sqrt{d-c^2dx^2}}\,dx=\text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^3\sqrt{d-c^2dx^2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{x^3\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^(1/2)),x)
[Out] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^(1/2)), x)
```

3.118 $\int \frac{a+b\arcsin(cx)}{x^4\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 147

$$\int \frac{a+b\arcsin(cx)}{x^4\sqrt{d-c^2dx^2}}\,dx = -\frac{bc\sqrt{1-c^2x^2}}{6x^2\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3dx^3} - \frac{2c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3dx} + \frac{2bc^3\sqrt{1-c^2x^2}\log(x)}{3\sqrt{d-c^2dx^2}}$$

```
[Out] -1/6*b*c*(-c^2*x^2+1)^(1/2)/x^2/(-c^2*d*x^2+d)^(1/2)+2/3*b*c^3*ln(x)*(-c^2*
x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2
)/d/x^3-2/3*c^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/d/x
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4789, 4771, 29, 30}

$$\int \frac{a+b\arcsin(cx)}{x^4\sqrt{d-c^2dx^2}}\,dx = -\frac{2c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3dx} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3dx^3} - \frac{bc\sqrt{1-c^2x^2}}{6x^2\sqrt{d-c^2dx^2}} + \frac{2bc^3\sqrt{1-c^2x^2}\log(x)}{3\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -1/6*(b*c*Sqrt[1 - c^2*x^2])/(x^2*Sqrt[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x]))/(3*d*x^3) - (2*c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSi
n[c*x]))/(3*d*x) + (2*b*c^3*Sqrt[1 - c^2*x^2]*Log[x])/(3*Sqrt[d - c^2*d*x^2
])
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3dx^3} \\
&\quad +\frac{1}{3}\left(2c^2\right)\int\frac{a+b\arcsin(cx)}{x^2\sqrt{d-c^2dx^2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int\frac{1}{x^3}\,dx}{3\sqrt{d-c^2dx^2}} \\
&= -\frac{bc\sqrt{1-c^2x^2}}{6x^2\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3dx^3} \\
&\quad -\frac{2c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3dx}+\frac{\left(2bc^3\sqrt{1-c^2x^2}\right)\int\frac{1}{x}\,dx}{3\sqrt{d-c^2dx^2}} \\
&= -\frac{bc\sqrt{1-c^2x^2}}{6x^2\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3dx^3} \\
&\quad -\frac{2c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3dx}+\frac{2bc^3\sqrt{1-c^2x^2}\log(x)}{3\sqrt{d-c^2dx^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.92

$$\int \frac{a+b\arcsin(cx)}{x^4\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\left(bcx+6bc^3x^3+2a\sqrt{1-c^2x^2}+4ac^2x^2\sqrt{1-c^2x^2}+2b\sqrt{1-c^2x^2}(1+2c^2x^2)\arcsin(cx)-4\right.}{6dx^3\sqrt{1-c^2x^2}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -1/6*(Sqrt[d - c^2*d*x^2]*(b*c*x + 6*b*c^3*x^3 + 2*a*Sqrt[1 - c^2*x^2] + 4*
a*c^2*x^2*Sqrt[1 - c^2*x^2] + 2*b*Sqrt[1 - c^2*x^2]*(1 + 2*c^2*x^2)*ArcSin[
c*x] - 4*b*c^3*x^3*Log[x]))/(d*x^3*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.17 (sec) , antiderivative size = 850, normalized size of antiderivative = 5.78

method	result
default	$a\left(-\frac{\sqrt{-c^2dx^2+d}}{3dx^3}-\frac{2c^2\sqrt{-c^2dx^2+d}}{3dx}\right)-\frac{2ib\sqrt{-d(c^2x^2-1)}\,x^3(-c^2x^2+1)c^6}{3(3c^4x^4-2c^2x^2-1)d}+\frac{4ib\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)c^3}{3d(c^2x^2-1)}-$
parts	$a\left(-\frac{\sqrt{-c^2dx^2+d}}{3dx^3}-\frac{2c^2\sqrt{-c^2dx^2+d}}{3dx}\right)-\frac{2ib\sqrt{-d(c^2x^2-1)}\,x^3(-c^2x^2+1)c^6}{3(3c^4x^4-2c^2x^2-1)d}+\frac{4ib\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)c^3}{3d(c^2x^2-1)}-$

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/3/d/x^3*(-c^2*d*x^2+d)^(1/2)-2/3*c^2/d/x*(-c^2*d*x^2+d)^(1/2))-2/3*I*
b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*(-c^2*x^2+1)*c^6+4/3
*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*c^
3-2*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^2*arcsin(c*x)*(-
c^2*x^2+1)^(1/2)*c^5-2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)
/d*x^5*c^8-2*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*arcsin(
c*x)*c^6+1/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*c^4+1/3
*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*c^6-2/3*I*b*(-d*(
c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*
c^3+1/3*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*arcsin(c*x)*c^
4-1/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*(-c^2*x^2+1)*c
^4+1/2*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*c^3*(-c^2*x^2+1)^
(1/2)+4/3*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x*arcsin(c*x)*
c^2+1/6*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x^2*(-c^2*x^2+1)
^(1/2)*c+1/3*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x^3*arcsin(
```

```
c*x)-2/3*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*ln((I*c*
x+(-c^2*x^2+1)^(1/2))^2-1)*c^3
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 433, normalized size of antiderivative = 2.95

$$\int \frac{a+b\arcsin(cx)}{x^4\sqrt{d-c^2dx^2}}\,dx = \left[\frac{2\left(bc^5x^5-bc^3x^3\right)\sqrt{d}\log\left(\frac{c^2dx^6+c^2dx^2-dx^4-\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}(x^4-1)\sqrt{d}-d}{c^2x^4-x^2}\right)-\sqrt{-c^2dx^2+d}(bcx^3-bcx)\sqrt{-c^2}}{6\left(c^2dx^5-dx^3\right)}\right.$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/6*(2*(b*c^5*x^5 - b*c^3*x^3)*sqrt(d)*log((c^2*d*x^6 + c^2*d*x^2 - d*x^4
- sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^4 - 1)*sqrt(d) - d)/(c^2*x^4 -
 x^2)) - sqrt(-c^2*d*x^2 + d)*(b*c*x^3 - b*c*x)*sqrt(-c^2*x^2 + 1) - 2*(2*a
*c^4*x^4 - a*c^2*x^2 + (2*b*c^4*x^4 - b*c^2*x^2 - b)*arcsin(c*x) - a)*sqrt(
-c^2*d*x^2 + d))/(c^2*d*x^5 - d*x^3), 1/6*(4*(b*c^5*x^5 - b*c^3*x^3)*sqrt(-
d)*arctan(sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*(x^2 + 1)*sqrt(-d)/(c^2*d
*x^4 - (c^2 + 1)*d*x^2 + d)) - sqrt(-c^2*d*x^2 + d)*(b*c*x^3 - b*c*x)*sqrt(
-c^2*x^2 + 1) - 2*(2*a*c^4*x^4 - a*c^2*x^2 + (2*b*c^4*x^4 - b*c^2*x^2 - b)*
arcsin(c*x) - a)*sqrt(-c^2*d*x^2 + d))/(c^2*d*x^5 - d*x^3)]
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\sqrt{d-c^2dx^2}}\,dx = \int \frac{a+b\,\mathrm{asin}\,(cx)}{x^4\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**4*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 124, normalized size of antiderivative = 0.84

$$\int \frac{a+b\arcsin(cx)}{x^4\sqrt{d-c^2dx^2}}\,dx = \frac{1}{6}\left(\frac{4\,c^2\log\left(x\right)}{\sqrt{d}} - \frac{1}{\sqrt{d}x^2}\right)bc - \frac{1}{3}\,b\left(\frac{2\,\sqrt{-c^2dx^2+d}c^2}{dx} + \frac{\sqrt{-c^2dx^2+d}}{dx^3}\right)\arcsin\left(cx\right) - \frac{1}{3}\,a\left(\frac{2\,\sqrt{-c^2dx^2+d}c^2}{dx} + \frac{\sqrt{-c^2dx^2+d}}{dx^3}\right)$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
[Out] 1/6*(4*c^2*log(x)/sqrt(d) - 1/(sqrt(d)*x^2))*b*c - 1/3*b*(2*sqrt(-c^2*d*x^2
 + d)*c^2/(d*x) + sqrt(-c^2*d*x^2 + d)/(d*x^3))*arcsin(c*x) - 1/3*a*(2*sqrt
(-c^2*d*x^2 + d)*c^2/(d*x) + sqrt(-c^2*d*x^2 + d)/(d*x^3))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{x^4\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^4\sqrt{d-c^2dx^2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{x^4\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^(1/2)),x)
[Out] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^(1/2)), x)
```

3.119 $\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 221

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = -\frac{5bx\sqrt{d-c^2dx^2}}{3c^5d^2\sqrt{1-c^2x^2}} - \frac{bx^3\sqrt{d-c^2dx^2}}{9c^3d^2\sqrt{1-c^2x^2}} + \frac{a+b\arcsin(cx)}{c^6d\sqrt{d-c^2dx^2}} + \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^6d^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^6d^3} - \frac{b\sqrt{d-c^2dx^2}\operatorname{arctanh}(cx)}{c^6d^2\sqrt{1-c^2x^2}}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/c^6/d^3+(a+b*arcsin(c*x))/c^6/d
/(-c^2*d*x^2+d)^(1/2)+2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^6/d^2-5/3*
b*x*(-c^2*d*x^2+d)^(1/2)/c^5/d^2/(-c^2*x^2+1)^(1/2)-1/9*b*x^3*(-c^2*d*x^2+d
)^(1/2)/c^3/d^2/(-c^2*x^2+1)^(1/2)-b*arctanh(c*x)*(-c^2*d*x^2+d)^(1/2)/c^6/
d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {272, 45, 4779, 12, 1167, 212}

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^6d^3} + \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^6d^2} + \frac{a+b\arcsin(cx)}{c^6d\sqrt{d-c^2dx^2}} - \frac{b\operatorname{arctanh}(cx)\sqrt{d-c^2dx^2}}{c^6d^2\sqrt{1-c^2x^2}} - \frac{5bx\sqrt{d-c^2dx^2}}{3c^5d^2\sqrt{1-c^2x^2}} - \frac{bx^3\sqrt{d-c^2dx^2}}{9c^3d^2\sqrt{1-c^2x^2}}$$

```
[In] Int[(x^5*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (-5*b*x*Sqrt[d - c^2*d*x^2])/(3*c^5*d^2*Sqrt[1 - c^2*x^2]) - (b*x^3*Sqrt[d
- c^2*d*x^2])/(9*c^3*d^2*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(c^6*d*Sq
rt[d - c^2*d*x^2]) + (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(c^6*d^2)
- ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c^6*d^3) - (b*Sqrt[d - c^2
*d*x^2]*ArcTanh[c*x])/(c^6*d^2*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\text{integral} = \frac{a+b\arcsin(cx)}{c^6d\sqrt{d-c^2dx^2}}+\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^6d^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^6d^3}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{8-4c^2x^2-c^4x^4}{3c^6d^2(1-c^2x^2)}\,dx}{\sqrt{1-c^2x^2}}$$

$$=\frac{a+b\arcsin(cx)}{c^6d\sqrt{d-c^2dx^2}}+\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^6d^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^6d^3}-\frac{\left(b\sqrt{d-c^2dx^2}\right)\int\frac{8-4c^2x^2-c^4x^4}{1-c^2x^2}\,dx}{3c^5d^2\sqrt{1-c^2x^2}}$$

$$=\frac{a+b\arcsin(cx)}{c^6d\sqrt{d-c^2dx^2}}+\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^6d^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^6d^3}-\frac{\left(b\sqrt{d-c^2dx^2}\right)\int\left(5+c^2x^2+\frac{3}{1-c^2x^2}\right)\,dx}{3c^5d^2\sqrt{1-c^2x^2}}$$

$$=-\frac{5bx\sqrt{d-c^2dx^2}}{3c^5d^2\sqrt{1-c^2x^2}}-\frac{bx^3\sqrt{d-c^2dx^2}}{9c^3d^2\sqrt{1-c^2x^2}} +\frac{a+b\arcsin(cx)}{c^6d\sqrt{d-c^2dx^2}}+\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^6d^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^6d^3}-\frac{\left(b\sqrt{d-c^2dx^2}\right)\int\frac{1}{1-c^2x^2}\,dx}{c^5d^2\sqrt{1-c^2x^2}}$$

$$=-\frac{5bx\sqrt{d-c^2dx^2}}{3c^5d^2\sqrt{1-c^2x^2}}-\frac{bx^3\sqrt{d-c^2dx^2}}{9c^3d^2\sqrt{1-c^2x^2}} +\frac{a+b\arcsin(cx)}{c^6d\sqrt{d-c^2dx^2}}+\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^6d^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^6d^3}-\frac{b\sqrt{d-c^2dx^2}\,\text{arctanh}(cx)}{c^6d^2\sqrt{1-c^2x^2}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

Time = 0.23 (sec) , antiderivative size = 166, normalized size of antiderivative = 0.75

$$\int\frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\frac{\sqrt{d-c^2dx^2}\left(\sqrt{-c^2}\left(bcx\sqrt{1-c^2x^2}(15+c^2x^2)+3a(-8+4c^2x^2+c^4x^4)+3b(-8\right.\right.}{9c^6\sqrt{-c^2}d^2\,(}$$

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(Sqrt[-c^2]*(b*c*x*Sqrt[1 - c^2*x^2]*(15 + c^2*x^2) +
3*a*(-8 + 4*c^2*x^2 + c^4*x^4) + 3*b*(-8 + 4*c^2*x^2 + c^4*x^4)*ArcSin[c*x]
) - (9*I)*b*c*Sqrt[1 - c^2*x^2]*EllipticF[I*ArcSinh[Sqrt[-c^2]*x], 1]))/(9*
c^6*Sqrt[-c^2]*d^2*(-1 + c^2*x^2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.34 (sec) , antiderivative size = 425, normalized size of antiderivative = 1.92

method	result
default	$a\left(-\frac{x^4}{3c^2d\sqrt{-c^2dx^2+d}}+\frac{-\frac{4x^2}{3c^2d\sqrt{-c^2dx^2+d}}+\frac{8}{3dc^4\sqrt{-c^2dx^2+d}}}{c^2}\right)-\frac{65b\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)}{24c^6d^2(c^2x^2-1)}-\frac{b\sqrt{-d(c^2x^2-1)}\,\sin(4\,\mathrm{ar}}{72c^6d^2(c^2x^2-1}$
parts	$a\left(-\frac{x^4}{3c^2d\sqrt{-c^2dx^2+d}}+\frac{-\frac{4x^2}{3c^2d\sqrt{-c^2dx^2+d}}+\frac{8}{3dc^4\sqrt{-c^2dx^2+d}}}{c^2}\right)-\frac{65b\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)}{24c^6d^2(c^2x^2-1)}-\frac{b\sqrt{-d(c^2x^2-1)}\,\sin(4\,\mathrm{ar}}{72c^6d^2(c^2x^2-1}$

```
[In] int(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/3*x^4/c^2/d/(-c^2*d*x^2+d)^(1/2)+4/3/c^2*(-x^2/c^2/d/(-c^2*d*x^2+d)^(
1/2)+2/d/c^4/(-c^2*d*x^2+d)^(1/2)))-65/24*b*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/
(c^2*x^2-1)*arcsin(c*x)-1/72*b*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*s
in(4*arcsin(c*x))+31/18*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*(-c^2*
x^2+1)^(1/2)*x+5/3*b*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)
*x^2+1/24*b*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*arcsin(c*x)*cos(4*ar
csin(c*x))+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^6/d^2/(c^2*x^2-1)*
ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/
c^6/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 441, normalized size of antiderivative = 2.00

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \left[\frac{9\,(bc^2x^2-b)\sqrt{d}\log\left(-\frac{c^6dx^6+5\,c^4dx^4-5\,c^2dx^2+4\,(c^3x^3+cx)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\sqrt{d}-d}{c^6x^6-3\,c^4x^4+3\,c^2x^2-1}\right)+}{}\right.$$

$$-\frac{9\,(bc^2x^2-b)\sqrt{-d}\arctan\left(\frac{2\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}c\sqrt{-d}x}{c^4dx^4-d}\right)-2\,(bc^3x^3+15\,bcx)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}-6\,(a}{18\,(c^8d^2x^2-c^6d^2)}$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/36*(9*(b*c^2*x^2 - b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^
2 + 4*(c^3*x^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/
(c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - 1)) + 4*(b*c^3*x^3 + 15*b*c*x)*sqrt(-c^2
*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + 12*(a*c^4*x^4 + 4*a*c^2*x^2 + (b*c^4*x^4 +
 4*b*c^2*x^2 - 8*b)*arcsin(c*x) - 8*a)*sqrt(-c^2*d*x^2 + d))/(c^8*d^2*x^2 -
 c^6*d^2), -1/18*(9*(b*c^2*x^2 - b)*sqrt(-d)*arctan(2*sqrt(-c^2*d*x^2 + d)*
```

```
sqrt(-c^2*x^2 + 1)*c*sqrt(-d)*x/(c^4*d*x^4 - d)) - 2*(b*c^3*x^3 + 15*b*c*x)
*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 6*(a*c^4*x^4 + 4*a*c^2*x^2 + (b*
c^4*x^4 + 4*b*c^2*x^2 - 8*b)*arcsin(c*x) - 8*a)*sqrt(-c^2*d*x^2 + d))/(c^8*
d^2*x^2 - c^6*d^2)]
```

Sympy [F]

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^5(a+b\operatorname{asin}(cx))}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x**5*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral(x**5*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)x^5}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
[Out] -1/3*a*(x^4/(sqrt(-c^2*d*x^2 + d)*c^2*d) + 4*x^2/(sqrt(-c^2*d*x^2 + d)*c^4*
d) - 8/(sqrt(-c^2*d*x^2 + d)*c^6*d)) - 1/3*(3*sqrt(c*x + 1)*sqrt(-c*x + 1)*
c^6*d^2*integrate(1/3*(c^4*x^6 + 4*c^2*x^4 - 8*x^2)/(c^7*d^2*x^4 - c^5*d^2*
x^2 + (c^5*d^2*x^2 - c^3*d^2)*e^(log(c*x + 1) + log(-c*x + 1))), x) + (c^4*
x^4 + 4*c^2*x^2 - 8)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(sqrt(c*
x + 1)*sqrt(-c*x + 1)*c^6*d^(3/2))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^5\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((x^5*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
[Out] int((x^5*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.120 $\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 214

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = -\frac{bx^2\sqrt{1-c^2x^2}}{4c^3d\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^4d^2} - \frac{3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^5d\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{2c^5d\sqrt{d-c^2dx^2}}$$

```
[Out] x^3*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/4*b*x^2*(-c^2*x^2+1)^(1/
2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-3/4*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/
c^5/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*ln(-c^2*x^2+1)*(-c^2*x^2+1)^(1/2)/c^5/d/(-
c^2*d*x^2+d)^(1/2)+3/2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4/d^2
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4791, 4795, 4737, 30, 272, 45}

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{x^3(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^5d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^4d^2} + \frac{b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{2c^5d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}}{4c^3d\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -1/4*(b*x^2*Sqrt[1 - c^2*x^2])/(c^3*d*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*Ar
cSin[c*x]))/(c^2*d*Sqrt[d - c^2*d*x^2]) + (3*x*Sqrt[d - c^2*d*x^2]*(a + b*A
rcSin[c*x]))/(2*c^4*d^2) - (3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b
*c^5*d*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(2*c^5
*d*Sqrt[d - c^2*d*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
```

```
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^3(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{3\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^3}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}} \\
&= \frac{x^3(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^4d^2} - \frac{3\int \frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}}\,dx}{2c^4d} \\
&\quad - \frac{\left(3b\sqrt{1-c^2x^2}\right)\int x\,dx}{2c^3d\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{x}{1-c^2x}\,dx,x,x^2\right)}{2cd\sqrt{d-c^2dx^2}} \\
&= -\frac{3bx^2\sqrt{1-c^2x^2}}{4c^3d\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^4d^2} \\
&\quad - \frac{3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^5d\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \left(-\frac{1}{c^2}-\frac{1}{c^2(-1+c^2x)}\right)dx,x,x^2\right)}{2cd\sqrt{d-c^2dx^2}} \\
&= -\frac{bx^2\sqrt{1-c^2x^2}}{4c^3d\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^4d^2} \\
&\quad - \frac{3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^5d\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2c^5d\sqrt{d-c^2dx^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.49 (sec) , antiderivative size = 173, normalized size of antiderivative = 0.81

$$\int \frac{x^4(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{-4ac\sqrt{d}x(-3+c^2x^2)+12a\sqrt{d-c^2dx^2}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right)+b\sqrt{d}(8cx\arcsin}{}$$

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (-4*a*c*Sqrt[d]*x*(-3 + c^2*x^2) + 12*a*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x*Sqr
t[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + b*Sqrt[d]*(8*c*x*ArcSin[c*x]
+ Sqrt[1 - c^2*x^2]*(-6*ArcSin[c*x]^2 + Cos[2*ArcSin[c*x]] + 4*Log[1 - c^2*
x^2] + 2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])))/(8*c^5*d^(3/2)*Sqrt[d - c^2*d*x^
2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.16 (sec) , antiderivative size = 432, normalized size of antiderivative = 2.02

method	result
default	$-\frac{a\,x^{3}}{2c^{2}d\sqrt{-c^{2}d\,x^{2}+d}}+\frac{3ax}{2c^{4}d\sqrt{-c^{2}d\,x^{2}+d}}-\frac{3a\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{2c^{4}d\sqrt{c^{2}d}}+\frac{3b\sqrt{-d(c^{2}x^{2}-1)}\,\sqrt{-c^{2}x^{2}+1}\,\arcsin(cx)^{2}}{4c^{5}d^{2}(c^{2}x^{2}-1)}+\frac{ib\sqrt{-d(c}{}$
parts	$-\frac{a\,x^{3}}{2c^{2}d\sqrt{-c^{2}d\,x^{2}+d}}+\frac{3ax}{2c^{4}d\sqrt{-c^{2}d\,x^{2}+d}}-\frac{3a\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{2c^{4}d\sqrt{c^{2}d}}+\frac{3b\sqrt{-d(c^{2}x^{2}-1)}\,\sqrt{-c^{2}x^{2}+1}\,\arcsin(cx)^{2}}{4c^{5}d^{2}(c^{2}x^{2}-1)}+\frac{ib\sqrt{-d(c}{}$

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a*x^3/c^2/d/(-c^2*d*x^2+d)^(1/2)+3/2*a/c^4*x/d/(-c^2*d*x^2+d)^(1/2)-3/
2*a/c^4/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+3/4*b*
(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)^2
+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c
*x)-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*ln(1+(I
*c*x+(-c^2*x^2+1)^(1/2))^2)-1/16*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-
1)*(-c^2*x^2+1)^(1/2)-9/8*b*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcs
in(c*x)*x-1/16*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*cos(3*arcsin(c*
x))-1/8*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)*sin(3*arcs
in(c*x))
```

Fricas [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(b\arcsin(cx)+a)x^4}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)*sqrt(-c^2*d*x^2 + d)/(c^4*d^2*x^4 - 2*
c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^4(a+b\,\mathrm{asin}\,(cx))}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)x^4}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/2*a*(x^3/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 3*x/(sqrt(-c^2*d*x^2 + d)*c^4*d)
 + 3*arcsin(c*x)/(c^5*d^(3/2))) - b*integrate(x^4*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))/((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d
)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^4\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
[Out] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.121 $\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 142

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = -\frac{bx\sqrt{d-c^2dx^2}}{c^3d^2\sqrt{1-c^2x^2}}+\frac{a+b\arcsin(cx)}{c^4d\sqrt{d-c^2dx^2}} + \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^4d^2}-\frac{b\sqrt{d-c^2dx^2}\operatorname{arctanh}(cx)}{c^4d^2\sqrt{1-c^2x^2}}$$

```
[Out] (a+b*arcsin(c*x))/c^4/d/(-c^2*d*x^2+d)^(1/2)+(a+b*arcsin(c*x))*(-c^2*d*x^2+
d)^(1/2)/c^4/d^2-b*x*(-c^2*d*x^2+d)^(1/2)/c^3/d^2/(-c^2*x^2+1)^(1/2)-b*arct
anh(c*x)*(-c^2*d*x^2+d)^(1/2)/c^4/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {272, 45, 4779, 12, 396, 212}

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^4d^2} + \frac{a+b\arcsin(cx)}{c^4d\sqrt{d-c^2dx^2}}-\frac{b\operatorname{arctanh}(cx)\sqrt{d-c^2dx^2}}{c^4d^2\sqrt{1-c^2x^2}}-\frac{bx\sqrt{d-c^2dx^2}}{c^3d^2\sqrt{1-c^2x^2}}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -((b*x*Sqrt[d - c^2*d*x^2])/(c^3*d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*
x])/(c^4*d*Sqrt[d - c^2*d*x^2]) + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))
/(c^4*d^2) - (b*Sqrt[d - c^2*d*x^2]*ArcTanh[c*x])/(c^4*d^2*Sqrt[1 - c^2*x^2
])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a+b\arcsin(cx)}{c^4d\sqrt{d-c^2dx^2}}+\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^4d^2}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{2-c^2x^2}{c^4d^2(1-c^2x^2)}\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{a+b\arcsin(cx)}{c^4d\sqrt{d-c^2dx^2}}+\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^4d^2}-\frac{\left(b\sqrt{d-c^2dx^2}\right)\int\frac{2-c^2x^2}{1-c^2x^2}\,dx}{c^3d^2\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{bx\sqrt{d-c^2dx^2}}{c^3d^2\sqrt{1-c^2x^2}} + \frac{a+b\arcsin(cx)}{c^4d\sqrt{d-c^2dx^2}} + \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^4d^2} - \frac{\left(b\sqrt{d-c^2dx^2}\right)\int \frac{1}{1-c^2x^2}\,dx}{c^3d^2\sqrt{1-c^2x^2}}$$

$$= -\frac{bx\sqrt{d-c^2dx^2}}{c^3d^2\sqrt{1-c^2x^2}} + \frac{a+b\arcsin(cx)}{c^4d\sqrt{d-c^2dx^2}} + \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^4d^2} - \frac{b\sqrt{d-c^2dx^2}\text{arctanh}(cx)}{c^4d^2\sqrt{1-c^2x^2}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

Time = 0.17 (sec) , antiderivative size = 136, normalized size of antiderivative = 0.96

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{d-c^2dx^2}\left(\sqrt{-c^2}\left(-2a+ac^2x^2+bcx\sqrt{1-c^2x^2}+b(-2+c^2x^2)\arcsin(cx)\right) - \right.}{c^4\sqrt{-c^2}d^2\left(-1+c^2x^2\right)}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(Sqrt[-c^2]*(-2*a + a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2
] + b*(-2 + c^2*x^2)*ArcSin[c*x]) - I*b*c*Sqrt[1 - c^2*x^2]*EllipticF[I*Arc
Sinh[Sqrt[-c^2]*x], 1]))/(c^4*Sqrt[-c^2]*d^2*(-1 + c^2*x^2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.25 (sec) , antiderivative size = 307, normalized size of antiderivative = 2.16

method	result
default	$a\left(-\frac{x^2}{c^2d\sqrt{-c^2d\,x^2+d}}+\frac{2}{d\,c^4\sqrt{-c^2d\,x^2+d}}\right)+\frac{b\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,x}{c^3d^2(c^2x^2-1)}+\frac{b\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)x^2}{c^2d^2(c^2x^2-1)}-\frac{2b\sqrt{-d(c^2x^2-}}{c^4d^2(c^2}$
parts	$a\left(-\frac{x^2}{c^2d\sqrt{-c^2d\,x^2+d}}+\frac{2}{d\,c^4\sqrt{-c^2d\,x^2+d}}\right)+\frac{b\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,x}{c^3d^2(c^2x^2-1)}+\frac{b\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)x^2}{c^2d^2(c^2x^2-1)}-\frac{2b\sqrt{-d(c^2x^2-}}{c^4d^2(c^2}$

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-x^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+2/d/c^4/(-c^2*d*x^2+d)^(1/2))+b*(-d*(c^2
*x^2-1))^(1/2)/c^3/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x+b*(-d*(c^2*x^2-1))^
(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)*x^2-2*b*(-d*(c^2*x^2-1))^(1/2)/c^4/d^
2/(c^2*x^2-1)*arcsin(c*x)+b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^4/d
^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)-b*(-d*(c^2*x^2-1))^(1/2)*(-c^
2*x^2+1)^(1/2)/c^4/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 382, normalized size of antiderivative = 2.69

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \left[\frac{4\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}bcx+(bc^2x^2-b)\sqrt{d}\log\left(-\frac{c^6dx^6+5c^4dx^4-5c^2dx^2+4(c}{c^6x^6-3}\right.}{4(c}\right.$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/4*(4*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x + (b*c^2*x^2 - b)*sqr
t(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^2 + 4*(c^3*x^3 + c*x)*sqrt(-
c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/(c^6*x^6 - 3*c^4*x^4 + 3*c^2
*x^2 - 1)) + 4*(a*c^2*x^2 + (b*c^2*x^2 - 2*b)*arcsin(c*x) - 2*a)*sqrt(-c^2*
d*x^2 + d))/(c^6*d^2*x^2 - c^4*d^2), 1/2*(2*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*
x^2 + 1)*b*c*x - (b*c^2*x^2 - b)*sqrt(-d)*arctan(2*sqrt(-c^2*d*x^2 + d)*sqr
t(-c^2*x^2 + 1)*c*sqrt(-d)*x/(c^4*d*x^4 - d)) + 2*(a*c^2*x^2 + (b*c^2*x^2 -
 2*b)*arcsin(c*x) - 2*a)*sqrt(-c^2*d*x^2 + d))/(c^6*d^2*x^2 - c^4*d^2)]
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^3(a+b\operatorname{asin}(cx))}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**3*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.00

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = -\frac{1}{2}bc\left(\frac{2x}{c^4d^{\frac{3}{2}}}+\frac{\log(cx+1)}{c^5d^{\frac{3}{2}}}-\frac{\log(cx-1)}{c^5d^{\frac{3}{2}}}\right) - b\left(\frac{x^2}{\sqrt{-c^2dx^2+d}c^2d}-\frac{2}{\sqrt{-c^2dx^2+d}c^4d}\right)\arcsin(cx) - a\left(\frac{x^2}{\sqrt{-c^2dx^2+d}c^2d}-\frac{2}{\sqrt{-c^2dx^2+d}c^4d}\right)$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/2*b*c*(2*x/(c^4*d^(3/2)) + log(c*x + 1)/(c^5*d^(3/2)) - log(c*x - 1)/(c^
5*d^(3/2))) - b*(x^2/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 2/(sqrt(-c^2*d*x^2 + d)
*c^4*d))*arcsin(c*x) - a*(x^2/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 2/(sqrt(-c^2*d
*x^2 + d)*c^4*d))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3(a + b\arcsin(cx))}{(d - c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a + b\arcsin(cx))}{(d - c^2dx^2)^{3/2}}\,dx = \int \frac{x^3\,(a + b\,\mathrm{asin}(c\,x))}{(d - c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.122 $\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 135

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{x(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{2c^3d\sqrt{d-c^2dx^2}}$$

```
[Out] x*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/2*(a+b*arcsin(c*x))^2*(-c^
2*x^2+1)^(1/2)/b/c^3/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*ln(-c^2*x^2+1)*(-c^2*x^2+
1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4791, 4737, 266}

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{x(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{2c^3d\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x]))/(c^2*d*Sqrt[d - c^2*d*x^2]) - (Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])^2)/(2*b*c^3*d*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]
*Log[1 - c^2*x^2])/(2*c^3*d*Sqrt[d - c^2*d*x^2])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{x(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}}-\frac{\int \frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}}\,dx}{c^2d}-\frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}\\ &= \frac{x(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}}-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2c^3d\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.19

$$\begin{aligned}\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx &= -\frac{ax\sqrt{-d\left(-1+c^2x^2\right)}}{c^2d^2\left(-1+c^2x^2\right)}+\frac{a\arctan\left(\frac{cx\sqrt{-d(-1+c^2x^2)}}{\sqrt{d}(-1+c^2x^2)}\right)}{c^3d^{3/2}}\\ &\quad+\frac{b\left(2cx\arcsin(cx)-\sqrt{1-c^2x^2}\left(\arcsin(cx)^2-2\log\left(\sqrt{1-c^2x^2}\right)\right)\right)}{2c^3d\sqrt{d\left(1-c^2x^2\right)}}\end{aligned}$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -((a*x*Sqrt[-(d*(-1 + c^2*x^2))])/(c^2*d^2*(-1 + c^2*x^2))) + (a*ArcTan[(c*
x*Sqrt[-(d*(-1 + c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))])/(c^3*d^(3/2)) + (b*
(2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*(ArcSin[c*x]^2 - 2*Log[Sqrt[1 - c^2*
x^2]])))/(2*c^3*d*Sqrt[d*(1 - c^2*x^2)])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.13 (sec) , antiderivative size = 274, normalized size of antiderivative = 2.03

method	result
default	$\frac{ax}{c^2d\sqrt{-c^2d\,x^2+d}}-\frac{a\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{c^2d\sqrt{c^2d}}+\frac{b\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{2c^3d^2(c^2x^2-1)}+\frac{ib\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(c}{c^3d^2(c^2x^2-1)}$
parts	$\frac{ax}{c^2d\sqrt{-c^2d\,x^2+d}}-\frac{a\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{c^2d\sqrt{c^2d}}+\frac{b\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{2c^3d^2(c^2x^2-1)}+\frac{ib\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(c}{c^3d^2(c^2x^2-1)}$

```
[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*x/c^2/d/(-c^2*d*x^2+d)^(1/2)-a/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x
/(-c^2*d*x^2+d)^(1/2))+1/2*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/
d^2/(c^2*x^2-1)*arcsin(c*x)^2+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
/c^3/d^2/(c^2*x^2-1)*arcsin(c*x)-b*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-
1)*arcsin(c*x)*x-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(c^2*x
^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(b\arcsin(cx)+a)x^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*x^2*arcsin(c*x) + a*x^2)/(c^4*d^2*x^4 - 2*
c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{x^2(a+b\operatorname{asin}(cx))}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)x^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] a*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2))) - b*integrat
e(x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^2*d*x^2 - d)*sqrt(c*x
+ 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.123 $\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 73

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{a+b\arcsin(cx)}{c^2d\sqrt{d-c^2dx^2}} - \frac{b\sqrt{1-c^2x^2}\text{arctanh}(cx)}{c^2d\sqrt{d-c^2dx^2}}$$

```
[Out] (a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(1/2)-b*arctanh(c*x)*(-c^2*x^2+1)^(1
/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {4767, 212}

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{a+b\arcsin(cx)}{c^2d\sqrt{d-c^2dx^2}} - \frac{b\sqrt{1-c^2x^2}\text{arctanh}(cx)}{c^2d\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (a + b*ArcSin[c*x])/(c^2*d*Sqrt[d - c^2*d*x^2]) - (b*Sqrt[1 - c^2*x^2]*ArcT
anh[c*x])/(c^2*d*Sqrt[d - c^2*d*x^2])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{a+b\arcsin(cx)}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{1}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}\\ &= \frac{a+b\arcsin(cx)}{c^2d\sqrt{d-c^2dx^2}} - \frac{b\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{c^2d\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.70

$$\int\frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{a+b\arcsin(cx)-b\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{c^2d\sqrt{d-c^2dx^2}}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (a + b*ArcSin[c*x] - b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(c^2*d*Sqrt[d - c^2*
d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.12 (sec) , antiderivative size = 194, normalized size of antiderivative = 2.66

method	result
default	$\frac{a}{c^2d\sqrt{-c^2dx^2+d}}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\arcsin(cx)}{c^2d^2(c^2x^2-1)}+\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\ln\left(icx+\sqrt{-c^2x^2+1}+i\right)}{c^2d^2(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c}}{c}\right.$
parts	$\frac{a}{c^2d\sqrt{-c^2dx^2+d}}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\arcsin(cx)}{c^2d^2(c^2x^2-1)}+\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\ln\left(icx+\sqrt{-c^2x^2+1}+i\right)}{c^2d^2(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c}}{c}\right.$

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a/c^2/d/(-c^2*d*x^2+d)^(1/2)+b*(-(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)
*arcsin(c*x)+(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^2/d^2/(c^2*x^2-1)*
ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^
2/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 279, normalized size of antiderivative = 3.82

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \left[\frac{(bc^2x^2-b)\sqrt{d}\log\left(-\frac{c^6dx^6+5\,c^4dx^4-5\,c^2dx^2+4\,(c^3x^3+cx)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}\sqrt{d}-d}{c^6x^6-3\,c^4x^4+3\,c^2x^2-1}\right)-4}{4\,(c^4d^2x^2-c^2d^2)}\right.$$
$$\left.-\frac{(bc^2x^2-b)\sqrt{-d}\arctan\left(\frac{2\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}c\sqrt{-d}x}{c^4dx^4-d}\right)+2\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)}{2\,(c^4d^2x^2-c^2d^2)}\right]$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/4*((b*c^2*x^2 - b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^2 +
 4*(c^3*x^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/(c^
6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - 1)) - 4*sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x)
 + a))/(c^4*d^2*x^2 - c^2*d^2), -1/2*((b*c^2*x^2 - b)*sqrt(-d)*arctan(2*sqr
t(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*c*sqrt(-d)*x/(c^4*d*x^4 - d)) + 2*sqrt
(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a))/(c^4*d^2*x^2 - c^2*d^2)]
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x(a+b\,\mathrm{asin}\,(cx))}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)x}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] (sqrt(c*x + 1)*sqrt(-c*x + 1)*c^3*d^2*integrate(x^2/(c^4*d^2*x^4 - c^2*d^2*
x^2 + (c^2*d^2*x^2 - d^2)*e^(log(c*x + 1) + log(-c*x + 1))), x) + arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(sqrt(c*x + 1)*sqrt(-c*x + 1)*c^2*d^(3
/2)) + a/(sqrt(-c^2*d*x^2 + d)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.124 $\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 80

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{3/2}}\,dx=\frac{x(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{2cd\sqrt{d-c^2dx^2}}$$

```
[Out] x*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*ln(-c^2*x^2+1)*(-c^2*x^2+1
)^(1/2)/c/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {4745, 266}

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{3/2}}\,dx=\frac{x(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}+\frac{b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{2cd\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x]))/(d*Sqrt[d - c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]*Log[
1 - c^2*x^2])/(2*c*d*Sqrt[d - c^2*d*x^2])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
```

```
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{x(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{x}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}} \\ &= \frac{x(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2cd\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.96

$$\int \frac{a+b\arcsin(cx)}{\left(d-c^2dx^2\right)^{3/2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\left(2acx+2bcx\arcsin(cx)+b\sqrt{1-c^2x^2}\log\left(-1+c^2x^2\right)\right)}{2cd^2\left(-1+c^2x^2\right)}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^(3/2),x]
[Out] -1/2*(Sqrt[d - c^2*d*x^2]*(2*a*c*x + 2*b*c*x*ArcSin[c*x] + b*Sqrt[1 - c^2*x
^2]*Log[-1 + c^2*x^2]))/(c*d^2*(-1 + c^2*x^2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.12 (sec) , antiderivative size = 177, normalized size of antiderivative = 2.21

method	result
default	$\frac{ax}{d\sqrt{-c^2dx^2+d}} + \frac{ib\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\arcsin(cx)}{cd^2(c^2x^2-1)} - \frac{b\sqrt{-d(c^2x^2-1)}\arcsin(cx)x}{d^2(c^2x^2-1)} - \frac{b\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\ln\left(1+\left(i\right.\right.}{cd^2(c^2x^2-1)}$
parts	$\frac{ax}{d\sqrt{-c^2dx^2+d}} + \frac{ib\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\arcsin(cx)}{cd^2(c^2x^2-1)} - \frac{b\sqrt{-d(c^2x^2-1)}\arcsin(cx)x}{d^2(c^2x^2-1)} - \frac{b\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\ln\left(1+\left(i\right.\right.}{cd^2(c^2x^2-1)}$

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
[Out] a/d*x/(-c^2*d*x^2+d)^(1/2)+I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/
d^2/(c^2*x^2-1)*arcsin(c*x)-b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/d^2/(c^2*x
^2-1)*x-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d^2/(c^2*x^2-1)*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{b\arcsin(cx)+a}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")

[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(cx)}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)

[Out] Integral((a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.78

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{3/2}}\,dx = \frac{bx\arcsin(cx)}{\sqrt{-c^2dx^2+d}d} + \frac{ax}{\sqrt{-c^2dx^2+d}d} - \frac{b\log\left(x^2-\frac{1}{c^2}\right)}{2\,cd^{\frac{3}{2}}}$$

[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")

[Out] b*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a*x/(sqrt(-c^2*d*x^2 + d)*d) - 1/2*b*log(x^2 - 1/c^2)/(c*d^(3/2))

Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(d - c^2*d*x^2)^(3/2),x)
[Out] int((a + b*asin(c*x))/(d - c^2*d*x^2)^(3/2), x)
```

3.125 $\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 220

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx=\frac{a+b\arcsin(cx)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\text{arctanh}(cx)}{d\sqrt{d-c^2dx^2}}+\frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$

```
[Out] (a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(1/2)-2*(a+b*arcsin(c*x))*arctanh(I*c*x+
(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-b*arctanh(c*x
)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)+I*b*polylog(2,-I*c*x-(-c^2*x^2+
1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-I*b*polylog(2,I*c*x+(-c
^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 220, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4793, 4803, 4268, 2317, 2438, 212}

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx=-\frac{2\sqrt{1-c^2x^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}+\frac{a+b\arcsin(cx)}{d\sqrt{d-c^2dx^2}}+\frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\text{arctanh}(cx)}{d\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (a + b*ArcSin[c*x])/(d*Sqrt[d - c^2*d*x^2]) - (2*Sqrt[1 - c^2*x^2]*(a + b*A
rcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (b*Sqrt[1
 - c^2*x^2]*ArcTanh[c*x])/(d*Sqrt[d - c^2*d*x^2]) + (I*b*Sqrt[1 - c^2*x^2]*
PolyLog[2, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (I*b*Sqrt[1 - c^2
*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
```

```
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a+b\arcsin(cx)}{d\sqrt{d-c^2dx^2}}+\frac{\int \frac{a+b\arcsin(cx)}{x\sqrt{d-c^2dx^2}}\,dx}{d}-\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{1}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}\\
&= \frac{a+b\arcsin(cx)}{d\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{d\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\sqrt{1-c^2x^2}\operatorname{Subst}\left(\int (a+bx)\csc(x)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}\\
&= \frac{a+b\arcsin(cx)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}\\
&\quad-\frac{b\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{d\sqrt{d-c^2dx^2}}-\frac{\left(b\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(b\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}\\
&= \frac{a+b\arcsin(cx)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}\\
&\quad-\frac{b\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{d\sqrt{d-c^2dx^2}}+\frac{\left(ib\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(ib\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}\\
&= \frac{a+b\arcsin(cx)}{d\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}\\
&\quad-\frac{b\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{d\sqrt{d-c^2dx^2}}+\frac{ib\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}\\
&\quad-\frac{ib\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.74 (sec) , antiderivative size = 300, normalized size of antiderivative = 1.36

$$\int \frac{a+b\arcsin(cx)}{x\,(d-c^2dx^2)^{3/2}}\,dx = \frac{-\frac{a\sqrt{d-c^2dx^2}}{-1+c^2x^2}+a\sqrt{d}\log(x)-a\sqrt{d}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)+\frac{bd\left(\arcsin(cx)+\sqrt{1-c^2x^2}\,\arcsin\right.}{}}{}$$

[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^(3/2)),x]

[Out] (-((a*Sqrt[d - c^2*d*x^2])/(-1 + c^2*x^2)) + a*Sqrt[d]*Log[x] - a*Sqrt[d]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*d*(ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + I*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])] - I*Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[d - c^2*d*x^2])/d^2

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 224, normalized size of antiderivative = 1.02

method	result
default	$\frac{a}{d\sqrt{-c^2d\,x^2+d}}-\frac{a\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2d\,x^2+d}}{x}\right)}{d^{\frac{3}{2}}}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)}{d^2(c^2x^2-1)}+\frac{\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\,\left(\arcsin(cx)\ln\left(1+\right.\right.}{}\right.$
parts	$\frac{a}{d\sqrt{-c^2d\,x^2+d}}-\frac{a\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2d\,x^2+d}}{x}\right)}{d^{\frac{3}{2}}}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)}{d^2(c^2x^2-1)}+\frac{\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\,\left(\arcsin(cx)\ln\left(1+\right.\right.}{}\right.$

[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)

[Out] a/d/(-c^2*d*x^2+d)^(1/2)-a/d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+b*(-(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)+(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*arctan(I*c*x+(-c^2*x^2+1)^(1/2))-I*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-I*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2)))/d^2/(c^2*x^2-1))

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^5 - 2*c^2*d^2*
x^3 + d^2*x), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{a+b\operatorname{asin}\left(cx\right)}{x\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral((a + b*asin(c*x))/(x*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
[Out] -a*(log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^(3/2) - 1/(sq
rt(-c^2*d*x^2 + d)*d)) - b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))/((c^2*d*x^3 - d*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{x\,\left(d-c^2\,d\,x^2\right)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^(3/2)),x)
[Out] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^(3/2)), x)
```

3.126 $\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 150

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx=-\frac{a+b\arcsin(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{d-c^2dx^2}\log(x)}{d^2\sqrt{1-c^2x^2}}+\frac{bc\sqrt{d-c^2dx^2}\log\left(1-c^2x^2\right)}{2d^2\sqrt{1-c^2x^2}}$$

```
[Out] (-a-b*arcsin(c*x))/d/x/(-c^2*d*x^2+d)^(1/2)+2*c^2*x*(a+b*arcsin(c*x))/d/(-c
^2*d*x^2+d)^(1/2)+b*c*ln(x)*(-c^2*d*x^2+d)^(1/2)/d^2/(-c^2*x^2+1)^(1/2)+1/2
*b*c*ln(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {277, 197, 4779, 12, 457, 78}

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx=\frac{2c^2x(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}-\frac{a+b\arcsin(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{bc\log(x)\sqrt{d-c^2dx^2}}{d^2\sqrt{1-c^2x^2}}+\frac{bc\sqrt{d-c^2dx^2}\log\left(1-c^2x^2\right)}{2d^2\sqrt{1-c^2x^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])/(d*x*Sqrt[d - c^2*d*x^2])) + (2*c^2*x*(a + b*ArcSin[c
*x]))/(d*Sqrt[d - c^2*d*x^2]) + (b*c*Sqrt[d - c^2*d*x^2]*Log[x])/(d^2*Sqrt[
1 - c^2*x^2]) + (b*c*Sqrt[d - c^2*d*x^2]*Log[1 - c^2*x^2])/(2*d^2*Sqrt[1 -
c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\text{integral} = -\frac{a+b\arcsin(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-1+2c^2x^2}{d^2x(1-c^2x^2)}\,dx}{\sqrt{1-c^2x^2}}$$

$$=-\frac{a+b\arcsin(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-1+2c^2x^2}{x(1-c^2x^2)}\,dx}{d^2\sqrt{1-c^2x^2}}$$

$$=-\frac{a+b\arcsin(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{-1+2c^2x}{x(1-c^2x)}\,dx,x,x^2\right)}{2d^2\sqrt{1-c^2x^2}}$$

$$=-\frac{a+b\arcsin(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(-\frac{1}{x}-\frac{c^2}{-1+c^2x}\right)\,dx,x,x^2\right)}{2d^2\sqrt{1-c^2x^2}}$$

$$=-\frac{a+b\arcsin(cx)}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{d-c^2dx^2}\log(x)}{d^2\sqrt{1-c^2x^2}}+\frac{bc\sqrt{d-c^2dx^2}\log\left(1-c^2x^2\right)}{2d^2\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.41 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.14

$$\int\frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx=\frac{\sqrt{d-c^2dx^2}\left(-2a\sqrt{1-c^2x^2}+4ac^2x^2\sqrt{1-c^2x^2}+2b\sqrt{1-c^2x^2}(-1+2c^2x^2)\,\text{arcsi}\right.}{2d^2x\,(1}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(-2*a*Sqrt[1 - c^2*x^2] + 4*a*c^2*x^2*Sqrt[1 - c^2*x^2
] + 2*b*Sqrt[1 - c^2*x^2]*(-1 + 2*c^2*x^2)*ArcSin[c*x] + b*c*x*(-1 + c^2*x^
2)*Log[1 - 1/(c^2*x^2)] + 2*b*c*x*Log[1 - c^2*x^2] - 2*b*c^3*x^3*Log[1 - c^
2*x^2]))/(2*d^2*x*(1 - c^2*x^2)^(3/2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.15 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.53

method	result
default	$a\left(-\frac{1}{dx\sqrt{-c^2d\,x^2+d}}+\frac{2c^2x}{d\sqrt{-c^2d\,x^2+d}}\right)+b\left(\frac{4i\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)c}{d^2(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\left(2icx\sqrt{-c^2x^2+1}+2\right.}{(c^2x^2-1)d^2x}\right.$
parts	$a\left(-\frac{1}{dx\sqrt{-c^2d\,x^2+d}}+\frac{2c^2x}{d\sqrt{-c^2d\,x^2+d}}\right)+b\left(\frac{4i\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)c}{d^2(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\left(2icx\sqrt{-c^2x^2+1}+2\right.}{(c^2x^2-1)d^2x}\right.$

```
[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/d/x/(-c^2*d*x^2+d)^(1/2)+2*c^2/d*x/(-c^2*d*x^2+d)^(1/2))+b*(4*I*(-d*(
c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)*c-(-d*(c^2
*x^2-1))^(1/2)*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*arcsin(c*x)/(c^2*x^
2-1)/d^2/x-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2*x^2-1)*ln((I*
c*x+(-c^2*x^2+1)^(1/2))^4-1)*c)
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^6 - 2*c^2*d^2*
x^4 + d^2*x^2), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{a+b\,\mathrm{asin}\left(cx\right)}{x^2\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**2*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.86

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx=\frac{1}{2}\,bc\left(\frac{\log\left(cx+1\right)}{d^{\frac{3}{2}}}+\frac{\log\left(cx-1\right)}{d^{\frac{3}{2}}}+\frac{2\,\log\left(x\right)}{d^{\frac{3}{2}}}\right)+\left(\frac{2\,c^2x}{\sqrt{-c^2dx^2+d}d}-\frac{1}{\sqrt{-c^2dx^2+d}dx}\right)b\arcsin\left(cx\right)+\left(\frac{2\,c^2x}{\sqrt{-c^2dx^2+d}d}-\frac{1}{\sqrt{-c^2dx^2+d}dx}\right)a$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2*b*c*(log(c*x + 1)/d^(3/2) + log(c*x - 1)/d^(3/2) + 2*log(x)/d^(3/2)) +
(2*c^2*x/(sqrt(-c^2*d*x^2 + d)*d) - 1/(sqrt(-c^2*d*x^2 + d)*d*x))*b*arcsin(
c*x) + (2*c^2*x/(sqrt(-c^2*d*x^2 + d)*d) - 1/(sqrt(-c^2*d*x^2 + d)*d*x))*a
```

Giac [F]

$$\int \frac{a + b\arcsin(cx)}{x^2\left(d - c^2dx^2\right)^{3/2}}\,dx = \int \frac{b\arcsin\left(cx\right) + a}{\left(-c^2dx^2 + d\right)^{\frac{3}{2}}x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*x^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b\arcsin(cx)}{x^2\left(d - c^2dx^2\right)^{3/2}}\,dx = \int \frac{a + b\,\mathrm{asin}(c\,x)}{x^2\left(d - c^2\,d\,x^2\right)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^(3/2)),x)
[Out] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^(3/2)), x)
```

3.127 $\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 316

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^{3/2}}\,dx=-\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}}+\frac{3c^2(a+b\arcsin(cx))}{2d\sqrt{d-c^2dx^2}}-\frac{a+b\arcsin(cx)}{2dx^2\sqrt{d-c^2dx^2}}-\frac{3c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{bc^2\sqrt{1-c^2x^2}\text{arctanh}(cx)}{d\sqrt{d-c^2dx^2}}+\frac{3ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2d\sqrt{d-c^2dx^2}}-\frac{3ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2d\sqrt{d-c^2dx^2}}$$

```
[Out] 3/2*c^2*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(1/2)+1/2*(-a-b*arcsin(c*x))/d/x
^2/(-c^2*d*x^2+d)^(1/2)-1/2*b*c*(-c^2*x^2+1)^(1/2)/d/x/(-c^2*d*x^2+d)^(1/2)
-3*c^2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/
2)/d/(-c^2*d*x^2+d)^(1/2)-b*c^2*arctanh(c*x)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x
^2+d)^(1/2)+3/2*I*b*c^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(
1/2)/d/(-c^2*d*x^2+d)^(1/2)-3/2*I*b*c^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))
*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 316, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used

$= \{4789, 4793, 4803, 4268, 2317, 2438, 212, 331\}$

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^{3/2}}\,dx = -\frac{3c^2\sqrt{1-c^2x^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}} + \frac{3c^2(a+b\arcsin(cx))}{2d\sqrt{d-c^2dx^2}} - \frac{a+b\arcsin(cx)}{2dx^2\sqrt{d-c^2dx^2}} + \frac{3ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2d\sqrt{d-c^2dx^2}} - \frac{3ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2d\sqrt{d-c^2dx^2}} - \frac{bc^2\sqrt{1-c^2x^2}\text{arctanh}(cx)}{d\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -1/2*(b*c*Sqrt[1 - c^2*x^2])/(d*x*Sqrt[d - c^2*d*x^2]) + (3*c^2*(a + b*ArcS
in[c*x]))/(2*d*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x])/(2*d*x^2*Sqrt[d -
 c^2*d*x^2]) - (3*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*Ar
cSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (b*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[c*x
])/(d*Sqrt[d - c^2*d*x^2]) + (((3*I)/2)*b*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2,
-E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (((3*I)/2)*b*c^2*Sqrt[1 - c^
2*x^2]*PolyLog[2, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\text{integral} = -\frac{a+b\arcsin(cx)}{2dx^2\sqrt{d-c^2dx^2}}+\frac{1}{2}\left(3c^2\right)\int\frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int\frac{1}{x^2(1-c^2x^2)}\,dx}{2d\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}} + \frac{3c^2(a+b\arcsin(cx))}{2d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{a+b\arcsin(cx)}{2dx^2\sqrt{d-c^2dx^2}} + \frac{(3c^2)\int \frac{a+b\arcsin(cx)}{x\sqrt{d-c^2dx^2}}\,dx}{2d} \\
&\quad + \frac{\left(bc^3\sqrt{1-c^2x^2}\right)\int \frac{1}{1-c^2x^2}\,dx}{2d\sqrt{d-c^2dx^2}} - \frac{\left(3bc^3\sqrt{1-c^2x^2}\right)\int \frac{1}{1-c^2x^2}\,dx}{2d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}} + \frac{3c^2(a+b\arcsin(cx))}{2d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{a+b\arcsin(cx)}{2dx^2\sqrt{d-c^2dx^2}} - \frac{bc^2\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(3c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \arcsin(cx)\right)}{2d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}} + \frac{3c^2(a+b\arcsin(cx))}{2d\sqrt{d-c^2dx^2}} - \frac{a+b\arcsin(cx)}{2dx^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{3c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{bc^2\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(3bc^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{2d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(3bc^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{2d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}} + \frac{3c^2(a+b\arcsin(cx))}{2d\sqrt{d-c^2dx^2}} - \frac{a+b\arcsin(cx)}{2dx^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{3c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{bc^2\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(3ibc^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(3ibc^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{bc\sqrt{1-c^2x^2}}{2dx\sqrt{d-c^2dx^2}} + \frac{3c^2(a+b\arcsin(cx))}{2d\sqrt{d-c^2dx^2}} - \frac{a+b\arcsin(cx)}{2dx^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{3c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{bc^2\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{d\sqrt{d-c^2dx^2}} + \frac{3ibc^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2, -e^{i\arcsin(cx)}\right)}{2d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{3ibc^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2, e^{i\arcsin(cx)}\right)}{2d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.63 (sec) , antiderivative size = 404, normalized size of antiderivative = 1.28

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{\frac{4a\sqrt{d}(-1+3c^2x^2)}{x^2\sqrt{d-c^2dx^2}}+12ac^2\log(x)-12ac^2\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)+\frac{b\sqrt{d}\left(2\arcsin(cx)-6\operatorname{ar}\ldots\right.}{\ldots}}{\ldots}$$

[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^(3/2)),x]

[Out] ((4*a*Sqrt[d]*(-1 + 3*c^2*x^2))/(x^2*Sqrt[d - c^2*d*x^2]) + 12*a*c^2*Log[x] - 12*a*c^2*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (b*Sqrt[d]*(2*ArcSin[c*x] - 6*ArcSin[c*x]*Cos[2*ArcSin[c*x]] - 3*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 - E^(I*ArcSin[c*x])] + 3*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + E^(I*ArcSin[c*x])] - 2*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + Sqrt[1 - c^2*x^2]*(3*ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) + 2*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])) + 2*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 2*Sin[2*ArcSin[c*x]] + (6*I)*c*x*PolyLog[2, -E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] - (6*I)*c*x*PolyLog[2, E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]]))/(x^2*Sqrt[d - c^2*d*x^2]))/(8*d^(3/2))

Maple [A] (verified)

Time = 0.21 (sec) , antiderivative size = 425, normalized size of antiderivative = 1.34

method	result
default	$a\left(-\frac{1}{2d\,x^2\sqrt{-c^2d\,x^2+d}}+\frac{3c^2\left(\frac{1}{d\sqrt{-c^2d\,x^2+d}}-\frac{\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2d\,x^2+d}}{x}\right)}{d^{\frac{3}{2}}}\right)}{2}\right)-\frac{ib\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\left(3i\arcsin(cx)\ln\left(1\ldots\right.\right.}{\ldots}$
parts	$a\left(-\frac{1}{2d\,x^2\sqrt{-c^2d\,x^2+d}}+\frac{3c^2\left(\frac{1}{d\sqrt{-c^2d\,x^2+d}}-\frac{\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2d\,x^2+d}}{x}\right)}{d^{\frac{3}{2}}}\right)}{2}\right)-\frac{ib\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\left(3i\arcsin(cx)\ln\left(1\ldots\right.\right.}{\ldots}$

[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)

[Out] a*(-1/2/d/x^2/(-c^2*d*x^2+d)^(1/2)+3/2*c^2*(1/d/(-c^2*d*x^2+d)^(1/2)-1/d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)))-1/2*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(3*I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))*x^4*c^4+3*dilog(I*c*x+(-c^2*x^2+1)^(1/2))*c^4*x^4+4*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*c^4*x^4+3*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))*c^4*x^4+3*I*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^2*x^2-3*I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))*x

```
^2*c^2+I*x^3*c^3-3*dilog(I*c*x+(-c^2*x^2+1)^(1/2))*c^2*x^2-4*arctan(I*c*x+(
-c^2*x^2+1)^(1/2))*c^2*x^2-3*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))*c^2*x^2-I*(-
c^2*x^2+1)^(1/2)*arcsin(c*x)-I*c*x)/d^2/(c^4*x^4-2*c^2*x^2+1)/x^2
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^{3/2}}\,dx=\int \frac{b\arcsin(cx)+a}{(-c^2dx^2+d)^{\frac{3}{2}}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^7 - 2*c^2*d^2*
x^5 + d^2*x^3), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^{3/2}}\,dx=\int \frac{a+b\operatorname{asin}(cx)}{x^3(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral((a + b*asin(c*x))/(x**3*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^{3/2}}\,dx=\int \frac{b\arcsin(cx)+a}{(-c^2dx^2+d)^{\frac{3}{2}}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
[Out] -1/2*(3*c^2*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^(3/2)
 - 3*c^2/(sqrt(-c^2*d*x^2 + d)*d) + 1/(sqrt(-c^2*d*x^2 + d)*d*x^2))*a - b*i
ntegrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^2*d*x^5 - d*x^3)*sq
rt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^{3/2}}\,dx = \int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*x^3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^{3/2}}\,dx = \int \frac{a+b\operatorname{asin}(c\,x)}{x^3\left(d-c^2\,d\,x^2\right)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^(3/2)),x)
[Out] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^(3/2)), x)
```

3.128 $\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 238

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx=-\frac{bc\sqrt{d-c^2dx^2}}{6d^2x^2\sqrt{1-c^2x^2}}-\frac{a+b\arcsin(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2(a+b\arcsin(cx))}{3dx\sqrt{d-c^2dx^2}}+\frac{8c^4x(a+b\arcsin(cx))}{3d\sqrt{d-c^2dx^2}}+\frac{5bc^3\sqrt{d-c^2dx^2}\log(x)}{3d^2\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-c^2dx^2}\log\left(1-c^2x^2\right)}{2d^2\sqrt{1-c^2x^2}}$$

```
[Out] 1/3*(-a-b*arcsin(c*x))/d/x^3/(-c^2*d*x^2+d)^(1/2)-4/3*c^2*(a+b*arcsin(c*x))
/d/x/(-c^2*d*x^2+d)^(1/2)+8/3*c^4*x*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(1/2
)-1/6*b*c*(-c^2*d*x^2+d)^(1/2)/d^2/x^2/(-c^2*x^2+1)^(1/2)+5/3*b*c^3*ln(x)*(
-c^2*d*x^2+d)^(1/2)/d^2/(-c^2*x^2+1)^(1/2)+1/2*b*c^3*ln(-c^2*x^2+1)*(-c^2*d
*x^2+d)^(1/2)/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {277, 197, 4779, 12, 1265, 907}

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx=-\frac{4c^2(a+b\arcsin(cx))}{3dx\sqrt{d-c^2dx^2}}-\frac{a+b\arcsin(cx)}{3dx^3\sqrt{d-c^2dx^2}}+\frac{8c^4x(a+b\arcsin(cx))}{3d\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{d-c^2dx^2}}{6d^2x^2\sqrt{1-c^2x^2}}+\frac{5bc^3\log(x)\sqrt{d-c^2dx^2}}{3d^2\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-c^2dx^2}\log\left(1-c^2x^2\right)}{2d^2\sqrt{1-c^2x^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -1/6*(b*c*Sqrt[d - c^2*d*x^2])/(d^2*x^2*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[
c*x])/(3*d*x^3*Sqrt[d - c^2*d*x^2]) - (4*c^2*(a + b*ArcSin[c*x]))/(3*d*x*Sq
rt[d - c^2*d*x^2]) + (8*c^4*x*(a + b*ArcSin[c*x]))/(3*d*Sqrt[d - c^2*d*x^2]
) + (5*b*c^3*Sqrt[d - c^2*d*x^2]*Log[x])/(3*d^2*Sqrt[1 - c^2*x^2]) + (b*c^3
*Sqrt[d - c^2*d*x^2]*Log[1 - c^2*x^2])/(2*d^2*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{a+b\arcsin(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2(a+b\arcsin(cx))}{3dx\sqrt{d-c^2dx^2}} \\ &\quad+\frac{8c^4x(a+b\arcsin(cx))}{3d\sqrt{d-c^2dx^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-1-4c^2x^2+8c^4x^4}{3d^2x^3(1-c^2x^2)}\,dx}{\sqrt{1-c^2x^2}} \\ &= -\frac{a+b\arcsin(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2(a+b\arcsin(cx))}{3dx\sqrt{d-c^2dx^2}} \\ &\quad+\frac{8c^4x(a+b\arcsin(cx))}{3d\sqrt{d-c^2dx^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-1-4c^2x^2+8c^4x^4}{x^3(1-c^2x^2)}\,dx}{3d^2\sqrt{1-c^2x^2}} \\ &= -\frac{a+b\arcsin(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2(a+b\arcsin(cx))}{3dx\sqrt{d-c^2dx^2}}+\frac{8c^4x(a+b\arcsin(cx))}{3d\sqrt{d-c^2dx^2}} \\ &\quad-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{-1-4c^2x+8c^4x^2}{x^2(1-c^2x)}\,dx,x,x^2\right)}{6d^2\sqrt{1-c^2x^2}} \\ &= -\frac{a+b\arcsin(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2(a+b\arcsin(cx))}{3dx\sqrt{d-c^2dx^2}}+\frac{8c^4x(a+b\arcsin(cx))}{3d\sqrt{d-c^2dx^2}} \\ &\quad-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(-\frac{1}{x^2}-\frac{5c^2}{x}-\frac{3c^4}{-1+c^2x}\right)dx,x,x^2\right)}{6d^2\sqrt{1-c^2x^2}} \\ &= -\frac{bc\sqrt{d-c^2dx^2}}{6d^2x^2\sqrt{1-c^2x^2}}-\frac{a+b\arcsin(cx)}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2(a+b\arcsin(cx))}{3dx\sqrt{d-c^2dx^2}} \\ &\quad+\frac{8c^4x(a+b\arcsin(cx))}{3d\sqrt{d-c^2dx^2}}+\frac{5bc^3\sqrt{d-c^2dx^2}\log(x)}{3d^2\sqrt{1-c^2x^2}}+\frac{bc^3\sqrt{d-c^2dx^2}\log\left(1-c^2x^2\right)}{2d^2\sqrt{1-c^2x^2}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.59 (sec) , antiderivative size = 224, normalized size of antiderivative = 0.94

$$\int\frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx=$$

$$-\frac{\sqrt{d-c^2dx^2}\left(bcx-bc^3x^3+2a\sqrt{1-c^2x^2}+8ac^2x^2\sqrt{1-c^2x^2}-16ac^4x^4\sqrt{1-c^2x^2}-2b\sqrt{1-c^2x^2}(-1-4c\right.}{6d^2x^3\left(1\right.}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -1/6*(Sqrt[d - c^2*d*x^2]*(b*c*x - b*c^3*x^3 + 2*a*Sqrt[1 - c^2*x^2] + 8*a*
c^2*x^2*Sqrt[1 - c^2*x^2] - 16*a*c^4*x^4*Sqrt[1 - c^2*x^2] - 2*b*Sqrt[1 - c
^2*x^2]*(-1 - 4*c^2*x^2 + 8*c^4*x^4)*ArcSin[c*x] - 5*b*c^3*x^3*(-1 + c^2*x^
2)*Log[1 - 1/(c^2*x^2)] - 8*b*c^3*x^3*Log[1 - c^2*x^2] + 8*b*c^5*x^5*Log[1
- c^2*x^2]))/(d^2*x^3*(1 - c^2*x^2)^(3/2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.21 (sec) , antiderivative size = 1048, normalized size of antiderivative = 4.40

method	result	size
default	Expression too large to display	1048
parts	Expression too large to display	1048

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/3/d/x^3/(-c^2*d*x^2+d)^(1/2)+4/3*c^2*(-1/d/x/(-c^2*d*x^2+d)^(1/2)+2*c
^2/d*x/(-c^2*d*x^2+d)^(1/2)))+4*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2
*x^2-1)/d^2*x^3*c^6+32/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)
/d^2*x^5*(-c^2*x^2+1)*c^8-64/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*
x^2-1)/d^2*x^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5-16/3*I*b*(-d*(c^2*x^2-1))
^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*(-c^2*x^2+1)*c^6-4/3*I*b*(-d*(c^2*x^
2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*(-c^2*x^2+1)*c^4-16*I*b*(-d*(c^2*
x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^5*c^8-64/3*b*(-d*(c^2*x^2-1))^(
1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*arcsin(c*x)*c^6-8/3*I*b*(-d*(c^2*x^2-1
))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3+32/
3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^7*c^10+4/3*I*b*(
-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*c^4+8*b*(-d*(c^2*x^2-1)
)^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*arcsin(c*x)*c^4+16/3*I*b*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)*c^3+4/3*b*(-d*(c^
2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*c^3*(-c^2*x^2+1)^(1/2)+4*b*(-d*
(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x*arcsin(c*x)*c^2+1/6*b*(-d*
(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x^2*(-c^2*x^2+1)^(1/2)*c+1/3
*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x^3*arcsin(c*x)-5/3*b
*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2*x^2-1)*ln((I*c*x+(-c^2*
x^2+1)^(1/2))^2-1)*c^3-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2
*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c^3
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*x^8 - 2*c^2*d^2*
x^6 + d^2*x^4), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{a+b\operatorname{asin}{(cx)}}{x^4\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral((a + b*asin(c*x))/(x**4*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
[Out] 1/3*(8*c^4*x/(sqrt(-c^2*d*x^2 + d)*d) - 4*c^2/(sqrt(-c^2*d*x^2 + d)*d*x) -
1/(sqrt(-c^2*d*x^2 + d)*d*x^3))*a - b*integrate(arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))/((c^2*d*x^6 - d*x^4)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt
(d)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*x^4), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{a+b\,\mathrm{asin}\left(c\,x\right)}{x^4\,{\left(d-c^2\,d\,x^2\right)}^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^(3/2)),x)
[Out] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^(3/2)), x)
```

3.129 $\int \frac{x^6(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 293

$$\int \frac{x^6(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{b}{6c^7d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{bx^2\sqrt{1-c^2x^2}}{4c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^5(a+b\arcsin(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}}-\frac{5x^3(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{5x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^6d^3} + \frac{5\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^7d^2\sqrt{d-c^2dx^2}}-\frac{7b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{6c^7d^2\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*x^5*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(3/2)-5/3*x^3*(a+b*arcsin(c*
x))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/6*b/c^7/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x
^2+d)^(1/2)+1/4*b*x^2*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)+5/4*(
a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c^7/d^2/(-c^2*d*x^2+d)^(1/2)-7/6*b*
ln(-c^2*x^2+1)*(-c^2*x^2+1)^(1/2)/c^7/d^2/(-c^2*d*x^2+d)^(1/2)-5/2*x*(a+b*a
rcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^6/d^3
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 293, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4791, 4795, 4737, 30, 272, 45}

$$\int \frac{x^6(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{x^5(a+b\arcsin(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}}+\frac{5\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^7d^2\sqrt{d-c^2dx^2}} -\frac{5x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^6d^3}-\frac{5x^3(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} -\frac{b}{6c^7d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{7b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{6c^7d^2\sqrt{d-c^2dx^2}}+\frac{bx^2\sqrt{1-c^2x^2}}{4c^5d^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^6*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*b/(c^7*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (b*x^2*Sqrt[1 - c^
2*x^2])/(4*c^5*d^2*Sqrt[d - c^2*d*x^2]) + (x^5*(a + b*ArcSin[c*x]))/(3*c^2*
d*(d - c^2*d*x^2)^(3/2)) - (5*x^3*(a + b*ArcSin[c*x]))/(3*c^4*d^2*Sqrt[d -
c^2*d*x^2]) - (5*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2*c^6*d^3) + (
5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c^7*d^2*Sqrt[d - c^2*d*x^2]
) - (7*b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(6*c^7*d^2*Sqrt[d - c^2*d*x^2]
)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = \frac{x^5(a+b\arcsin(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{5\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx}{3c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^5}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= \frac{x^5(a+b\arcsin(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{5x^3(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{5\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx}{c^4d^2} + \frac{\left(5b\sqrt{1-c^2x^2}\right)\int \frac{x^3}{1-c^2x^2}\,dx}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{x^2}{(1-c^2x)^2}\,dx, x, x^2\right)}{6cd^2\sqrt{d-c^2dx^2}}$$

$$= \frac{x^5(a+b\arcsin(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{5x^3(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{5x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^6d^3} + \frac{5\int \frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}}\,dx}{2c^6d^2} + \frac{\left(5b\sqrt{1-c^2x^2}\right)\int x\,dx}{2c^5d^2\sqrt{d-c^2dx^2}} + \frac{\left(5b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{x}{1-c^2x}\,dx, x, x^2\right)}{6c^3d^2\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \left(\frac{1}{c^4} + \frac{1}{c^4(-1+c^2x)^2} + \frac{2}{c^4(-1+c^2x)}\right)dx, x, x^2\right)}{6cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b}{6c^7d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{13bx^2\sqrt{1-c^2x^2}}{12c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^5(a+b\arcsin(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{5x^3(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{5x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^6d^3} + \frac{5\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^7d^2\sqrt{d-c^2dx^2}} - \frac{b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{3c^7d^2\sqrt{d-c^2dx^2}} + \frac{\left(5b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \left(-\frac{1}{c^2} - \frac{1}{c^2(-1+c^2x)}\right)dx, x, x^2\right)}{6c^3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b}{6c^7d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{bx^2\sqrt{1-c^2x^2}}{4c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^5(a+b\arcsin(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{5x^3(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{5x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^6d^3} + \frac{5\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^7d^2\sqrt{d-c^2dx^2}} - \frac{7b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{6c^7d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 253, normalized size of antiderivative = 0.86

$$\int \frac{x^6(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{4bc\sqrt{d}x(15-20c^2x^2+3c^4x^4)\arcsin(cx) - 30b\sqrt{d}(1-c^2x^2)^{3/2}\arcsin(cx)^2 - 6}{}$$

```
[In] Integrate[(x^6*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (4*b*c*Sqrt[d]*x*(15 - 20*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x] - 30*b*Sqrt[d]*(
1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2 - 60*a*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2]*
ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + Sqrt[d]*(4*a*c
*x*(15 - 20*c^2*x^2 + 3*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(7 - 9*c^2*x^2 + 6*c
^4*x^4) + 28*b*(1 - c^2*x^2)^(3/2)*Log[1 - c^2*x^2]))/(24*c^7*d^(5/2)*(-1 +
 c^2*x^2)*Sqrt[d - c^2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.23 (sec) , antiderivative size = 426, normalized size of antiderivative = 1.45

method	result
default	$-\frac{a\,x^5}{2c^2d(-c^2d\,x^2+d)^{\frac{3}{2}}} + \frac{5a\,x^3}{6c^4d(-c^2d\,x^2+d)^{\frac{3}{2}}} - \frac{5ax}{2c^6d^2\sqrt{-c^2d\,x^2+d}} + \frac{5a\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^6d^2\sqrt{c^2d}} - \frac{b\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}}{}$
parts	$-\frac{a\,x^5}{2c^2d(-c^2d\,x^2+d)^{\frac{3}{2}}} + \frac{5a\,x^3}{6c^4d(-c^2d\,x^2+d)^{\frac{3}{2}}} - \frac{5ax}{2c^6d^2\sqrt{-c^2d\,x^2+d}} + \frac{5a\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^6d^2\sqrt{c^2d}} - \frac{b\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}}{}$

```
[In] int(x^6*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a*x^5/c^2/d/(-c^2*d*x^2+d)^(3/2)+5/6*a/c^4*x^3/d/(-c^2*d*x^2+d)^(3/2)-
5/2*a/c^6/d^2*x/(-c^2*d*x^2+d)^(1/2)+5/2*a/c^6/d^2/(c^2*d)^(1/2)*arctan((c^
2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/24*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+
1)^(1/2)*(-12*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5*x^5+6*c^6*x^6+30*arcsin(c*
x)^2*x^4*c^4+56*I*arcsin(c*x)*x^4*c^4-56*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)
*x^4*c^4+80*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3*x^3-15*c^4*x^4-60*arcsin(c*x
```

```
)^2*x^2*c^2+56*I*arcsin(c*x)+112*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*x^2*c^2
-60*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c+16*c^2*x^2+30*arcsin(c*x)^2-112*I*ar
csin(c*x)*x^2*c^2-56*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-7)/d^3/(c^6*x^6-3*c
^4*x^4+3*c^2*x^2-1)/c^7
```

Fricas [F]

$$\int \frac{x^6(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(b\arcsin(cx)+a)x^6}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^6*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^6*arcsin(c*x) + a*x^6)*sqrt(-c^2*d*x^2 + d)/(c^6*d^3*x^6 - 3
*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{x^6(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{x^6(a+b\,\mathrm{asin}\,(cx))}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x**6*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**6*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{x^6(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(b\arcsin(cx)+a)x^6}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^6*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/6*a*(3*x^5/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 5*x*(3*x^2/((-c^2*d*x^2 + d)
^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d))/c^2 + 5*x/(sqrt(-c^2*d*x^
2 + d)*c^6*d^2) - 15*arcsin(c*x)/(c^7*d^(5/2))) + b*integrate(x^6*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt
(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^6(a + b \arcsin(cx))}{(d - c^2dx^2)^{5/2}} \, dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^6*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^6(a + b \arcsin(cx))}{(d - c^2dx^2)^{5/2}} \, dx = \int \frac{x^6 \, (a + b \, \mathrm{asin}(c \, x))}{(d - c^2 \, d \, x^2)^{5/2}} \, dx$$

```
[In] int((x^6*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((x^6*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.130 $\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 219

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{bx\sqrt{d-c^2dx^2}}{6c^5d^3(1-c^2x^2)^{3/2}}+\frac{bx\sqrt{d-c^2dx^2}}{c^5d^3\sqrt{1-c^2x^2}}+\frac{a+b\arcsin(cx)}{3c^6d(d-c^2dx^2)^{3/2}} - \frac{2(a+b\arcsin(cx))}{c^6d^2\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^6d^3}+\frac{11b\sqrt{d-c^2dx^2}\text{arctanh}(cx)}{6c^6d^3\sqrt{1-c^2x^2}}$$

```
[Out] 1/3*(a+b*arcsin(c*x))/c^6/d/(-c^2*d*x^2+d)^(3/2)-2*(a+b*arcsin(c*x))/c^6/d^
2/(-c^2*d*x^2+d)^(1/2)-1/6*b*x*(-c^2*d*x^2+d)^(1/2)/c^5/d^3/(-c^2*x^2+1)^(3
/2)-(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^6/d^3+b*x*(-c^2*d*x^2+d)^(1/2)
/c^5/d^3/(-c^2*x^2+1)^(1/2)+11/6*b*arctanh(c*x)*(-c^2*d*x^2+d)^(1/2)/c^6/d^
3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 219, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {272, 45, 4779, 12, 1171, 396, 212}

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^6d^3}-\frac{2(a+b\arcsin(cx))}{c^6d^2\sqrt{d-c^2dx^2}} +\frac{a+b\arcsin(cx)}{3c^6d(d-c^2dx^2)^{3/2}}+\frac{11b\text{arctanh}(cx)\sqrt{d-c^2dx^2}}{6c^6d^3\sqrt{1-c^2x^2}}+\frac{bx\sqrt{d-c^2dx^2}}{c^5d^3\sqrt{1-c^2x^2}}-\frac{bx\sqrt{d-c^2dx^2}}{6c^5d^3(1-c^2x^2)^{3/2}}$$

```
[In] Int[(x^5*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*(b*x*Sqrt[d - c^2*d*x^2])/(c^5*d^3*(1 - c^2*x^2)^(3/2)) + (b*x*Sqrt[d
- c^2*d*x^2])/(c^5*d^3*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(3*c^6*d*(d
```

```
- c^2*d*x^2)^(3/2)) - (2*(a + b*ArcSin[c*x]))/(c^6*d^2*Sqrt[d - c^2*d*x^2]
) - (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(c^6*d^3) + (11*b*Sqrt[d - c^
2*d*x^2]*ArcTanh[c*x])/(6*c^6*d^3*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 1171

```
Int[((d_) + (e_.)*(x_)^2)^(q_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 + c*x^4)^p, d + e*x^2
, x], R = Coeff[PolynomialRemainder[(a + b*x^2 + c*x^4)^p, d + e*x^2, x], x
, 0]}, Simp[(-R)*x*((d + e*x^2)^(q + 1)/(2*d*(q + 1))), x] + Dist[1/(2*d*(q
 + 1)), Int[(d + e*x^2)^(q + 1)*ExpandToSum[2*d*(q + 1)*Qx + R*(2*q + 3), x
], x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2
 - b*d*e + a*e^2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a+b\arcsin(cx)}{3c^6d\left(d-c^2dx^2\right)^{3/2}}-\frac{2(a+b\arcsin(cx))}{c^6d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^6d^3}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-8+12c^2x^2-3c^4x^4}{3c^6d^3\left(1-c^2x^2\right)^2}\,dx}{\sqrt{1-c^2x^2}}\\
&=\frac{a+b\arcsin(cx)}{3c^6d\left(d-c^2dx^2\right)^{3/2}}-\frac{2(a+b\arcsin(cx))}{c^6d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^6d^3}-\frac{\left(b\sqrt{d-c^2dx^2}\right)\int\frac{-8+12c^2x^2-3c^4x^4}{\left(1-c^2x^2\right)^2}\,dx}{3c^5d^3\sqrt{1-c^2x^2}}\\
&=-\frac{bx\sqrt{d-c^2dx^2}}{6c^5d^3\left(1-c^2x^2\right)^{3/2}}+\frac{a+b\arcsin(cx)}{3c^6d\left(d-c^2dx^2\right)^{3/2}}-\frac{2(a+b\arcsin(cx))}{c^6d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^6d^3}+\frac{\left(b\sqrt{d-c^2dx^2}\right)\int\frac{17-6c^2x^2}{1-c^2x^2}\,dx}{6c^5d^3\sqrt{1-c^2x^2}}\\
&=-\frac{bx\sqrt{d-c^2dx^2}}{6c^5d^3\left(1-c^2x^2\right)^{3/2}}+\frac{bx\sqrt{d-c^2dx^2}}{c^5d^3\sqrt{1-c^2x^2}}+\frac{a+b\arcsin(cx)}{3c^6d\left(d-c^2dx^2\right)^{3/2}}-\frac{2(a+b\arcsin(cx))}{c^6d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^6d^3}+\frac{\left(11b\sqrt{d-c^2dx^2}\right)\int\frac{1}{1-c^2x^2}\,dx}{6c^5d^3\sqrt{1-c^2x^2}}\\
&=-\frac{bx\sqrt{d-c^2dx^2}}{6c^5d^3\left(1-c^2x^2\right)^{3/2}}+\frac{bx\sqrt{d-c^2dx^2}}{c^5d^3\sqrt{1-c^2x^2}}+\frac{a+b\arcsin(cx)}{3c^6d\left(d-c^2dx^2\right)^{3/2}}-\frac{2(a+b\arcsin(cx))}{c^6d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^6d^3}+\frac{11b\sqrt{d-c^2dx^2}\operatorname{arctanh}(cx)}{6c^6d^3\sqrt{1-c^2x^2}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

Time = 0.24 (sec) , antiderivative size = 169, normalized size of antiderivative = 0.77

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{\sqrt{d-c^2dx^2}\left(\sqrt{-c^2}\left(bcx\sqrt{1-c^2x^2}(-5+6c^2x^2)+2a(8-12c^2x^2+3c^4x^4)+2b\right.\right.}{6c^4\left(-c^2\right)^{\frac{3}{2}}}$$

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(Sqrt[-c^2]*(b*c*x*Sqrt[1 - c^2*x^2]*(-5 + 6*c^2*x^2)
+ 2*a*(8 - 12*c^2*x^2 + 3*c^4*x^4) + 2*b*(8 - 12*c^2*x^2 + 3*c^4*x^4)*ArcSi
n[c*x]) + (11*I)*b*c*(1 - c^2*x^2)^(3/2)*EllipticF[I*ArcSinh[Sqrt[-c^2]*x],
 1]))/(6*c^4*(-c^2)^(3/2)*d^3*(-1 + c^2*x^2)^2)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.34 (sec) , antiderivative size = 414, normalized size of antiderivative = 1.89

method	result
default	$a\left(-\frac{x^4}{c^2d(-c^2dx^2+d)^{\frac{3}{2}}}+\frac{\frac{4x^2}{c^2d\left(-c^2dx^2+d\right)^{\frac{3}{2}}}-\frac{8}{3dc^4\left(-c^2dx^2+d\right)^{\frac{3}{2}}}}{c^2}\right)+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(c^2x^2-icx\sqrt{-c^2x^2+1}-1\right)(\arcsin\right.}{2c^6d^3(c^2x^2-1)}$
parts	$a\left(-\frac{x^4}{c^2d(-c^2dx^2+d)^{\frac{3}{2}}}+\frac{\frac{4x^2}{c^2d\left(-c^2dx^2+d\right)^{\frac{3}{2}}}-\frac{8}{3dc^4\left(-c^2dx^2+d\right)^{\frac{3}{2}}}}{c^2}\right)+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(c^2x^2-icx\sqrt{-c^2x^2+1}-1\right)(\arcsin\right.}{2c^6d^3(c^2x^2-1)}$

```
[In] int(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-x^4/c^2/d/(-c^2*d*x^2+d)^(3/2)+4/c^2*(x^2/c^2/d/(-c^2*d*x^2+d)^(3/2)-2/
3/d/c^4/(-c^2*d*x^2+d)^(3/2)))+b*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-
c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^6/d^3/(c^2*x^2-1)-1/2*(-d*(c^2*x^
2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^6/d^3/(c
^2*x^2-1)+1/6*(-d*(c^2*x^2-1))^(1/2)*(12*c^2*x^2*arcsin(c*x)-c*x*(-c^2*x^2+
1)^(1/2)-10*arcsin(c*x))/c^6/(c^2*x^2-1)^2/d^3+11/6*(-d*(c^2*x^2-1))^(1/2)*
(-c^2*x^2+1)^(1/2)/c^6/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)-11/6*
(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^6/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^
2*x^2+1)^(1/2)+I))
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 481, normalized size of antiderivative = 2.20

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \left[\frac{11\,(bc^4x^4-2\,bc^2x^2+b)\sqrt{d}\log\left(-\frac{c^6dx^6+5\,c^4dx^4-5\,c^2dx^2-4\,(c^3x^3+cx)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2-}}{c^6x^6-3\,c^4x^4+3\,c^2x^2-1}\right.}{}\right.$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/24*(11*(b*c^4*x^4 - 2*b*c^2*x^2 + b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x
^4 - 5*c^2*d*x^2 - 4*(c^3*x^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1
)*sqrt(d) - d)/(c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - 1)) - 4*(6*b*c^3*x^3 - 5*
b*c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) - 8*(3*a*c^4*x^4 - 12*a*c^2*
x^2 + (3*b*c^4*x^4 - 12*b*c^2*x^2 + 8*b)*arcsin(c*x) + 8*a)*sqrt(-c^2*d*x^2
 + d))/(c^10*d^3*x^4 - 2*c^8*d^3*x^2 + c^6*d^3), 1/12*(11*(b*c^4*x^4 - 2*b*
c^2*x^2 + b)*sqrt(-d)*arctan(2*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*c*sq
rt(-d)*x/(c^4*d*x^4 - d)) - 2*(6*b*c^3*x^3 - 5*b*c*x)*sqrt(-c^2*d*x^2 + d)*
sqrt(-c^2*x^2 + 1) - 4*(3*a*c^4*x^4 - 12*a*c^2*x^2 + (3*b*c^4*x^4 - 12*b*c^
2*x^2 + 8*b)*arcsin(c*x) + 8*a)*sqrt(-c^2*d*x^2 + d))/(c^10*d^3*x^4 - 2*c^8
*d^3*x^2 + c^6*d^3)]
```

Sympy [F]

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^5(a+b\,\mathrm{asin}\,(cx))}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x**5*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**5*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)x^5}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/3*a*(3*x^4/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 12*x^2/((-c^2*d*x^2 + d)^(3/
2)*c^4*d) + 8/((-c^2*d*x^2 + d)^(3/2)*c^6*d)) + 1/3*(3*(c^8*d^3*x^2 - c^6*d
^3)*sqrt(c*x + 1)*sqrt(-c*x + 1)*sqrt(d)*integrate(1/3*(3*c^4*x^6 - 12*c^2*
x^4 + 8*x^2)/(c^9*d^3*x^6 - 2*c^7*d^3*x^4 + c^5*d^3*x^2 + (c^7*d^3*x^4 - 2*
c^5*d^3*x^2 + c^3*d^3)*e^(log(c*x + 1) + log(-c*x + 1))), x) + (3*c^4*x^4 -
 12*c^2*x^2 + 8)*sqrt(d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/((c^
8*d^3*x^2 - c^6*d^3)*sqrt(c*x + 1)*sqrt(-c*x + 1))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^5(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^5\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int((x^5*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((x^5*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.131 $\int \frac{x^4(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 212

$$\int \frac{x^4(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{5/2}}\,dx=-\frac{b}{6c^5d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\arcsin(cx))}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{x(a+b\arcsin(cx))}{c^4d^2\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^5d^2\sqrt{d-c^2dx^2}}-\frac{2b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{3c^5d^2\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*x^3*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(3/2)-x*(a+b*arcsin(c*x))/c^
4/d^2/(-c^2*d*x^2+d)^(1/2)-1/6*b/c^5/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^
(1/2)+1/2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c^5/d^2/(-c^2*d*x^2+d)^(
1/2)-2/3*b*ln(-c^2*x^2+1)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 212, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {4791, 4737, 266, 272, 45}

$$\int \frac{x^4(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{5/2}}\,dx=\frac{x^3(a+b\arcsin(cx))}{3c^2d\left(d-c^2dx^2\right)^{3/2}}+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^5d^2\sqrt{d-c^2dx^2}}-\frac{x(a+b\arcsin(cx))}{c^4d^2\sqrt{d-c^2dx^2}}-\frac{b}{6c^5d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{2b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{3c^5d^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*b/(c^5*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin
[c*x]))/(3*c^2*d*(d - c^2*d*x^2)^(3/2)) - (x*(a + b*ArcSin[c*x]))/(c^4*d^2*
```

```
Sqrt[d - c^2*d*x^2]) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c^5*d
^2*Sqrt[d - c^2*d*x^2]) - (2*b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(3*c^5*d
^2*Sqrt[d - c^2*d*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\text{integral} = \frac{x^3(a+b\arcsin(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx}{c^2d} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^3}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= \frac{x^3(a+b\arcsin(cx))}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{x(a+b\arcsin(cx))}{c^4d^2\sqrt{d-c^2dx^2}} + \frac{\int \frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}}\,dx}{c^4d^2} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x}{1-c^2x^2}\,dx}{c^3d^2\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{x}{(1-c^2x)^2}\,dx,x,x^2\right)}{6cd^2\sqrt{d-c^2dx^2}}$$

$$= \frac{x^3(a+b\arcsin(cx))}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{x(a+b\arcsin(cx))}{c^4d^2\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^5d^2\sqrt{d-c^2dx^2}} - \frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2c^5d^2\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \left(\frac{1}{c^2(-1+c^2x)^2}+\frac{1}{c^2(-1+c^2x)}\right)dx,x,x^2\right)}{6cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b}{6c^5d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{x(a+b\arcsin(cx))}{c^4d^2\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^5d^2\sqrt{d-c^2dx^2}} - \frac{2b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{3c^5d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 213, normalized size of antiderivative = 1.00

$$\int \frac{x^4(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{-3b\sqrt{d}\left(1-c^2x^2\right)^{3/2}\arcsin(cx)^2 - 6a\left(-1+c^2x^2\right)\sqrt{d-c^2dx^2}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right) \cdots}{6\cdots}$$

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (-3*b*Sqrt[d]*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2 - 6*a*(-1 + c^2*x^2)*Sqrt[d
 - c^2*d*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] +
Sqrt[d]*(6*a*c*x - 8*a*c^3*x^3 + b*Sqrt[1 - c^2*x^2] + 4*b*(1 - c^2*x^2)^(3
/2)*Log[1 - c^2*x^2]) + 2*b*Sqrt[d]*ArcSin[c*x]*Sin[3*ArcSin[c*x]])/(6*c^5*
d^(5/2)*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.20 (sec) , antiderivative size = 359, normalized size of antiderivative = 1.69

method	result
default	$\frac{a\,x^3}{3c^2d(-c^2d\,x^2+d)^{\frac{3}{2}}} - \frac{ax}{c^4d^2\sqrt{-c^2d\,x^2+d}} + \frac{a\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{c^4d^2\sqrt{c^2d}} - \frac{b\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\left(3\arcsin(cx)^2x^4c^4+8i\arcsin(\cdots\right.}{\cdots}$
parts	$\frac{a\,x^3}{3c^2d(-c^2d\,x^2+d)^{\frac{3}{2}}} - \frac{ax}{c^4d^2\sqrt{-c^2d\,x^2+d}} + \frac{a\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{c^4d^2\sqrt{c^2d}} - \frac{b\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\left(3\arcsin(cx)^2x^4c^4+8i\arcsin(\cdots\right.}{\cdots}$

```
[In] int(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*a*x^3/c^2/d/(-c^2*d*x^2+d)^(3/2)-a/c^4/d^2*x/(-c^2*d*x^2+d)^(1/2)+a/c^4
/d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/6*b*(-d*(
c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(3*arcsin(c*x)^2*x^4*c^4+8*I*arcsin(c*
x)*x^4*c^4-8*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*x^4*c^4+8*(-c^2*x^2+1)^(1/2
)*arcsin(c*x)*c^3*x^3-6*arcsin(c*x)^2*x^2*c^2-16*I*arcsin(c*x)*x^2*c^2+16*l
n(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*x^2*c^2-6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*
x*c+c^2*x^2+3*arcsin(c*x)^2+8*I*arcsin(c*x)-8*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2
))^2)-1)/d^3/(c^6*x^6-3*c^4*x^4+3*c^2*x^2-1)/c^5
```

Fricas [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)x^4}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-(b*x^4*arcsin(c*x) + a*x^4)*sqrt(-c^2*d*x^2 + d)/(c^6*d^3*x^6 - 3
*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^4(a+b\operatorname{asin}(cx))}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)x^4}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*(x*(3*x^2/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^
4*d)) - x/(sqrt(-c^2*d*x^2 + d)*c^4*d^2) + 3*arcsin(c*x)/(c^5*d^(5/2)))*a +
 b*integrate(x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^4*d^2*x^4 -
 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^4(a + b \arcsin(cx))}{(d - c^2dx^2)^{5/2}}\, dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a + b \arcsin(cx))}{(d - c^2dx^2)^{5/2}}\, dx = \int \frac{x^4\,(a + b \operatorname{asin}(c\,x))}{(d - c^2\,d\,x^2)^{5/2}}\, dx$$

```
[In] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((x^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.132 $\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 150

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{bx\sqrt{d-c^2dx^2}}{6c^3d^3(1-c^2x^2)^{3/2}} + \frac{a+b\arcsin(cx)}{3c^4d(d-c^2dx^2)^{3/2}} - \frac{a+b\arcsin(cx)}{c^4d^2\sqrt{d-c^2dx^2}} + \frac{5b\sqrt{d-c^2dx^2}\operatorname{arctanh}(cx)}{6c^4d^3\sqrt{1-c^2x^2}}$$

```
[Out] 1/3*(a+b*arcsin(c*x))/c^4/d/(-c^2*d*x^2+d)^(3/2)+(-a-b*arcsin(c*x))/c^4/d^2
/(-c^2*d*x^2+d)^(1/2)-1/6*b*x*(-c^2*d*x^2+d)^(1/2)/c^3/d^3/(-c^2*x^2+1)^(3/
2)+5/6*b*arctanh(c*x)*(-c^2*d*x^2+d)^(1/2)/c^4/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {272, 45, 4779, 12, 393, 212}

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{a+b\arcsin(cx)}{c^4d^2\sqrt{d-c^2dx^2}} + \frac{a+b\arcsin(cx)}{3c^4d(d-c^2dx^2)^{3/2}} + \frac{5b\operatorname{arctanh}(cx)\sqrt{d-c^2dx^2}}{6c^4d^3\sqrt{1-c^2x^2}} - \frac{bx\sqrt{d-c^2dx^2}}{6c^3d^3(1-c^2x^2)^{3/2}}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*(b*x*Sqrt[d - c^2*d*x^2])/(c^3*d^3*(1 - c^2*x^2)^(3/2)) + (a + b*ArcSi
n[c*x])/(3*c^4*d*(d - c^2*d*x^2)^(3/2)) - (a + b*ArcSin[c*x])/(c^4*d^2*Sqrt
[d - c^2*d*x^2]) + (5*b*Sqrt[d - c^2*d*x^2]*ArcTanh[c*x])/(6*c^4*d^3*Sqrt[1
 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 393

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(-(b*c - a*d))*x*((a + b*x^n)^(p + 1)/(a*b*n*(p + 1))), x] - Dist[(a*d -
 b*c*(n*(p + 1) + 1))/(a*b*n*(p + 1)), Int[(a + b*x^n)^(p + 1), x], x] /; F
reeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d, 0] && (LtQ[p, -1] || ILtQ[1/n
 + p, 0])
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\text{integral} = \frac{a+b\arcsin(cx)}{3c^4d\left(d-c^2dx^2\right)^{3/2}} - \frac{a+b\arcsin(cx)}{c^4d^2\sqrt{d-c^2dx^2}} - \frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-2+3c^2x^2}{3c^4d^3(1-c^2x^2)^2}\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{a+b\arcsin(cx)}{3c^4d\,(d-c^2dx^2)^{3/2}} - \frac{a+b\arcsin(cx)}{c^4d^2\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{d-c^2dx^2}\right)\int \frac{-2+3c^2x^2}{(1-c^2x^2)^2}\,dx}{3c^3d^3\sqrt{1-c^2x^2}}$$

$$= -\frac{bx\sqrt{d-c^2dx^2}}{6c^3d^3\,(1-c^2x^2)^{3/2}} + \frac{a+b\arcsin(cx)}{3c^4d\,(d-c^2dx^2)^{3/2}} - \frac{a+b\arcsin(cx)}{c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(5b\sqrt{d-c^2dx^2}\right)\int \frac{1}{1-c^2x^2}\,dx}{6c^3d^3\sqrt{1-c^2x^2}}$$

$$= -\frac{bx\sqrt{d-c^2dx^2}}{6c^3d^3\,(1-c^2x^2)^{3/2}} + \frac{a+b\arcsin(cx)}{3c^4d\,(d-c^2dx^2)^{3/2}} - \frac{a+b\arcsin(cx)}{c^4d^2\sqrt{d-c^2dx^2}} + \frac{5b\sqrt{d-c^2dx^2}\operatorname{arctanh}(cx)}{6c^4d^3\sqrt{1-c^2x^2}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

Time = 0.18 (sec) , antiderivative size = 143, normalized size of antiderivative = 0.95

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{\sqrt{d-c^2dx^2}\left(\sqrt{-c^2}\left(-4a+6ac^2x^2-bcx\sqrt{1-c^2x^2}+2b(-2+3c^2x^2)\arcsin(cx\right.\right.}{6c^4\sqrt{-c^2}d^3\,(-1+c^2x^2)}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(Sqrt[-c^2]*(-4*a + 6*a*c^2*x^2 - b*c*x*Sqrt[1 - c^2*x
^2] + 2*b*(-2 + 3*c^2*x^2)*ArcSin[c*x]) - (5*I)*b*c*(1 - c^2*x^2)^(3/2)*Ell
ipticF[I*ArcSinh[Sqrt[-c^2]*x], 1]))/(6*c^4*Sqrt[-c^2]*d^3*(-1 + c^2*x^2)^2
)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.13 (sec) , antiderivative size = 252, normalized size of antiderivative = 1.68

method	result
default	$a\left(\frac{x^2}{c^2d(-c^2dx^2+d)^{\frac{3}{2}}} - \frac{2}{3dc^4(-c^2dx^2+d)^{\frac{3}{2}}}\right) + b\left(\frac{\sqrt{-d(c^2x^2-1)}\left(6c^2x^2\arcsin(cx)-cx\sqrt{-c^2x^2+1}-4\arcsin(cx)\right)}{6(c^2x^2-1)^2d^3c^4} - \frac{5\sqrt{-}}{}\right.$
parts	$a\left(\frac{x^2}{c^2d(-c^2dx^2+d)^{\frac{3}{2}}} - \frac{2}{3dc^4(-c^2dx^2+d)^{\frac{3}{2}}}\right) + b\left(\frac{\sqrt{-d(c^2x^2-1)}\left(6c^2x^2\arcsin(cx)-cx\sqrt{-c^2x^2+1}-4\arcsin(cx)\right)}{6(c^2x^2-1)^2d^3c^4} - \frac{5\sqrt{-}}{}\right.$

```
[In] int(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(x^2/c^2/d/(-c^2*d*x^2+d)^(3/2)-2/3/d/c^4/(-c^2*d*x^2+d)^(3/2))+b*(1/6*(-
d*(c^2*x^2-1))^(1/2)*(6*c^2*x^2*arcsin(c*x)-c*x*(-c^2*x^2+1)^(1/2)-4*arcsin
(c*x))/(c^2*x^2-1)^2/d^3/c^4-5/6*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/
c^4/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)+5/6*(-d*(c^2*x^2-1))^(1/
2)*(-c^2*x^2+1)^(1/2)/c^4/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 421, normalized size of antiderivative = 2.81

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \Bigg[-\frac{4\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}bcx - 5\,(bc^4x^4-2\,bc^2x^2+b)\sqrt{d}\log\left(-\frac{c^6dx^6+5\,c^4dx\cdots}{\cdots}\right)\cdots}{2\cdots}$$

$$-\frac{2\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}bcx - 5\,(bc^4x^4-2\,bc^2x^2+b)\sqrt{-d}\arctan\left(\frac{2\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}c\sqrt{-d}x}{c^4dx^4-d}\right) - 4\,(3\,ac^2x\cdots}{12\,(c^8d^3x^4-2\,c^6d^3x^2+c^4d^3)}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [-1/24*(4*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x - 5*(b*c^4*x^4 - 2*
b*c^2*x^2 + b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^2 - 4*(c^3
*x^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/(c^6*x^6 -
 3*c^4*x^4 + 3*c^2*x^2 - 1)) - 8*(3*a*c^2*x^2 + (3*b*c^2*x^2 - 2*b)*arcsin(
c*x) - 2*a)*sqrt(-c^2*d*x^2 + d))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3),
-1/12*(2*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x - 5*(b*c^4*x^4 - 2*b
*c^2*x^2 + b)*sqrt(-d)*arctan(2*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*c*s
qrt(-d)*x/(c^4*d*x^4 - d)) - 4*(3*a*c^2*x^2 + (3*b*c^2*x^2 - 2*b)*arcsin(c*
x) - 2*a)*sqrt(-c^2*d*x^2 + d))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3)]
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^3(a+b\operatorname{asin}(cx))}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**3*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.07

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{1}{12}\,bc\left(\frac{2\,x}{c^6d^{\frac{5}{2}}x^2-c^4d^{\frac{5}{2}}}+\frac{5\,\log(cx+1)}{c^5d^{\frac{5}{2}}}-\frac{5\,\log(cx-1)}{c^5d^{\frac{5}{2}}}\right) + \frac{1}{3}\,b\left(\frac{3\,x^2}{(-c^2dx^2+d)^{\frac{3}{2}}c^2d}-\frac{2}{(-c^2dx^2+d)^{\frac{3}{2}}c^4d}\right)\arcsin(cx) + \frac{1}{3}\,a\left(\frac{3\,x^2}{(-c^2dx^2+d)^{\frac{3}{2}}c^2d}-\frac{2}{(-c^2dx^2+d)^{\frac{3}{2}}c^4d}\right)$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/12*b*c*(2*x/(c^6*d^(5/2)*x^2 - c^4*d^(5/2)) + 5*log(c*x + 1)/(c^5*d^(5/2)
) - 5*log(c*x - 1)/(c^5*d^(5/2))) + 1/3*b*(3*x^2/((-c^2*d*x^2 + d)^(3/2)*c^
2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d))*arcsin(c*x) + 1/3*a*(3*x^2/((-c^2*
d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^3\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((x^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.133 $\int \frac{x^2(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 125

$$\int \frac{x^2(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{b}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}} - \frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{6c^3d^2\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*x^3*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(3/2)-1/6*b/c^3/d^2/(-c^2*x^2+1)
^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/6*b*ln(-c^2*x^2+1)*(-c^2*x^2+1)^(1/2)/c^3/d^2
/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4771, 272, 45}

$$\int \frac{x^2(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{x^3(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}} - \frac{b}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{6c^3d^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*b/(c^3*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin
[c*x]))/(3*d*(d - c^2*d*x^2)^(3/2)) - (b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2]
)/(6*c^3*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^3(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{\left(bc\sqrt{1-c^2x^2}\right)\int\frac{x^3}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}\\
&= \frac{x^3(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{\left(bc\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{x}{(1-c^2x)^2}\,dx,x,x^2\right)}{6d^2\sqrt{d-c^2dx^2}}\\
&= \frac{x^3(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{\left(bc\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\left(\frac{1}{c^2(-1+c^2x)^2}+\frac{1}{c^2(-1+c^2x)}\right)\,dx,x,x^2\right)}{6d^2\sqrt{d-c^2dx^2}}\\
&= -\frac{b}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{6c^3d^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.82

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{\sqrt{d-c^2dx^2}\left(2ac^3x^3-b\sqrt{1-c^2x^2}+2bc^3x^3\arcsin(cx)-b(1-c^2x^2)^{3/2}\log\left(-1+\right.\right.}{6c^3d^3\left(-1+c^2x^2\right)^2}$$

[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]

[Out] (Sqrt[d - c^2*d*x^2]*(2*a*c^3*x^3 - b*Sqrt[1 - c^2*x^2] + 2*b*c^3*x^3*ArcSi
n[c*x] - b*(1 - c^2*x^2)^(3/2)*Log[-1 + c^2*x^2]))/(6*c^3*d^3*(-1 + c^2*x^2
)^2)

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.18 (sec) , antiderivative size = 1242, normalized size of antiderivative = 9.94

method	result	size
default	Expression too large to display	1242
parts	Expression too large to display	1242

[In] int(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)

[Out] a*(1/2*x/c^2/d/(-c^2*d*x^2+d)^(3/2)-1/2/c^2*(1/3/d*x/(-c^2*d*x^2+d)^(3/2)+2
/3/d^2*x/(-c^2*d*x^2+d)^(1/2)))+1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x
^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*(-c^2*x^2+1)*x^3-1/6*I*b*(-d*(c^2*x^2-
1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^4*x^7+b*(-d*(c
^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^4*arcsi
n(c*x)*x^7+I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5
*c^2*x^2+1)*c^3*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^6-1/3*I*b*(-d*(c^2*x^2-1))
^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*arcsin(c*x)*(-c
^2*x^2+1)^(1/2)-2/3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d^3/(
c^2*x^2-1)*arcsin(c*x)-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^
6+10*c^4*x^4-5*c^2*x^2+1)*c*(-c^2*x^2+1)^(1/2)*x^4-b*(-d*(c^2*x^2-1))^(1/2)
/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*arcsin(c*x)*x^5+4/3*I
b(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/
c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2-2*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^
8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^
4+1/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*
x^2+1)*c^2*x^5+1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4
*x^4-5*c^2*x^2+1)/c*(-c^2*x^2+1)^(1/2)*x^2+1/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3
/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*arcsin(c*x)*x^3-1/6*I*b*(-d*(
c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*(-c^

```
2*x^2+1)*x^5-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4
*x^4-5*c^2*x^2+1)*x^3-1/6*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6
+10*c^4*x^4-5*c^2*x^2+1)/c^3*(-c^2*x^2+1)^(1/2)+1/3*b*(-d*(c^2*x^2-1))^(1/2
)*(-c^2*x^2+1)^(1/2)/c^3/d^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin{(cx)}+a)x^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*x^2*arcsin(c*x) + a*x^2)/(c^6*d^3*x^6 - 3
*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^2(a+b\operatorname{asin}{(cx)})}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral(x**2*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.22

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{1}{6}bc\left(\frac{1}{c^6d^{\frac{5}{2}}x^2-c^4d^{\frac{5}{2}}}-\frac{\log{(cx+1)}}{c^4d^{\frac{5}{2}}}-\frac{\log{(cx-1)}}{c^4d^{\frac{5}{2}}}\right) - \frac{1}{3}b\left(\frac{x}{\sqrt{-c^2dx^2+d}c^2d^2}-\frac{x}{(-c^2dx^2+d)^{\frac{3}{2}}c^2d}\right)\arcsin{(cx)} - \frac{1}{3}a\left(\frac{x}{\sqrt{-c^2dx^2+d}c^2d^2}-\frac{x}{(-c^2dx^2+d)^{\frac{3}{2}}c^2d}\right)$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
[Out] 1/6*b*c*(1/(c^6*d^(5/2)*x^2 - c^4*d^(5/2)) - log(c*x + 1)/(c^4*d^(5/2)) - l
og(c*x - 1)/(c^4*d^(5/2))) - 1/3*b*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((
-c^2*d*x^2 + d)^(3/2)*c^2*d))*arcsin(c*x) - 1/3*a*(x/(sqrt(-c^2*d*x^2 + d)*
c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate(x^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

[In] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)

[Out] int((x^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)

3.134 $\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 119

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{bx}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\arcsin(cx)}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{b\sqrt{1-c^2x^2}\text{arctanh}(cx)}{6c^2d^2\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(3/2)-1/6*b*x/c/d^2/(-c^2*x^2+1)
^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/6*b*arctanh(c*x)*(-c^2*x^2+1)^(1/2)/c^2/d^2/(
-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4767, 205, 212}

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{a+b\arcsin(cx)}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{b\sqrt{1-c^2x^2}\text{arctanh}(cx)}{6c^2d^2\sqrt{d-c^2dx^2}} - \frac{bx}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*(b*x)/(c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*
x])/(3*c^2*d*(d - c^2*d*x^2)^(3/2)) - (b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(6
*c^2*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a+b\arcsin(cx)}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{1}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}\\
&= -\frac{bx}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\arcsin(cx)}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{1}{1-c^2x^2}\,dx}{6cd^2\sqrt{d-c^2dx^2}}\\
&= -\frac{bx}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\arcsin(cx)}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{b\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{6c^2d^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.71

$$\int\frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{-2a+bcx\sqrt{1-c^2x^2}-2b\arcsin(cx)+b(1-c^2x^2)^{3/2}\operatorname{arctanh}(cx)}{6c^2d^2\,(-1+c^2x^2)\sqrt{d-c^2dx^2}}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
[Out] (-2*a + b*c*x*Sqrt[1 - c^2*x^2] - 2*b*ArcSin[c*x] + b*(1 - c^2*x^2)^(3/2)*A
rcTanh[c*x])/(6*c^2*d^2*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.16 (sec) , antiderivative size = 223, normalized size of antiderivative = 1.87

method	result
default	$\frac{a}{3c^2d(-c^2d\,x^2+d)^{\frac{3}{2}}}+b\left(\frac{\sqrt{-d(c^2x^2-1)}\,\left(-cx\sqrt{-c^2x^2+1}+2\arcsin(cx)\right)}{6d^3(c^4x^4-2c^2x^2+1)c^2}+\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\ln\left(icx+\sqrt{-c^2x^2+1}+i\right)}{6c^2d^3(c^2x^2-1)}\right.$
parts	$\frac{a}{3c^2d(-c^2d\,x^2+d)^{\frac{3}{2}}}+b\left(\frac{\sqrt{-d(c^2x^2-1)}\,\left(-cx\sqrt{-c^2x^2+1}+2\arcsin(cx)\right)}{6d^3(c^4x^4-2c^2x^2+1)c^2}+\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\ln\left(icx+\sqrt{-c^2x^2+1}+i\right)}{6c^2d^3(c^2x^2-1)}\right.$

```
[In] int(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*a/c^2/d/(-c^2*d*x^2+d)^(3/2)+b*(1/6*(-d*(c^2*x^2-1))^(1/2)*(-c*x*(-c^2*
x^2+1)^(1/2)+2*arcsin(c*x))/d^3/(c^4*x^4-2*c^2*x^2+1)/c^2+1/6*(-d*(c^2*x^2-
1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^2/d^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2
)+I)-1/6*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^2/d^3/(c^2*x^2-1)*ln(I
*c*x+(-c^2*x^2+1)^(1/2)-I))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 374, normalized size of antiderivative = 3.14

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \left[-\frac{4\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}bcx-(bc^4x^4-2\,bc^2x^2+b)\sqrt{d}\log\left(-\frac{c^6dx^6+5\,c^4dx^4\cdots}{\cdots}\right)\cdots}{24\,(c^6d^3x^4-2\cdots)}\right.$$

$$-\frac{2\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}bcx+(bc^4x^4-2\,bc^2x^2+b)\sqrt{-d}\arctan\left(\frac{2\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}c\sqrt{-d}x}{c^4dx^4-d}\right)-4\sqrt{-c^2d\cdots}}{12\,(c^6d^3x^4-2\,c^4d^3x^2+c^2d^3)}$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [-1/24*(4*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*b*c*x - (b*c^4*x^4 - 2*b*
c^2*x^2 + b)*sqrt(d)*log(-(c^6*d*x^6 + 5*c^4*d*x^4 - 5*c^2*d*x^2 + 4*(c^3*x
^3 + c*x)*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*sqrt(d) - d)/(c^6*x^6 - 3
*c^4*x^4 + 3*c^2*x^2 - 1)) - 8*sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a))/(c
^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3), -1/12*(2*sqrt(-c^2*d*x^2 + d)*sqrt(-
c^2*x^2 + 1)*b*c*x + (b*c^4*x^4 - 2*b*c^2*x^2 + b)*sqrt(-d)*arctan(2*sqrt(-
c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)*c*sqrt(-d)*x/(c^4*d*x^4 - d)) - 4*sqrt(-c
^2*d*x^2 + d)*(b*arcsin(c*x) + a))/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)]
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x(a+b\operatorname{asin}(cx))}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

[In] integrate(x*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)

[Out] Integral(x*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)

Maxima [F]

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)x}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")

[Out] b*integrate(x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d) + 1/3*a/((-c^2*d*x^2 + d)^(3/2)*c^2*d)

Giac [F(-2)]

Exception generated.

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate(x*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x\,(a+b\operatorname{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

[In] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)

[Out] int((x*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)

3.135 $\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 154

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{b}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x(a+b\arcsin(cx))}{3d(d-c^2dx^2)^{3/2}} + \frac{2x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{3cd^2\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*x*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(3/2)+2/3*x*(a+b*arcsin(c*x))/d^2/
(-c^2*d*x^2+d)^(1/2)-1/6*b/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+1/
3*b*ln(-c^2*x^2+1)*(-c^2*x^2+1)^(1/2)/c/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4747, 4745, 266, 267}

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{5/2}}\,dx = \frac{2x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} + \frac{x(a+b\arcsin(cx))}{3d(d-c^2dx^2)^{3/2}} - \frac{b}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{3cd^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*b/(c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x*(a + b*ArcSin[c*x
]))/(3*d*(d - c^2*d*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d -
 c^2*d*x^2]) + (b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2])/(3*c*d^2*Sqrt[d - c^2
*d*x^2])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rubi steps

$$\text{integral} = \frac{x(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{3/2}}\,dx}{3d} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{x}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} - \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{x}{1-c^2x^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{3cd^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.73

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{5/2}}\,dx =$$
$$-\frac{\sqrt{d-c^2dx^2}\left(-6acx+4ac^3x^3+b\sqrt{1-c^2x^2}+2bcx(-3+2c^2x^2)\arcsin(cx)-2b(1-c^2x^2)^{3/2}\log\left(-1+c^2 \right.\right.}{6cd^3\left(-1+c^2x^2\right)^2}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] -1/6*(Sqrt[d - c^2*d*x^2]*(-6*a*c*x + 4*a*c^3*x^3 + b*Sqrt[1 - c^2*x^2] + 2
*b*c*x*(-3 + 2*c^2*x^2)*ArcSin[c*x] - 2*b*(1 - c^2*x^2)^(3/2)*Log[-1 + c^2*
x^2]))/(c*d^3*(-1 + c^2*x^2)^2)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.16 (sec) , antiderivative size = 1072, normalized size of antiderivative = 6.96

method	result	size
default	Expression too large to display	1072
parts	Expression too large to display	1072

```
[In] int((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/3/d*x/(-c^2*d*x^2+d)^(3/2)+2/3/d^2*x/(-c^2*d*x^2+d)^(1/2))+2/3*I*b*(-d
*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*(-c^2*x^2+1
)*x^5+I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*(-
c^2*x^2+1)*x-I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^
2-4)*x-2*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)
*c^3*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4-2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c
^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*arcsin(c*x)*x^5+8/3*I*b*(-d*(c^2*x^2-1)
)^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*x^3-5/3*I*b*(-d*(c^2*x^
2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*(-c^2*x^2+1)*x^3+4/
3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d^3/(c^2*x^2-1)*arcsin(c*
x)-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(
-c^2*x^2+1)^(1/2)*x^2+17/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x
^4+11*c^2*x^2-4)*c^2*arcsin(c*x)*x^3-8/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*
c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-7/3*I*b*(
-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*x^5+14/3*
I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2*
x^2+1)^(1/2)*arcsin(c*x)*x^2+2/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10
*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)-4*b*(-d*(c^2*x^2-1))^(1/2)/d^3/
```

```
(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)*x+2/3*I*b*(-d*(c^2*x^2-1))^
(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^6*x^7-2/3*b*(-d*(c^2*x^2-1)
)^(1/2)*(-c^2*x^2+1)^(1/2)/c/d^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2)
)^2)
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{b\arcsin{(cx)}+a}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")

[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{a+b\operatorname{asin}{(cx)}}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

[In] integrate((a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)

[Out] Integral((a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 141, normalized size of antiderivative = 0.92

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{5/2}}\,dx=\frac{1}{6}bc\left(\frac{1}{c^4d^{\frac{5}{2}}x^2-c^2d^{\frac{5}{2}}}+\frac{2\log{(cx+1)}}{c^2d^{\frac{5}{2}}}+\frac{2\log{(cx-1)}}{c^2d^{\frac{5}{2}}}\right)+\frac{1}{3}b\left(\frac{2x}{\sqrt{-c^2dx^2+d}d^2}+\frac{x}{(-c^2dx^2+d)^{\frac{3}{2}}d}\right)\arcsin{(cx)}+\frac{1}{3}a\left(\frac{2x}{\sqrt{-c^2dx^2+d}d^2}+\frac{x}{(-c^2dx^2+d)^{\frac{3}{2}}d}\right)$$

[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")

[Out] 1/6*b*c*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*(2*x/(sqrt(-c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a*(2*x/(sqrt(-c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))

Giac [F(-2)]

Exception generated.

$$\int \frac{a + b \arcsin(cx)}{(d - c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(cx)}{(d - c^2dx^2)^{5/2}}\,dx = \int \frac{a + b\,\mathrm{asin}(c\,x)}{(d - c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))/(d - c^2*d*x^2)^(5/2), x)
```

3.136 $\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 291

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{a+b\arcsin(cx)}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{a+b\arcsin(cx)}{d^2\sqrt{d-c^2dx^2}}-\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{7b\sqrt{1-c^2x^2}\text{arctanh}(cx)}{6d^2\sqrt{d-c^2dx^2}}+\frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(3/2)+(a+b*arcsin(c*x))/d^2/(-c^2*d*
x^2+d)^(1/2)-1/6*b*c*x/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2*(a+b*a
rcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*
d*x^2+d)^(1/2)-7/6*b*arctanh(c*x)*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/
2)+I*b*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*
x^2+d)^(1/2)-I*b*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2
/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 291, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4793, 4803, 4268, 2317, 2438, 212, 205}

$$\int \frac{a+b\arcsin(cx)}{x(d-c^2dx^2)^{5/2}}\,dx = -\frac{2\sqrt{1-c^2x^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2\sqrt{d-c^2dx^2}} + \frac{a+b\arcsin(cx)}{d^2\sqrt{d-c^2dx^2}} + \frac{a+b\arcsin(cx)}{3d(d-c^2dx^2)^{3/2}} + \frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} - \frac{ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} - \frac{7b\sqrt{1-c^2x^2}\text{arctanh}(cx)}{6d^2\sqrt{d-c^2dx^2}} - \frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/6*(b*c*x)/(d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*
x])/(3*d*(d - c^2*d*x^2)^(3/2)) + (a + b*ArcSin[c*x])/(d^2*Sqrt[d - c^2*d*x
^2]) - (2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])
/(d^2*Sqrt[d - c^2*d*x^2]) - (7*b*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(6*d^2*Sq
rt[d - c^2*d*x^2]) + (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])
/(d^2*Sqrt[d - c^2*d*x^2]) - (I*b*Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[
c*x])])/(d^2*Sqrt[d - c^2*d*x^2])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{a+b\arcsin(cx)}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{\int\frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{3/2}}\,dx}{d}-\frac{\left(bc\sqrt{1-c^2x^2}\right)\int\frac{1}{\left(1-c^2x^2\right)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}\\
&= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{a+b\arcsin(cx)}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{a+b\arcsin(cx)}{d^2\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\int\frac{a+b\arcsin(cx)}{x\sqrt{d-c^2dx^2}}\,dx}{d^2}-\frac{\left(bc\sqrt{1-c^2x^2}\right)\int\frac{1}{1-c^2x^2}\,dx}{6d^2\sqrt{d-c^2dx^2}}-\frac{\left(bc\sqrt{1-c^2x^2}\right)\int\frac{1}{1-c^2x^2}\,dx}{d^2\sqrt{d-c^2dx^2}}\\
&= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{a+b\arcsin(cx)}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{a+b\arcsin(cx)}{d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{7b\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{6d^2\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}\operatorname{Subst}\left(\int(a+bx)\csc(x)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\arcsin(cx)}{3d\,(d-c^2dx^2)^{3/2}} + \frac{a+b\arcsin(cx)}{d^2\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} - \frac{7b\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{6d^2\sqrt{d-c^2dx^2}} - \frac{\left(b\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} + \frac{\left(b\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\arcsin(cx)}{3d\,(d-c^2dx^2)^{3/2}} + \frac{a+b\arcsin(cx)}{d^2\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} - \frac{7b\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{6d^2\sqrt{d-c^2dx^2}} + \frac{\left(ib\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} - \frac{\left(ib\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bcx}{6d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{a+b\arcsin(cx)}{3d\,(d-c^2dx^2)^{3/2}} + \frac{a+b\arcsin(cx)}{d^2\sqrt{d-c^2dx^2}} - \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} - \frac{7b\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{6d^2\sqrt{d-c^2dx^2}} + \frac{ib\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2, -e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} - \frac{ib\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2, e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 1.36 (sec) , antiderivative size = 456, normalized size of antiderivative = 1.57

$$\int \frac{a+b\arcsin(cx)}{x\,(d-c^2dx^2)^{5/2}}\,dx = -\frac{a(-4+3c^2x^2)\sqrt{d-c^2dx^2}}{3d^3\,(-1+c^2x^2)^2} + \frac{a\log(x)}{d^{5/2}} - \frac{a\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)}{d^{5/2}} + \frac{b\Big(20\arcsin(cx) + 12\arcsin(cx)\cos(2\arcsin(cx)) + 18\sqrt{1-c^2x^2}\arcsin(cx)\log\left(1-e^{i\arcsin(cx)}\right) + 6\arcsin(}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/3*(a*(-4 + 3*c^2*x^2)*Sqrt[d - c^2*d*x^2])/(d^3*(-1 + c^2*x^2)^2) + (a*L
og[x])/d^(5/2) - (a*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/d^(5/2) + (b*(20*
ArcSin[c*x] + 12*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 18*Sqrt[1 - c^2*x^2]*ArcS
in[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 6*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1
```

```
- E^(I*ArcSin[c*x])] - 18*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + E^(I*ArcSi
n[c*x])] - 6*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + E^(I*ArcSin[c*x])] + 21
*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 7*Cos[3*A
rcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 21*Sqrt[1 - c^2*
x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 7*Cos[3*ArcSin[c*x]]*Lo
g[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + (24*I)*(1 - c^2*x^2)^(3/2)*Pol
yLog[2, -E^(I*ArcSin[c*x])] - (24*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2, E^(I*Ar
cSin[c*x])] - 2*Sin[2*ArcSin[c*x]]))/(24*d*(d - c^2*d*x^2)^(3/2))
```

Maple [A] (verified)

Time = 0.22 (sec) , antiderivative size = 512, normalized size of antiderivative = 1.76

method	result
default	$\frac{a}{3d\left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}+\frac{a}{d^{2} \sqrt{-c^{2} d\,x^{2}+d}}-\frac{a \ln\left(\frac{2 d+2 \sqrt{d}\,\sqrt{-c^{2} d\,x^{2}+d}}{x}\right)}{d^{\frac{5}{2}}}-\frac{i b \sqrt{-d\left(c^{2} x^{2}-1\right)}\,\sqrt{-c^{2} x^{2}+1}\,\left(6 i \sqrt{-c^{2} x^{2}+1}\,\arcsin\left(c x\right) c^{2} x^{2} \cdots\right.}{\cdots}$
parts	$\frac{a}{3d\left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}+\frac{a}{d^{2} \sqrt{-c^{2} d\,x^{2}+d}}-\frac{a \ln\left(\frac{2 d+2 \sqrt{d}\,\sqrt{-c^{2} d\,x^{2}+d}}{x}\right)}{d^{\frac{5}{2}}}-\frac{i b \sqrt{-d\left(c^{2} x^{2}-1\right)}\,\sqrt{-c^{2} x^{2}+1}\,\left(6 i \sqrt{-c^{2} x^{2}+1}\,\arcsin\left(c x\right) c^{2} x^{2} \cdots\right.}{\cdots}$

```
[In] int((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*a/d/(-c^2*d*x^2+d)^(3/2)+a/d^2/(-c^2*d*x^2+d)^(1/2)-a/d^(5/2)*ln((2*d+2
*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+
1)^(1/2)*(6*I*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2*c^2+6*dilog(1+I*c*x+(-c^2*
x^2+1)^(1/2))*c^4*x^4+6*dilog(I*c*x+(-c^2*x^2+1)^(1/2))*c^4*x^4+14*arctan(I
*c*x+(-c^2*x^2+1)^(1/2))*c^4*x^4-I*x^3*c^3-8*I*(-c^2*x^2+1)^(1/2)*arcsin(c*
x)+I*c*x-12*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))*c^2*x^2-12*dilog(I*c*x+(-c^2*
x^2+1)^(1/2))*c^2*x^2-28*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*c^2*x^2+6*I*arcsi
n(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))*x^4*c^4+6*I*arcsin(c*x)*ln(1+I*c*x+(-
c^2*x^2+1)^(1/2))-12*I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))*x^2*c^2+6
*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+6*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+14*arc
tan(I*c*x+(-c^2*x^2+1)^(1/2)))/(c^6*x^6-3*c^4*x^4+3*c^2*x^2-1)/d^3
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^7 - 3*c^4*d^3
*x^5 + 3*c^2*d^3*x^3 - d^3*x), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{a+b\operatorname{asin}\left(cx\right)}{x\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral((a + b*asin(c*x))/(x*(-d*(c*x - 1)*(c*x + 1))**(5/2)), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
[Out] -1/3*a*(3*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^(5/2) -
 3/(sqrt(-c^2*d*x^2 + d)*d^2) - 1/((-c^2*d*x^2 + d)^(3/2)*d)) + b*integrate
(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^4*d^2*x^5 - 2*c^2*d^2*x^3 +
 d^2*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{a+b\operatorname{asin}(c\,x)}{x\left(d-c^2\,d\,x^2\right)^{5/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^(5/2)),x)
[Out] int((a + b*asin(c*x))/(x*(d - c^2*d*x^2)^(5/2)), x)
```

3.137 $\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 224

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{bc\sqrt{d-c^2dx^2}}{6d^3\left(1-c^2x^2\right)^{3/2}}-\frac{a+b\arcsin(cx)}{dx\left(d-c^2dx^2\right)^{3/2}}+\frac{4c^2x(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{8c^2x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{d-c^2dx^2}\log(x)}{d^3\sqrt{1-c^2x^2}}+\frac{5bc\sqrt{d-c^2dx^2}\log\left(1-c^2x^2\right)}{6d^3\sqrt{1-c^2x^2}}$$

```
[Out] (-a-b*arcsin(c*x))/d/x/(-c^2*d*x^2+d)^(3/2)+4/3*c^2*x*(a+b*arcsin(c*x))/d/(
-c^2*d*x^2+d)^(3/2)+8/3*c^2*x*(a+b*arcsin(c*x))/d^2/(-c^2*d*x^2+d)^(1/2)-1/
6*b*c*(-c^2*d*x^2+d)^(1/2)/d^3/(-c^2*x^2+1)^(3/2)+b*c*ln(x)*(-c^2*d*x^2+d)^
(1/2)/d^3/(-c^2*x^2+1)^(1/2)+5/6*b*c*ln(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/d^
3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 224, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {277, 198, 197, 4779, 12, 1265, 907}

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{8c^2x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}+\frac{4c^2x(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{a+b\arcsin(cx)}{dx\left(d-c^2dx^2\right)^{3/2}}-\frac{bc\sqrt{d-c^2dx^2}}{6d^3\left(1-c^2x^2\right)^{3/2}}+\frac{bc\log(x)\sqrt{d-c^2dx^2}}{d^3\sqrt{1-c^2x^2}}+\frac{5bc\sqrt{d-c^2dx^2}\log\left(1-c^2x^2\right)}{6d^3\sqrt{1-c^2x^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/6*(b*c*Sqrt[d - c^2*d*x^2])/(d^3*(1 - c^2*x^2)^(3/2)) - (a + b*ArcSin[c*
x])/(d*x*(d - c^2*d*x^2)^(3/2)) + (4*c^2*x*(a + b*ArcSin[c*x]))/(3*d*(d - c
^2*d*x^2)^(3/2)) + (8*c^2*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c^2*d*x^2]
) + (b*c*Sqrt[d - c^2*d*x^2]*Log[x])/(d^3*Sqrt[1 - c^2*x^2]) + (5*b*c*Sqrt[
d - c^2*d*x^2]*Log[1 - c^2*x^2])/(6*d^3*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx)}{dx\,(d-c^2dx^2)^{3/2}}+\frac{4c^2x(a+b\arcsin(cx))}{3d\,(d-c^2dx^2)^{3/2}} \\
&\quad +\frac{8c^2x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-3+12c^2x^2-8c^4x^4}{3d^3x(1-c^2x^2)^2}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{a+b\arcsin(cx)}{dx\,(d-c^2dx^2)^{3/2}}+\frac{4c^2x(a+b\arcsin(cx))}{3d\,(d-c^2dx^2)^{3/2}} \\
&\quad +\frac{8c^2x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-3+12c^2x^2-8c^4x^4}{x(1-c^2x^2)^2}\,dx}{3d^3\sqrt{1-c^2x^2}} \\
&= -\frac{a+b\arcsin(cx)}{dx\,(d-c^2dx^2)^{3/2}}+\frac{4c^2x(a+b\arcsin(cx))}{3d\,(d-c^2dx^2)^{3/2}}+\frac{8c^2x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{-3+12c^2x-8c^4x^2}{x(1-c^2x)^2}\,dx,x,x^2\right)}{6d^3\sqrt{1-c^2x^2}} \\
&= -\frac{a+b\arcsin(cx)}{dx\,(d-c^2dx^2)^{3/2}}+\frac{4c^2x(a+b\arcsin(cx))}{3d\,(d-c^2dx^2)^{3/2}}+\frac{8c^2x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad -\frac{\left(bc\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(-\frac{3}{x}+\frac{c^2}{(-1+c^2x)^2}-\frac{5c^2}{-1+c^2x}\right)dx,x,x^2\right)}{6d^3\sqrt{1-c^2x^2}} \\
&= -\frac{bc\sqrt{d-c^2dx^2}}{6d^3\,(1-c^2x^2)^{3/2}}-\frac{a+b\arcsin(cx)}{dx\,(d-c^2dx^2)^{3/2}}+\frac{4c^2x(a+b\arcsin(cx))}{3d\,(d-c^2dx^2)^{3/2}} \\
&\quad +\frac{8c^2x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}+\frac{bc\sqrt{d-c^2dx^2}\log(x)}{d^3\sqrt{1-c^2x^2}}+\frac{5bc\sqrt{d-c^2dx^2}\log\left(1-c^2x^2\right)}{6d^3\sqrt{1-c^2x^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.51 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.06

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\Big(bcx-bc^3x^3+6a\sqrt{1-c^2x^2}-24ac^2x^2\sqrt{1-c^2x^2}+16ac^4x^4\sqrt{1-c^2x^2}+2b\sqrt{1-c^2x^2}(3-12}{}$$

[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d - c^2*d*x^2)^(5/2)),x]

[Out] -1/6*(Sqrt[d - c^2*d*x^2]*(b*c*x - b*c^3*x^3 + 6*a*Sqrt[1 - c^2*x^2] - 24*a*c^2*x^2*Sqrt[1 - c^2*x^2] + 16*a*c^4*x^4*Sqrt[1 - c^2*x^2] + 2*b*Sqrt[1 - c^2*x^2]*(3 - 12*c^2*x^2 + 8*c^4*x^4)*ArcSin[c*x] + 3*b*c*x*(-1 + c^2*x^2)^2*Log[1 - 1/(c^2*x^2)] - 8*b*c*x*Log[1 - c^2*x^2] + 16*b*c^3*x^3*Log[1 - c^2*x^2] - 8*b*c^5*x^5*Log[1 - c^2*x^2]))/(d^3*x*(1 - c^2*x^2)^(5/2))

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.21 (sec) , antiderivative size = 1346, normalized size of antiderivative = 6.01

method	result	size
default	Expression too large to display	1346
parts	Expression too large to display	1346

[In] int((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)

[Out] a*(-1/d/x/(-c^2*d*x^2+d)^(3/2)+4*c^2*(1/3/d*x/(-c^2*d*x^2+d)^(3/2)+2/3/d^2*x/(-c^2*d*x^2+d)^(1/2)))+9*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3/x*arcsin(c*x)+3/2*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*(-c^2*x^2+1)^(1/2)*c-4/3*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^2*(-c^2*x^2+1)^(1/2)*c^3-5/3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c-64/3*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^5*arcsin(c*x)*c^6+56*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*arcsin(c*x)*c^4-44*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*arcsin(c*x)*c^2-b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c+20*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*(-c^2*x^2+1)*c^4+4*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*c^2-24*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c-112/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^7*c^8-4*I*b*(-d*(c^2*x^2-1)

```
)^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*(-c^2*x^2+1)*c^2+136/3*I*
b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^2*(-c^2*
x^2+1)^(1/2)*arcsin(c*x)*c^3-80/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*
c^4*x^4+26*c^2*x^2-9)/d^3*x^5*(-c^2*x^2+1)*c^6-24*I*b*(-d*(c^2*x^2-1))^(1/2
)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*c^4+16/3*I*b*(-d*(c^2*x^2-1))
^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*arcsin(c*x)*c+32/3*I*b*(-d*(c^2*x
^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^9*c^10+140/3*I*b*(-d
*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^5*c^6+32/3*I*
b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^7*(-c^2*
x^2+1)*c^8-64/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2
-9)/d^3*x^4*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)^{5/2}}\,dx=\int \frac{b\arcsin(cx)+a}{(-c^2dx^2+d)^{\frac{5}{2}}x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^8 - 3*c^4*d^3
*x^6 + 3*c^2*d^3*x^4 - d^3*x^2), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)^{5/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(cx)}{x^2(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x**2/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral((a + b*asin(c*x))/(x**2*(-d*(c*x - 1)*(c*x + 1))**(5/2)), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^2(d-c^2dx^2)^{5/2}}\,dx=\int \frac{b\arcsin(cx)+a}{(-c^2dx^2+d)^{\frac{5}{2}}x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
[Out] 1/3*a*(8*c^2*x/(sqrt(-c^2*d*x^2 + d)*d^2) + 4*c^2*x/((-c^2*d*x^2 + d)^(3/2)
*d) - 3/((-c^2*d*x^2 + d)^(3/2)*d*x)) + b*integrate(arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))/((c^4*d^2*x^6 - 2*c^2*d^2*x^4 + d^2*x^2)*sqrt(c*x + 1)*
sqrt(-c*x + 1)), x)/sqrt(d)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*x^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^2\,\left(d-c^2\,d\,x^2\right)^{5/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^(5/2)),x)
[Out] int((a + b*asin(c*x))/(x^2*(d - c^2*d*x^2)^(5/2)), x)
```

3.138 $\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 433

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^{5/2}}\,dx &= \frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}\\
&\quad-\frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}\\
&\quad+\frac{5c^2(a+b\arcsin(cx))}{6d(d-c^2dx^2)^{3/2}}-\frac{a+b\arcsin(cx)}{2dx^2(d-c^2dx^2)^{3/2}}+\frac{5c^2(a+b\arcsin(cx))}{2d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{5c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}-\frac{13bc^2\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{6d^2\sqrt{d-c^2dx^2}}\\
&\quad+\frac{5ibc^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}}-\frac{5ibc^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] 5/6*c^2*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(3/2)+1/2*(-a-b*arcsin(c*x))/d/x
^2/(-c^2*d*x^2+d)^(3/2)+5/2*c^2*(a+b*arcsin(c*x))/d^2/(-c^2*d*x^2+d)^(1/2)+
1/4*b*c/d^2/x/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-5/12*b*c^3*x/d^2/(-c^
2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-3/4*b*c*(-c^2*x^2+1)^(1/2)/d^2/x/(-c^2*
d*x^2+d)^(1/2)-5*c^2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-
c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-13/6*b*c^2*arctanh(c*x)*(-c^2*x^2
+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)+5/2*I*b*c^2*polylog(2,-I*c*x-(-c^2*x^2+1
)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-5/2*I*b*c^2*polylog(2,
I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 433, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.370, Rules used = {4789, 4793, 4803, 4268, 2317, 2438, 212, 205, 296, 331}

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^{5/2}}\,dx = -\frac{5c^2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\arcsin(cx))}{2d^2\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\arcsin(cx))}{6d(d-c^2dx^2)^{3/2}} - \frac{a+b\arcsin(cx)}{2dx^2(d-c^2dx^2)^{3/2}} + \frac{5ibc^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}} - \frac{5ibc^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}} - \frac{13bc^2\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{6d^2\sqrt{d-c^2dx^2}} - \frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}} + \frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] (b*c)/(4*d^2*x*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (5*b*c^3*x)/(12*d^2
*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (3*b*c*Sqrt[1 - c^2*x^2])/(4*d^2*
x*Sqrt[d - c^2*d*x^2]) + (5*c^2*(a + b*ArcSin[c*x]))/(6*d*(d - c^2*d*x^2)^(
3/2)) - (a + b*ArcSin[c*x])/(2*d*x^2*(d - c^2*d*x^2)^(3/2)) + (5*c^2*(a + b
*ArcSin[c*x]))/(2*d^2*Sqrt[d - c^2*d*x^2]) - (5*c^2*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (13*
b*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[c*x])/(6*d^2*Sqrt[d - c^2*d*x^2]) + (((5*I)
/2)*b*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c
^2*d*x^2]) - (((5*I)/2)*b*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x]
)])/(d^2*Sqrt[d - c^2*d*x^2])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 296

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-(
c*x)^(m + 1))*((a + b*x^n)^(p + 1)/(a*c*n*(p + 1))), x] + Dist[(m + n*(p +
1) + 1)/(a*n*(p + 1)), Int[(c*x)^m*(a + b*x^n)^(p + 1), x], x] /; FreeQ[{a,
 b, c, m}, x] && IGtQ[n, 0] && LtQ[p, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
```

```
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx)}{2dx^2\left(d-c^2dx^2\right)^{3/2}} \\
&\quad+\frac{1}{2}\left(5c^2\right)\int\frac{a+b\arcsin(cx)}{x\left(d-c^2dx^2\right)^{5/2}}\,dx+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int\frac{1}{x^2(1-c^2x^2)^2}\,dx}{2d^2\sqrt{d-c^2dx^2}} \\
&=\frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{5c^2(a+b\arcsin(cx))}{6d\left(d-c^2dx^2\right)^{3/2}} \\
&\quad-\frac{a+b\arcsin(cx)}{2dx^2\left(d-c^2dx^2\right)^{3/2}}+\frac{\left(5c^2\right)\int\frac{a+b\arcsin(cx)}{x(d-c^2dx^2)^{3/2}}\,dx}{2d} \\
&\quad+\frac{\left(3bc\sqrt{1-c^2x^2}\right)\int\frac{1}{x^2(1-c^2x^2)}\,dx}{4d^2\sqrt{d-c^2dx^2}}-\frac{\left(5bc^3\sqrt{1-c^2x^2}\right)\int\frac{1}{(1-c^2x^2)^2}\,dx}{6d^2\sqrt{d-c^2dx^2}} \\
&=\frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&\quad-\frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}}+\frac{5c^2(a+b\arcsin(cx))}{6d\left(d-c^2dx^2\right)^{3/2}}-\frac{a+b\arcsin(cx)}{2dx^2\left(d-c^2dx^2\right)^{3/2}} \\
&\quad+\frac{5c^2(a+b\arcsin(cx))}{2d^2\sqrt{d-c^2dx^2}}+\frac{\left(5c^2\right)\int\frac{a+b\arcsin(cx)}{x\sqrt{d-c^2dx^2}}\,dx}{2d^2}-\frac{\left(5bc^3\sqrt{1-c^2x^2}\right)\int\frac{1}{1-c^2x^2}\,dx}{12d^2\sqrt{d-c^2dx^2}} \\
&\quad+\frac{\left(3bc^3\sqrt{1-c^2x^2}\right)\int\frac{1}{1-c^2x^2}\,dx}{4d^2\sqrt{d-c^2dx^2}}-\frac{\left(5bc^3\sqrt{1-c^2x^2}\right)\int\frac{1}{1-c^2x^2}\,dx}{2d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\arcsin(cx))}{6d\,(d-c^2dx^2)^{3/2}} - \frac{a+b\arcsin(cx)}{2dx^2\,(d-c^2dx^2)^{3/2}} \\
&\quad + \frac{5c^2(a+b\arcsin(cx))}{2d^2\sqrt{d-c^2dx^2}} - \frac{13bc^2\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{6d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(5c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \arcsin(cx)\right)}{2d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\arcsin(cx))}{6d\,(d-c^2dx^2)^{3/2}} - \frac{a+b\arcsin(cx)}{2dx^2\,(d-c^2dx^2)^{3/2}} \\
&\quad + \frac{5c^2(a+b\arcsin(cx))}{2d^2\sqrt{d-c^2dx^2}} - \frac{5c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{13bc^2\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{6d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(5bc^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{2d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(5bc^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{2d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\arcsin(cx))}{6d\,(d-c^2dx^2)^{3/2}} - \frac{a+b\arcsin(cx)}{2dx^2\,(d-c^2dx^2)^{3/2}} \\
&\quad + \frac{5c^2(a+b\arcsin(cx))}{2d^2\sqrt{d-c^2dx^2}} - \frac{5c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{13bc^2\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{6d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(5ibc^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(5ibc^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= \frac{bc}{4d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{5bc^3x}{12d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{3bc\sqrt{1-c^2x^2}}{4d^2x\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\arcsin(cx))}{6d(d-c^2dx^2)^{3/2}} - \frac{a+b\arcsin(cx)}{2dx^2(d-c^2dx^2)^{3/2}} + \frac{5c^2(a+b\arcsin(cx))}{2d^2\sqrt{d-c^2dx^2}} - \frac{5c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} - \frac{13bc^2\sqrt{1-c^2x^2}\text{arctanh}(cx)}{6d^2\sqrt{d-c^2dx^2}} + \frac{5ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}} - \frac{5ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 7.35 (sec) , antiderivative size = 537, normalized size of antiderivative = 1.24

$$\int \frac{a+b\arcsin(cx)}{x^3(d-c^2dx^2)^{5/2}}\,dx = \sqrt{-d(-1+c^2x^2)}\left(-\frac{a}{2d^3x^2} + \frac{ac^2}{3d^3(-1+c^2x^2)^2} - \frac{2ac^2}{d^3(-1+c^2x^2)}\right) + \frac{5ac^2\log(x)}{2d^{5/2}} - \frac{5ac^2\log\left(d+\sqrt{d}\sqrt{-d(-1+c^2x^2)}\right)}{2d^{5/2}} + \frac{bc^2\sqrt{1-c^2x^2}\left(-\frac{2(-1+\arcsin(cx))}{-1+cx} + 52\arcsin(cx) - 6\cot\left(\frac{1}{2}\arcsin(cx)\right) - 3\arcsin(cx)\csc^2\left(\frac{1}{2}\arcsin(cx)\right) + \cdots\right.}{\cdots}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*(-1/2*a/(d^3*x^2) + (a*c^2)/(3*d^3*(-1 + c^2*x^2)
^2) - (2*a*c^2)/(d^3*(-1 + c^2*x^2))) + (5*a*c^2*Log[x])/(2*d^(5/2)) - (5*a
*c^2*Log[d + Sqrt[d]*Sqrt[-(d*(-1 + c^2*x^2))]])/(2*d^(5/2)) + (b*c^2*Sqrt[
1 - c^2*x^2]*((-2*(-1 + ArcSin[c*x]))/(-1 + c*x) + 52*ArcSin[c*x] - 6*Cot[A
rcSin[c*x]/2] - 3*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 + 60*ArcSin[c*x]*(Log[1
- E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) + 52*Log[Cos[ArcSin[c*x]
/2] - Sin[ArcSin[c*x]/2]] - 52*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]
 + (60*I)*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])])
+ 3*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + (4*ArcSin[c*x]*Sin[ArcSin[c*x]/2])/(
Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + (52*ArcSin[c*x]*Sin[ArcSin[c*x
]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (4*ArcSin[c*x]*Sin[ArcSin
[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (2*(1 + ArcSin[c*x]
))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (52*ArcSin[c*x]*Sin[ArcSin
[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 6*Tan[ArcSin[c*x]/2])
)/(24*d^2*Sqrt[d*(1 - c^2*x^2)])
```

Maple [A] (verified)

Time = 0.27 (sec) , antiderivative size = 605, normalized size of antiderivative = 1.40

method	result
default	$-\frac{a}{2d\,x^{2}\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}}+\frac{5a\,c^{2}}{6d\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}}+\frac{5a\,c^{2}}{2d^{2}\sqrt{-c^{2}d\,x^{2}+d}}-\frac{5a\,c^{2}\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^{2}d\,x^{2}+d}}{x}\right)}{2d^{\frac{5}{2}}}-\frac{ib\sqrt{-d\left(c^{2}x^{2}-1\right)}\,\sqrt{-c^{2}x^{2}+}}{}$
parts	$-\frac{a}{2d\,x^{2}\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}}+\frac{5a\,c^{2}}{6d\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}}+\frac{5a\,c^{2}}{2d^{2}\sqrt{-c^{2}d\,x^{2}+d}}-\frac{5a\,c^{2}\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^{2}d\,x^{2}+d}}{x}\right)}{2d^{\frac{5}{2}}}-\frac{ib\sqrt{-d\left(c^{2}x^{2}-1\right)}\,\sqrt{-c^{2}x^{2}+}}{}$

```
[In] int((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/d/x^2/(-c^2*d*x^2+d)^(3/2)+5/6*a*c^2/d/(-c^2*d*x^2+d)^(3/2)+5/2*a*c^
2/d^2/(-c^2*d*x^2+d)^(1/2)-5/2*a*c^2/d^(5/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+
d)^(1/2))/x)-1/6*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(-5*I*x^3*c^
3+15*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))*c^6*x^6+15*dilog(I*c*x+(-c^2*x^2+1)^
(1/2))*c^6*x^6+26*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*c^6*x^6+3*I*(-c^2*x^2+1)
^(1/2)*arcsin(c*x)+15*I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))*x^2*c^2-
20*I*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2*c^2-30*dilog(1+I*c*x+(-c^2*x^2+1)^(
1/2))*c^4*x^4-30*dilog(I*c*x+(-c^2*x^2+1)^(1/2))*c^4*x^4-52*arctan(I*c*x+(-
c^2*x^2+1)^(1/2))*c^4*x^4+2*I*x^5*c^5+15*I*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x
^4*c^4+3*I*c*x+15*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))*c^2*x^2+15*dilog(I*c*x+
(-c^2*x^2+1)^(1/2))*c^2*x^2+26*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*c^2*x^2-30*
I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))*x^4*c^4+15*I*arcsin(c*x)*ln(1+
I*c*x+(-c^2*x^2+1)^(1/2))*x^6*c^6)/d^3/(c^6*x^6-3*c^4*x^4+3*c^2*x^2-1)/x^2
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^9 - 3*c^4*d^3
*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{a+b\,\mathrm{asin}\,(cx)}{x^3\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x**3/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral((a + b*asin(c*x))/(x**3*(-d*(c*x - 1)*(c*x + 1))**(5/2)), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
[Out] -1/6*a*(15*c^2*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^(5
/2) - 15*c^2/(sqrt(-c^2*d*x^2 + d)*d^2) - 5*c^2/((-c^2*d*x^2 + d)^(3/2)*d)
+ 3/((-c^2*d*x^2 + d)^(3/2)*d*x^2)) + b*integrate(arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))/((c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3)*sqrt(c*x + 1)*sq
rt(-c*x + 1)), x)/sqrt(d)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*x^3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^3\,{\left(d-c^2\,d\,x^2\right)}^{5/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^(5/2)),x)
[Out] int((a + b*asin(c*x))/(x^3*(d - c^2*d*x^2)^(5/2)), x)
```

3.139 $\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 310

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^{5/2}}\,dx &= -\frac{bc^3\sqrt{d-c^2dx^2}}{6d^3\left(1-c^2x^2\right)^{3/2}}-\frac{bc\sqrt{d-c^2dx^2}}{6d^3x^2\sqrt{1-c^2x^2}}\\ &-\frac{a+b\arcsin(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}}-\frac{2c^2(a+b\arcsin(cx))}{dx\left(d-c^2dx^2\right)^{3/2}}+\frac{8c^4x(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}\\ &+\frac{16c^4x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}+\frac{8bc^3\sqrt{d-c^2dx^2}\log(x)}{3d^3\sqrt{1-c^2x^2}}+\frac{4bc^3\sqrt{d-c^2dx^2}\log\left(1-c^2x^2\right)}{3d^3\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] 1/3*(-a-b*arcsin(c*x))/d/x^3/(-c^2*d*x^2+d)^(3/2)-2*c^2*(a+b*arcsin(c*x))/d
/x/(-c^2*d*x^2+d)^(3/2)+8/3*c^4*x*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(3/2)+
16/3*c^4*x*(a+b*arcsin(c*x))/d^2/(-c^2*d*x^2+d)^(1/2)-1/6*b*c^3*(-c^2*d*x^2
+d)^(1/2)/d^3/(-c^2*x^2+1)^(3/2)-1/6*b*c*(-c^2*d*x^2+d)^(1/2)/d^3/x^2/(-c^2
*x^2+1)^(1/2)+8/3*b*c^3*ln(x)*(-c^2*d*x^2+d)^(1/2)/d^3/(-c^2*x^2+1)^(1/2)+4
/3*b*c^3*ln(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 310, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {277, 198, 197, 4779, 12, 1813, 1634}

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x^4\left(d-c^2dx^2\right)^{5/2}}\,dx &= -\frac{2c^2(a+b\arcsin(cx))}{dx\left(d-c^2dx^2\right)^{3/2}}-\frac{a+b\arcsin(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}}\\ &+\frac{16c^4x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}+\frac{8c^4x(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{bc\sqrt{d-c^2dx^2}}{6d^3x^2\sqrt{1-c^2x^2}}\\ &-\frac{bc^3\sqrt{d-c^2dx^2}}{6d^3\left(1-c^2x^2\right)^{3/2}}+\frac{8bc^3\log(x)\sqrt{d-c^2dx^2}}{3d^3\sqrt{1-c^2x^2}}+\frac{4bc^3\sqrt{d-c^2dx^2}\log\left(1-c^2x^2\right)}{3d^3\sqrt{1-c^2x^2}}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/6*(b*c^3*Sqrt[d - c^2*d*x^2])/(d^3*(1 - c^2*x^2)^(3/2)) - (b*c*Sqrt[d -
c^2*d*x^2])/(6*d^3*x^2*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*x])/(3*d*x^3*(d
 - c^2*d*x^2)^(3/2)) - (2*c^2*(a + b*ArcSin[c*x]))/(d*x*(d - c^2*d*x^2)^(3/
2)) + (8*c^4*x*(a + b*ArcSin[c*x]))/(3*d*(d - c^2*d*x^2)^(3/2)) + (16*c^4*x
*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c^2*d*x^2]) + (8*b*c^3*Sqrt[d - c^2*d
*x^2]*Log[x])/(3*d^3*Sqrt[1 - c^2*x^2]) + (4*b*c^3*Sqrt[d - c^2*d*x^2]*Log[
1 - c^2*x^2])/(3*d^3*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}}-\frac{2c^2(a+b\arcsin(cx))}{dx\left(d-c^2dx^2\right)^{3/2}}+\frac{8c^4x(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}\\
&\quad+\frac{16c^4x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-1-6c^2x^2+24c^4x^4-16c^6x^6}{3d^3x^3\left(1-c^2x^2\right)^2}\,dx}{\sqrt{1-c^2x^2}}\\
&= -\frac{a+b\arcsin(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}}-\frac{2c^2(a+b\arcsin(cx))}{dx\left(d-c^2dx^2\right)^{3/2}}+\frac{8c^4x(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}\\
&\quad+\frac{16c^4x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{-1-6c^2x^2+24c^4x^4-16c^6x^6}{x^3\left(1-c^2x^2\right)^2}\,dx}{3d^3\sqrt{1-c^2x^2}}\\
&= -\frac{a+b\arcsin(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}}-\frac{2c^2(a+b\arcsin(cx))}{dx\left(d-c^2dx^2\right)^{3/2}}\\
&\quad+\frac{8c^4x(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{16c^4x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{-1-6c^2x+24c^4x^2-16c^6x^3}{x^2\left(1-c^2x\right)^2}\,dx,x,x^2\right)}{6d^3\sqrt{1-c^2x^2}}\\
&= -\frac{a+b\arcsin(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}}-\frac{2c^2(a+b\arcsin(cx))}{dx\left(d-c^2dx^2\right)^{3/2}}\\
&\quad+\frac{8c^4x(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{16c^4x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(-\frac{1}{x^2}-\frac{8c^2}{x}+\frac{c^4}{\left(-1+c^2x\right)^2}-\frac{8c^4}{-1+c^2x}\right)\,dx,x,x^2\right)}{6d^3\sqrt{1-c^2x^2}}\\
&= -\frac{bc^3\sqrt{d-c^2dx^2}}{6d^3\left(1-c^2x^2\right)^{3/2}}-\frac{bc\sqrt{d-c^2dx^2}}{6d^3x^2\sqrt{1-c^2x^2}}-\frac{a+b\arcsin(cx)}{3dx^3\left(d-c^2dx^2\right)^{3/2}}\\
&\quad-\frac{2c^2(a+b\arcsin(cx))}{dx\left(d-c^2dx^2\right)^{3/2}}+\frac{8c^4x(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{16c^4x(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}\\
&\quad+\frac{8bc^3\sqrt{d-c^2dx^2}\log(x)}{3d^3\sqrt{1-c^2x^2}}+\frac{4bc^3\sqrt{d-c^2dx^2}\log\left(1-c^2x^2\right)}{3d^3\sqrt{1-c^2x^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 277, normalized size of antiderivative = 0.89

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)^{5/2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\Big(bcx-bc^3x^3+2a\sqrt{1-c^2x^2}+12ac^2x^2\sqrt{1-c^2x^2}-48ac^4x^4\sqrt{1-c^2x^2}+32ac^6x^6\sqrt{1-c^2x^2}-}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/6*(Sqrt[d - c^2*d*x^2]*(b*c*x - b*c^3*x^3 + 2*a*Sqrt[1 - c^2*x^2] + 12*a
*c^2*x^2*Sqrt[1 - c^2*x^2] - 48*a*c^4*x^4*Sqrt[1 - c^2*x^2] + 32*a*c^6*x^6*
Sqrt[1 - c^2*x^2] + 2*b*Sqrt[1 - c^2*x^2]*(1 + 6*c^2*x^2 - 24*c^4*x^4 + 16*
c^6*x^6)*ArcSin[c*x] + 8*b*c^3*x^3*(-1 + c^2*x^2)^2*Log[1 - 1/(c^2*x^2)] -
16*b*c^3*x^3*Log[1 - c^2*x^2] + 32*b*c^5*x^5*Log[1 - c^2*x^2] - 16*b*c^7*x^
7*Log[1 - c^2*x^2]))/(d^3*x^3*(1 - c^2*x^2)^(5/2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.21 (sec) , antiderivative size = 1877, normalized size of antiderivative = 6.05

method	result	size
default	Expression too large to display	1877
parts	Expression too large to display	1877

```
[In] int((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -64*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2
-1)/d^3*x^6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^9+128*I*b*(-d*(c^2*x^2-1))^(1/
2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^4*arcsin(c*x)*(-c^
2*x^2+1)^(1/2)*c^7-176/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+
35*c^4*x^4-10*c^2*x^2-1)/d^3*x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^5+2*b*(-d
*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*c^3
*(-c^2*x^2+1)^(1/2)+1/3*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*
c^4*x^4-10*c^2*x^2-1)/d^3/x^3*arcsin(c*x)+a*(-1/3/d/x^3/(-c^2*d*x^2+d)^(3/2
)+2*c^2*(-1/d/x/(-c^2*d*x^2+d)^(3/2)+4*c^2*(1/3/d*x/(-c^2*d*x^2+d)^(3/2)+2/
3/d^2*x/(-c^2*d*x^2+d)^(1/2))))-8/3*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(
1/2)/d^3/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^4-1)*c^3-64*b*(-d*(c^2*x
^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^7*arcsin
(c*x)*c^10+160*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-1
0*c^2*x^2-1)/d^3*x^5*arcsin(c*x)*c^8-344/3*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8
*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^3*arcsin(c*x)*c^6-2*b*(-d*(c
```

```
^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^2*c^
5*(-c^2*x^2+1)^(1/2)+12*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*
c^4*x^4-10*c^2*x^2-1)/d^3*x*arcsin(c*x)*c^4+6*b*(-d*(c^2*x^2-1))^(1/2)/(12*
c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3/x*arcsin(c*x)*c^2-280/3*I*b
*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3
*x^5*c^8+32/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-
10*c^2*x^2-1)/d^3*x^3*c^6+8/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6
*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x*c^4+128/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(1
2*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^11*c^14-448/3*I*b*(-d*(
c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^9*c
^12+560/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c
^2*x^2-1)/d^3*x^7*c^10+1/6*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+
35*c^4*x^4-10*c^2*x^2-1)/d^3/x^2*(-c^2*x^2+1)^(1/2)*c-16/3*I*b*(-d*(c^2*x^2
-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*arcsin(c*x)*
(-c^2*x^2+1)^(1/2)*c^3+32/3*I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d
^3/(c^2*x^2-1)*arcsin(c*x)*c^3-40/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-
36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^3*(-c^2*x^2+1)*c^6-8/3*I*b*(-d*(c
^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x*(-c^
2*x^2+1)*c^4+80*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^
4-10*c^2*x^2-1)/d^3*x^5*(-c^2*x^2+1)*c^8+128/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(
12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2-1)/d^3*x^9*(-c^2*x^2+1)*c^12-32
0/3*I*b*(-d*(c^2*x^2-1))^(1/2)/(12*c^8*x^8-36*c^6*x^6+35*c^4*x^4-10*c^2*x^2
-1)/d^3*x^7*(-c^2*x^2+1)*c^10
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)^{5/2}}\,dx = \int \frac{b\arcsin(cx)+a}{(-c^2dx^2+d)^{\frac{5}{2}}x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*x^10 - 3*c^4*d^
3*x^8 + 3*c^2*d^3*x^6 - d^3*x^4), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)^{5/2}}\,dx = \int \frac{a+b\operatorname{asin}(cx)}{x^4(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x**4/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral((a + b*asin(c*x))/(x**4*(-d*(c*x - 1)*(c*x + 1))**(5/2)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 255, normalized size of antiderivative = 0.82

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)^{5/2}}\,dx = \frac{1}{6}bc\left(\frac{8c^2\log(cx+1)}{d^{\frac{5}{2}}}+\frac{8c^2\log(cx-1)}{d^{\frac{5}{2}}}+\frac{16c^2\log(x)}{d^{\frac{5}{2}}}+\frac{1}{c^2d^{\frac{5}{2}}x^4-d^{\frac{5}{2}}x^2}\right)$$
$$+\frac{1}{3}\left(\frac{16c^4x}{\sqrt{-c^2dx^2+d}d^2}+\frac{8c^4x}{(-c^2dx^2+d)^{\frac{3}{2}}d}-\frac{6c^2}{(-c^2dx^2+d)^{\frac{3}{2}}dx}-\frac{1}{(-c^2dx^2+d)^{\frac{3}{2}}dx^3}\right)b\arcsin(cx)$$
$$+\frac{1}{3}\left(\frac{16c^4x}{\sqrt{-c^2dx^2+d}d^2}+\frac{8c^4x}{(-c^2dx^2+d)^{\frac{3}{2}}d}-\frac{6c^2}{(-c^2dx^2+d)^{\frac{3}{2}}dx}-\frac{1}{(-c^2dx^2+d)^{\frac{3}{2}}dx^3}\right)a$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/6*b*c*(8*c^2*log(c*x + 1)/d^(5/2) + 8*c^2*log(c*x - 1)/d^(5/2) + 16*c^2*l
og(x)/d^(5/2) + 1/(c^2*d^(5/2)*x^4 - d^(5/2)*x^2)) + 1/3*(16*c^4*x/(sqrt(-c
^2*d*x^2 + d)*d^2) + 8*c^4*x/((-c^2*d*x^2 + d)^(3/2)*d) - 6*c^2/((-c^2*d*x^
2 + d)^(3/2)*d*x) - 1/((-c^2*d*x^2 + d)^(3/2)*d*x^3))*b*arcsin(c*x) + 1/3*(
16*c^4*x/(sqrt(-c^2*d*x^2 + d)*d^2) + 8*c^4*x/((-c^2*d*x^2 + d)^(3/2)*d) -
6*c^2/((-c^2*d*x^2 + d)^(3/2)*d*x) - 1/((-c^2*d*x^2 + d)^(3/2)*d*x^3))*a
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)^{5/2}}\,dx = \int \frac{b\arcsin(cx)+a}{(-c^2dx^2+d)^{\frac{5}{2}}x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*x^4), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^4(d-c^2dx^2)^{5/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{x^4\,(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x^4*(d - c^2*d*x^2)^(5/2)), x)
```

3.140 $\int \frac{\arcsin(ax)}{(c-a^2cx^2)^{7/2}}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 210

$$\int \frac{\arcsin(ax)}{(c-a^2cx^2)^{7/2}}\,dx = -\frac{1}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{5c(c-a^2cx^2)^{5/2}} + \frac{4x\arcsin(ax)}{15c^2(c-a^2cx^2)^{3/2}} + \frac{8x\arcsin(ax)}{15c^3\sqrt{c-a^2cx^2}} + \frac{4\sqrt{1-a^2x^2}\log(1-a^2x^2)}{15ac^3\sqrt{c-a^2cx^2}}$$

```
[Out] 1/5*x*arcsin(a*x)/c/(-a^2*c*x^2+c)^(5/2)+4/15*x*arcsin(a*x)/c^2/(-a^2*c*x^2
+c)^(3/2)-1/20/a/c^3/(-a^2*x^2+1)^(3/2)/(-a^2*c*x^2+c)^(1/2)+8/15*x*arcsin(
a*x)/c^3/(-a^2*c*x^2+c)^(1/2)-2/15/a/c^3/(-a^2*x^2+1)^(1/2)/(-a^2*c*x^2+c)^
(1/2)+4/15*ln(-a^2*x^2+1)*(-a^2*x^2+1)^(1/2)/a/c^3/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 210, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4747, 4745, 266, 267}

$$\int \frac{\arcsin(ax)}{(c-a^2cx^2)^{7/2}}\,dx = \frac{8x\arcsin(ax)}{15c^3\sqrt{c-a^2cx^2}} + \frac{4x\arcsin(ax)}{15c^2(c-a^2cx^2)^{3/2}} + \frac{x\arcsin(ax)}{5c(c-a^2cx^2)^{5/2}} - \frac{2}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} - \frac{1}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} + \frac{4\sqrt{1-a^2x^2}\log(1-a^2x^2)}{15ac^3\sqrt{c-a^2cx^2}}$$

```
[In] Int[ArcSin[a*x]/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] -1/20*1/(a*c^3*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]) - 2/(15*a*c^3*Sqrt[
1 - a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x])/(5*c*(c - a^2*c*x^2)^(5
/2)) + (4*x*ArcSin[a*x])/(15*c^2*(c - a^2*c*x^2)^(3/2)) + (8*x*ArcSin[a*x])
/(15*c^3*Sqrt[c - a^2*c*x^2]) + (4*Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2])/(15*
a*c^3*Sqrt[c - a^2*c*x^2])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x\arcsin(ax)}{5c\left(c-a^2cx^2\right)^{5/2}}+\frac{4\int\frac{\arcsin(ax)}{(c-a^2cx^2)^{5/2}}\,dx}{5c}-\frac{\left(a\sqrt{1-a^2x^2}\right)\int\frac{x}{(1-a^2x^2)^3}\,dx}{5c^3\sqrt{c-a^2cx^2}}\\
&= -\frac{1}{20ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}}+\frac{x\arcsin(ax)}{5c\left(c-a^2cx^2\right)^{5/2}}\\
&\quad+\frac{4x\arcsin(ax)}{15c^2\left(c-a^2cx^2\right)^{3/2}}+\frac{8\int\frac{\arcsin(ax)}{(c-a^2cx^2)^{3/2}}\,dx}{15c^2}-\frac{\left(4a\sqrt{1-a^2x^2}\right)\int\frac{x}{(1-a^2x^2)^2}\,dx}{15c^3\sqrt{c-a^2cx^2}}
\end{aligned}$$

$$= -\frac{1}{20ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{5c\left(c-a^2cx^2\right)^{5/2}} + \frac{4x\arcsin(ax)}{15c^2\left(c-a^2cx^2\right)^{3/2}} + \frac{8x\arcsin(ax)}{15c^3\sqrt{c-a^2cx^2}} - \frac{\left(8a\sqrt{1-a^2x^2}\right)\int\frac{x}{1-a^2x^2}\,dx}{15c^3\sqrt{c-a^2cx^2}}$$

$$= -\frac{1}{20ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{5c\left(c-a^2cx^2\right)^{5/2}} + \frac{4x\arcsin(ax)}{15c^2\left(c-a^2cx^2\right)^{3/2}} + \frac{8x\arcsin(ax)}{15c^3\sqrt{c-a^2cx^2}} + \frac{4\sqrt{1-a^2x^2}\log\left(1-a^2x^2\right)}{15ac^3\sqrt{c-a^2cx^2}}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.53

$$\int\frac{\arcsin(ax)}{\left(c-a^2cx^2\right)^{7/2}}\,dx = -\frac{\sqrt{c-a^2cx^2}\left(4ax(15-20a^2x^2+8a^4x^4)\arcsin(ax)+\sqrt{1-a^2x^2}\left(-11+8a^2x^2+16(-1+a^2x^2)^2\log\left(-1+\right.\right.\right.}{60ac^4\left(-1+a^2x^2\right)^3}$$

```
[In] Integrate[ArcSin[a*x]/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] -1/60*(Sqrt[c - a^2*c*x^2]*(4*a*x*(15 - 20*a^2*x^2 + 8*a^4*x^4)*ArcSin[a*x]
 + Sqrt[1 - a^2*x^2]*(-11 + 8*a^2*x^2 + 16*(-1 + a^2*x^2)^2*Log[-1 + a^2*x^
2])))/(a*c^4*(-1 + a^2*x^2)^3)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.29 (sec) , antiderivative size = 409, normalized size of antiderivative = 1.95

method	result
default	$\frac{16i\sqrt{-c(a^2x^2-1)}\sqrt{-a^2x^2+1}\arcsin(ax)}{15a\,c^4(a^2x^2-1)} - \frac{\sqrt{-c(a^2x^2-1)}\left(8a^5x^5-20a^3x^3+8i\sqrt{-a^2x^2+1}\,a^4x^4+15ax-16i\sqrt{-a^2x^2+1}\,a^2x^2+8i\sqrt{-\right.}{}$

```
[In] int(arcsin(a*x)/(-a^2*c*x^2+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 16/15*I*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^4/(a^2*x^2-1)*arcsin(
a*x)-1/60*(-c*(a^2*x^2-1))^(1/2)*(8*a^5*x^5-20*a^3*x^3+8*I*(-a^2*x^2+1)^(1/
2)*a^4*x^4+15*a*x-16*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+8*I*(-a^2*x^2+1)^(1/2))*(
64*I*a^8*x^8+64*(-a^2*x^2+1)^(1/2)*a^7*x^7-280*I*a^6*x^6-248*(-a^2*x^2+1)^(
1/2)*a^5*x^5+160*a^4*x^4*arcsin(a*x)+456*I*a^4*x^4+340*a^3*x^3*(-a^2*x^2+1)
^(1/2)-380*a^2*x^2*arcsin(a*x)-328*I*a^2*x^2-165*a*x*(-a^2*x^2+1)^(1/2)+256
```

```
*arcsin(a*x)+88*I)/c^4/(40*a^10*x^10-215*a^8*x^8+469*a^6*x^6-517*a^4*x^4+28
7*a^2*x^2-64)/a-8/15*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^4/(a^2*x
^2-1)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)
```

Fricas [F]

$$\int \frac{\arcsin(ax)}{(c-a^2cx^2)^{7/2}}\,dx = \int \frac{\arcsin(ax)}{(-a^2cx^2+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)/(-a^2*c*x^2+c)^(7/2),x, algorithm="fricas")
[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)/(a^8*c^4*x^8 - 4*a^6*c^4*x^6 + 6*
a^4*c^4*x^4 - 4*a^2*c^4*x^2 + c^4), x)
```

Sympy [F]

$$\int \frac{\arcsin(ax)}{(c-a^2cx^2)^{7/2}}\,dx = \int \frac{\operatorname{asin}(ax)}{(-c(ax-1)(ax+1))^{\frac{7}{2}}}\,dx$$

```
[In] integrate(asin(a*x)/(-a**2*c*x**2+c)**(7/2),x)
[Out] Integral(asin(a*x)/(-c*(a*x - 1)*(a*x + 1))**(7/2), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.71

$$\int \frac{\arcsin(ax)}{(c-a^2cx^2)^{7/2}}\,dx = -\frac{1}{60}a\left(\frac{3}{\left(a^6c^{\frac{5}{2}}x^4-2a^4c^{\frac{5}{2}}x^2+a^2c^{\frac{5}{2}}\right)c}-\frac{8}{\left(a^4c^{\frac{3}{2}}x^2-a^2c^{\frac{3}{2}}\right)c^2}+\frac{16\log\left(x^2-\frac{1}{a^2}\right)}{a^2c^{\frac{7}{2}}}\right)+\frac{1}{15}\left(\frac{8x}{\sqrt{-a^2cx^2+c}c^3}+\frac{4x}{(-a^2cx^2+c)^{\frac{3}{2}}c^2}+\frac{3x}{(-a^2cx^2+c)^{\frac{5}{2}}c}\right)\arcsin(ax)$$

```
[In] integrate(arcsin(a*x)/(-a^2*c*x^2+c)^(7/2),x, algorithm="maxima")
[Out] -1/60*a*(3/((a^6*c^(5/2)*x^4 - 2*a^4*c^(5/2)*x^2 + a^2*c^(5/2))*c) - 8/((a^
4*c^(3/2)*x^2 - a^2*c^(3/2))*c^2) + 16*log(x^2 - 1/a^2)/(a^2*c^(7/2))) + 1/
15*(8*x/(sqrt(-a^2*c*x^2 + c)*c^3) + 4*x/((-a^2*c*x^2 + c)^(3/2)*c^2) + 3*x
/((-a^2*c*x^2 + c)^(5/2)*c))*arcsin(a*x)
```

Giac [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 128, normalized size of antiderivative = 0.61

$$\int \frac{\arcsin(ax)}{(c-a^2cx^2)^{7/2}}\,dx = -\frac{1}{60}\sqrt{c}\left(\frac{16\log\left(|a^2x^2-1|\right)}{ac^4} - \frac{24\,a^4x^4-56\,a^2x^2+35}{(a^2x^2-1)^2ac^4}\right) - \frac{\sqrt{-a^2cx^2+c}\left(4\left(\frac{2\,a^4x^2}{c}-\frac{5\,a^2}{c}\right)x^2+\frac{15}{c}\right)x\arcsin\left(ax\right)}{15\left(a^2cx^2-c\right)^3}$$

```
[In] integrate(arcsin(a*x)/(-a^2*c*x^2+c)^(7/2),x, algorithm="giac")
[Out] -1/60*sqrt(c)*(16*log(abs(a^2*x^2 - 1))/(a*c^4) - (24*a^4*x^4 - 56*a^2*x^2
+ 35)/((a^2*x^2 - 1)^2*a*c^4)) - 1/15*sqrt(-a^2*c*x^2 + c)*(4*(2*a^4*x^2/c
- 5*a^2/c)*x^2 + 15/c)*x*arcsin(a*x)/(a^2*c*x^2 - c)^3
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)}{(c-a^2cx^2)^{7/2}}\,dx = \int \frac{\mathrm{asin}(a\,x)}{(c-a^2\,c\,x^2)^{7/2}}\,dx$$

```
[In] int(asin(a*x)/(c - a^2*c*x^2)^(7/2),x)
[Out] int(asin(a*x)/(c - a^2*c*x^2)^(7/2), x)
```

3.141 $\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 79

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx = \frac{2(fx)^{5/2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)}{5f} - \frac{4bc(fx)^{7/2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};c^2x^2\right)}{35f^2}$$

```
[Out] 2/5*(f*x)^(5/2)*(a+b*arcsin(c*x))*hypergeom([1/2, 5/4],[9/4],c^2*x^2)/f-4/3
5*b*c*(f*x)^(7/2)*hypergeom([1, 7/4, 7/4],[9/4, 11/4],c^2*x^2)/f^2
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.033, Rules used = {4805}

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx = \frac{2(fx)^{5/2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)(a+b\arcsin(cx))}{5f} - \frac{4bc(fx)^{7/2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};c^2x^2\right)}{35f^2}$$

```
[In] Int[((f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2],x]
```

```
[Out] (2*(f*x)^(5/2)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, 5/4, 9/4, c^2*x^2
])/(5*f) - (4*b*c*(f*x)^(7/2)*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4, 11/4},
 c^2*x^2])/(35*f^2)
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
```

```
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\text{integral} = \frac{2(fx)^{5/2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)}{5f} - \frac{4bc(fx)^{7/2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};c^2x^2\right)}{35f^2}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.86

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx = \frac{2}{35}x(fx)^{3/2}\left(7(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)-2bcx\right.$$

```
[In] Integrate[((f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2],x]
```

```
[Out] (2*x*(f*x)^(3/2)*(7*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, 5/4, 9/4, c^
2*x^2] - 2*b*c*x*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4, 11/4}, c^2*x^2]))/3
5
```

Maple [F]

$$\int \frac{(fx)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)}{\sqrt{-c^2x^2+1}}dx$$

```
[In] int((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

```
[Out] int((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Fricas [F]

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(fx)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)}{\sqrt{-c^2x^2+1}}\,dx$$

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fr
icas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*(b*f*x*arcsin(c*x) + a*f*x)*sqrt(f*x)/(c^2*x^2
 - 1), x)
```

Sympy [F]

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(fx)^{\frac{3}{2}}\,(a+b\operatorname{asin}{(cx)})}{\sqrt{-(cx-1)\,(cx+1)}}\,dx$$

```
[In] integrate((f*x)**(3/2)*(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
[Out] Integral((f*x)**(3/2)*(a + b*asin(c*x))/sqrt(-(c*x - 1)*(c*x + 1)), x)
```

Maxima [F]

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(fx)^{\frac{3}{2}}\,(b\arcsin{(cx)}+a)}{\sqrt{-c^2x^2+1}}\,dx$$

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="ma
xima")
[Out] integrate((f*x)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c^2*x^2 + 1), x)
```

Giac [F]

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(fx)^{\frac{3}{2}}\,(b\arcsin{(cx)}+a)}{\sqrt{-c^2x^2+1}}\,dx$$

```
[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="gi
ac")
[Out] integrate((f*x)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c^2*x^2 + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(a+b\operatorname{asin}(c\,x))\,{(f\,x)}^{3/2}}{\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f*x)^(3/2))/(1 - c^2*x^2)^(1/2),x)
[Out] int(((a + b*asin(c*x))*(f*x)^(3/2))/(1 - c^2*x^2)^(1/2), x)
```

3.142 $\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 137

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{2(fx)^{5/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)}{5f\sqrt{d-c^2dx^2}} - \frac{4bc(fx)^{7/2}\sqrt{1-c^2x^2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};c^2x^2\right)}{35f^2\sqrt{d-c^2dx^2}}$$

```
[Out] 2/5*(f*x)^(5/2)*(a+b*arcsin(c*x))*hypergeom([1/2, 5/4],[9/4],c^2*x^2)*(-c^2
*x^2+1)^(1/2)/f/(-c^2*d*x^2+d)^(1/2)-4/35*b*c*(f*x)^(7/2)*hypergeom([1, 7/4
, 7/4],[9/4, 11/4],c^2*x^2)*(-c^2*x^2+1)^(1/2)/f^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.032$, Rules used = {4805}

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{2\sqrt{1-c^2x^2}(fx)^{5/2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)(a+b\arcsin(cx))}{5f\sqrt{d-c^2dx^2}} - \frac{4bc\sqrt{1-c^2x^2}(fx)^{7/2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};c^2x^2\right)}{35f^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[((f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (2*(f*x)^(5/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2,
 5/4, 9/4, c^2*x^2])/(5*f*Sqrt[d - c^2*d*x^2]) - (4*b*c*(f*x)^(7/2)*Sqrt[1
- c^2*x^2]*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4, 11/4}, c^2*x^2])/(35*f^2*
Sqrt[d - c^2*d*x^2])
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\text{integral} = \frac{2(fx)^{5/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)}{5f\sqrt{d-c^2dx^2}} - \frac{4bc(fx)^{7/2}\sqrt{1-c^2x^2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};c^2x^2\right)}{35f^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 97, normalized size of antiderivative = 0.71

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = -\frac{2x(fx)^{3/2}\sqrt{1-c^2x^2}\left(-7(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2x^2\right)+2bcx\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};c^2x\right.}{35\sqrt{d-c^2dx^2}}$$

```
[In] Integrate[((f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (-2*x*(f*x)^(3/2)*Sqrt[1 - c^2*x^2]*(-7*(a + b*ArcSin[c*x])*Hypergeometric2
F1[1/2, 5/4, 9/4, c^2*x^2] + 2*b*c*x*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4,
 11/4}, c^2*x^2]))/(35*Sqrt[d - c^2*d*x^2])
```

Maple [F]

$$\int \frac{(fx)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)}{\sqrt{-c^2d\,x^2+d}}dx$$

```
[In] int((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

```
[Out] int((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

Fricas [F]

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(fx)^{\frac{3}{2}}\,(b\arcsin{(cx)}+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*f*x*arcsin(c*x) + a*f*x)*sqrt(f*x)/(c^2*d*x^2 - d), x)

Sympy [F]

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(fx)^{\frac{3}{2}}\,(a+b\operatorname{asin}{(cx)})}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

[In] integrate((f*x)**(3/2)*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)

[Out] Integral((f*x)**(3/2)*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)

Maxima [F]

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(fx)^{\frac{3}{2}}\,(b\arcsin{(cx)}+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")

[Out] integrate((f*x)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)

Giac [F]

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(fx)^{\frac{3}{2}}\,(b\arcsin{(cx)}+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

[In] integrate((f*x)^(3/2)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")

[Out] integrate((f*x)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{(fx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(f\,x\right)^{3/2}}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f*x)^(3/2))/(d - c^2*d*x^2)^(1/2),x)
[Out] int(((a + b*asin(c*x))*(f*x)^(3/2))/(d - c^2*d*x^2)^(1/2), x)
```

3.143 $\int x^m(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 315

$$\begin{aligned}
&\int x^m(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx\\
&=-\frac{bcd^3(2271+1329m+284m^2+27m^3+m^4)\,x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2(7+m)^2}\\
&\quad+\frac{bc^3d^3(9+m)(13+2m)x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2(7+m)^2}-\frac{bc^5d^3x^{6+m}\sqrt{1-c^2x^2}}{(7+m)^2}\\
&\quad+\frac{d^3x^{1+m}(a+b\arcsin(cx))}{1+m}-\frac{3c^2d^3x^{3+m}(a+b\arcsin(cx))}{3+m}\\
&\quad+\frac{3c^4d^3x^{5+m}(a+b\arcsin(cx))}{5+m}-\frac{c^6d^3x^{7+m}(a+b\arcsin(cx))}{7+m}\\
&\quad-\frac{3bcd^3(2161+1813m+455m^2+35m^3)\,x^{2+m}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(1+m)(2+m)(3+m)^2(5+m)^2(7+m)^2}
\end{aligned}$$

```
[Out] d^3*x^(1+m)*(a+b*arcsin(c*x))/(1+m)-3*c^2*d^3*x^(3+m)*(a+b*arcsin(c*x))/(3+
m)+3*c^4*d^3*x^(5+m)*(a+b*arcsin(c*x))/(5+m)-c^6*d^3*x^(7+m)*(a+b*arcsin(c*
x))/(7+m)-3*b*c*d^3*(35*m^3+455*m^2+1813*m+2161)*x^(2+m)*hypergeom([1/2, 1+
1/2*m],[2+1/2*m],c^2*x^2)/(m^2+3*m+2)/(m^3+15*m^2+71*m+105)^2-b*c*d^3*(m^4+
27*m^3+284*m^2+1329*m+2271)*x^(2+m)*(-c^2*x^2+1)^(1/2)/(7+m)^2/(m^2+8*m+15)
^2+b*c^3*d^3*(9+m)*(13+2*m)*x^(4+m)*(-c^2*x^2+1)^(1/2)/(5+m)^2/(7+m)^2-b*c^
5*d^3*x^(6+m)*(-c^2*x^2+1)^(1/2)/(7+m)^2
```

Rubi [A] (verified)

Time = 1.27 (sec) , antiderivative size = 315, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {276, 4777, 12, 1823, 1281, 470, 371}

$$\int x^m(d-c^2dx^2)^3(a+b\arcsin(cx))\,dx$$
$$= -\frac{c^6d^3x^{m+7}(a+b\arcsin(cx))}{m+7}+\frac{3c^4d^3x^{m+5}(a+b\arcsin(cx))}{m+5}$$
$$-\frac{3c^2d^3x^{m+3}(a+b\arcsin(cx))}{m+3}+\frac{d^3x^{m+1}(a+b\arcsin(cx))}{m+1}$$
$$-\frac{3bcd^3(35m^3+455m^2+1813m+2161)\,x^{m+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{(m+1)(m+2)(m+3)^2(m+5)^2(m+7)^2}$$
$$-\frac{bcd^3(m^4+27m^3+284m^2+1329m+2271)\sqrt{1-c^2x^2}x^{m+2}}{(m+3)^2(m+5)^2(m+7)^2}$$
$$-\frac{bc^5d^3\sqrt{1-c^2x^2}x^{m+6}}{(m+7)^2}+\frac{bc^3d^3(m+9)(2m+13)\sqrt{1-c^2x^2}x^{m+4}}{(m+5)^2(m+7)^2}$$

```
[In] Int[x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] -((b*c*d^3*(2271 + 1329*m + 284*m^2 + 27*m^3 + m^4)*x^(2 + m)*Sqrt[1 - c^2*
x^2])/((3 + m)^2*(5 + m)^2*(7 + m)^2)) + (b*c^3*d^3*(9 + m)*(13 + 2*m)*x^(4
 + m)*Sqrt[1 - c^2*x^2])/((5 + m)^2*(7 + m)^2) - (b*c^5*d^3*x^(6 + m)*Sqrt[
1 - c^2*x^2])/(7 + m)^2 + (d^3*x^(1 + m)*(a + b*ArcSin[c*x]))/(1 + m) - (3*
c^2*d^3*x^(3 + m)*(a + b*ArcSin[c*x]))/(3 + m) + (3*c^4*d^3*x^(5 + m)*(a +
b*ArcSin[c*x]))/(5 + m) - (c^6*d^3*x^(7 + m)*(a + b*ArcSin[c*x]))/(7 + m) -
 (3*b*c*d^3*(2161 + 1813*m + 455*m^2 + 35*m^3)*x^(2 + m)*Hypergeometric2F1[
1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/((1 + m)*(2 + m)*(3 + m)^2*(5 + m)^2*(
7 + m)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
```

```
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 1823

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\text{integral} = \frac{d^3x^{1+m}(a+b\arcsin(cx))}{1+m} - \frac{3c^2d^3x^{3+m}(a+b\arcsin(cx))}{3+m} + \frac{3c^4d^3x^{5+m}(a+b\arcsin(cx))}{5+m} - \frac{c^6d^3x^{7+m}(a+b\arcsin(cx))}{7+m} - (bc)\int \frac{d^3x^{1+m}\left(\frac{1}{1+m} - \frac{3c^2x^2}{3+m} + \frac{3c^4x^4}{5+m} - \frac{c^6x^6}{7+m}\right)}{\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{d^3x^{1+m}(a+b\arcsin(cx))}{1+m} - \frac{3c^2d^3x^{3+m}(a+b\arcsin(cx))}{3+m} + \frac{3c^4d^3x^{5+m}(a+b\arcsin(cx))}{5+m} - \frac{c^6d^3x^{7+m}(a+b\arcsin(cx))}{7+m} - \left(bcd^3\right)\int \frac{x^{1+m}\left(\frac{1}{1+m} - \frac{3c^2x^2}{3+m} + \frac{3c^4x^4}{5+m} - \frac{c^6x^6}{7+m}\right)}{\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{bc^5d^3x^{6+m}\sqrt{1-c^2x^2}}{(7+m)^2} + \frac{d^3x^{1+m}(a+b\arcsin(cx))}{1+m} - \frac{3c^2d^3x^{3+m}(a+b\arcsin(cx))}{3+m} + \frac{3c^4d^3x^{5+m}(a+b\arcsin(cx))}{5+m} - \frac{c^6d^3x^{7+m}(a+b\arcsin(cx))}{7+m} + \frac{\left(bd^3\right)\int \frac{x^{1+m}\left(-\frac{c^2(7+m)}{1+m} + \frac{3c^4(7+m)x^2}{3+m} - \frac{c^6(9+m)(13+2m)x^4}{(5+m)(7+m)}\right)}{\sqrt{1-c^2x^2}}\,dx}{c(7+m)}$$

$$= \frac{bc^3d^3(9+m)(13+2m)x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2(7+m)^2} - \frac{bc^5d^3x^{6+m}\sqrt{1-c^2x^2}}{(7+m)^2} + \frac{d^3x^{1+m}(a+b\arcsin(cx))}{1+m} - \frac{3c^2d^3x^{3+m}(a+b\arcsin(cx))}{3+m} + \frac{3c^4d^3x^{5+m}(a+b\arcsin(cx))}{5+m} - \frac{c^6d^3x^{7+m}(a+b\arcsin(cx))}{7+m} - \frac{\left(bd^3\right)\int \frac{x^{1+m}\left(\frac{c^4(5+m)(7+m)}{1+m} - \frac{c^6\left(2271+1329m+284m^2+27m^3+m^4\right)x^2}{(3+m)(5+m)(7+m)}\right)}{\sqrt{1-c^2x^2}}\,dx}{c^3(5+m)(7+m)}$$

$$= -\frac{bcd^3\left(2271+1329m+284m^2+27m^3+m^4\right)x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2(7+m)^2} + \frac{bc^3d^3(9+m)(13+2m)x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2(7+m)^2} - \frac{bc^5d^3x^{6+m}\sqrt{1-c^2x^2}}{(7+m)^2} + \frac{d^3x^{1+m}(a+b\arcsin(cx))}{1+m} - \frac{3c^2d^3x^{3+m}(a+b\arcsin(cx))}{3+m} + \frac{3c^4d^3x^{5+m}(a+b\arcsin(cx))}{5+m} - \frac{c^6d^3x^{7+m}(a+b\arcsin(cx))}{7+m} - \frac{\left(3bcd^3\left(2161+1813m+455m^2+35m^3\right)\right)\int \frac{x^{1+m}}{\sqrt{1-c^2x^2}}\,dx}{(1+m)(3+m)^2(5+m)^2(7+m)^2}$$

$$= -\frac{bcd^3(2271 + 1329m + 284m^2 + 27m^3 + m^4)\, x^{2+m}\sqrt{1 - c^2x^2}}{(3 + m)^2(5 + m)^2(7 + m)^2}$$
$$+ \frac{bc^3d^3(9 + m)(13 + 2m)x^{4+m}\sqrt{1 - c^2x^2}}{(5 + m)^2(7 + m)^2} - \frac{bc^5d^3x^{6+m}\sqrt{1 - c^2x^2}}{(7 + m)^2}$$
$$+ \frac{d^3x^{1+m}(a + b\arcsin(cx))}{1 + m} - \frac{3c^2d^3x^{3+m}(a + b\arcsin(cx))}{3 + m}$$
$$+ \frac{3c^4d^3x^{5+m}(a + b\arcsin(cx))}{5 + m} - \frac{c^6d^3x^{7+m}(a + b\arcsin(cx))}{7 + m}$$
$$- \frac{3bcd^3(2161 + 1813m + 455m^2 + 35m^3)\, x^{2+m}\, \text{Hypergeometric2F1}\left(\frac{1}{2}, \frac{2+m}{2}, \frac{4+m}{2}, c^2x^2\right)}{(1 + m)(2 + m)(3 + m)^2(5 + m)^2(7 + m)^2}$$

Mathematica [A] (verified)

Time = 0.32 (sec) , antiderivative size = 256, normalized size of antiderivative = 0.81

$$\int x^m \left(d - c^2dx^2\right)^3 (a + b\arcsin(cx))\, dx$$
$$= \frac{x^{1+m}\left(\left(d - c^2dx^2\right)^3 (a + b\arcsin(cx)) - \frac{bcd^3x\, \text{Hypergeometric2F1}\left(-\frac{5}{2}, 1+\frac{m}{2}, 2+\frac{m}{2}, c^2x^2\right)}{2+m} + \frac{6d\left(\left(d-c^2dx^2\right)^2(a+b\arcsin(cx)) - \cdots\right.}{\cdots}\right.}{\cdots}$$

```
[In] Integrate[x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (x^(1 + m)*((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x]) - (b*c*d^3*x*Hypergeometr
ic2F1[-5/2, 1 + m/2, 2 + m/2, c^2*x^2])/(2 + m) + (6*d*((d - c^2*d*x^2)^2*(
a + b*ArcSin[c*x]) - (b*c*d^2*x*Hypergeometric2F1[-3/2, 1 + m/2, 2 + m/2, c
^2*x^2])/(2 + m) - (4*d^2*((2 + m)*(-3 + c^2*x^2 + m*(-1 + c^2*x^2))*(a + b
*ArcSin[c*x]) + b*c*(1 + m)*x*Hypergeometric2F1[-1/2, 1 + m/2, 2 + m/2, c^2
*x^2] + 2*b*c*x*Hypergeometric2F1[1/2, 1 + m/2, 2 + m/2, c^2*x^2]))/((1 + m
)*(2 + m)*(3 + m))))/(5 + m)))/(7 + m)
```

Maple [F]

$$\int x^m \left(-c^2d\, x^2 + d\right)^3 (a + b\arcsin(cx))\, dx$$

```
[In] int(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$\int x^m \left(d-c^2dx^2\right)^3 (a+b\arcsin(cx))\,dx = \int -\left(c^2dx^2-d\right)^3(b\arcsin(cx)+a)x^m\,dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(a*c^6*d^3*x^6 - 3*a*c^4*d^3*x^4 + 3*a*c^2*d^3*x^2 - a*d^3 + (b*c
^6*d^3*x^6 - 3*b*c^4*d^3*x^4 + 3*b*c^2*d^3*x^2 - b*d^3)*arcsin(c*x))*x^m, x
)
```

Sympy [F]

$$\int x^m \left(d-c^2dx^2\right)^3 (a+b\arcsin(cx))\,dx = -d^3\left(\int (-ax^m)\,dx + \int (-bx^m\operatorname{asin}(cx))\,dx + \int 3ac^2x^2x^m\,dx + \int \left(-3ac^4x^4x^m\right)\,dx + \int ac^6x^6x^m\,dx + \int 3bc^2x^2x^m\operatorname{asin}(cx)\,dx + \int \left(-3bc^4x^4x^m\operatorname{asin}(cx)\right)\,dx + \int bc^6x^6x^m\operatorname{asin}(cx)\,dx\right)$$

```
[In] integrate(x**m*(-c**2*d*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] -d**3*(Integral(-a*x**m, x) + Integral(-b*x**m*asin(c*x), x) + Integral(3*a
*c**2*x**2*x**m, x) + Integral(-3*a*c**4*x**4*x**m, x) + Integral(a*c**6*x*
*6*x**m, x) + Integral(3*b*c**2*x**2*x**m*asin(c*x), x) + Integral(-3*b*c**
4*x**4*x**m*asin(c*x), x) + Integral(b*c**6*x**6*x**m*asin(c*x), x))
```

Maxima [F]

$$\int x^m \left(d-c^2dx^2\right)^3 (a+b\arcsin(cx))\,dx = \int -\left(c^2dx^2-d\right)^3(b\arcsin(cx)+a)x^m\,dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] -a*c^6*d^3*x^(m + 7)/(m + 7) + 3*a*c^4*d^3*x^(m + 5)/(m + 5) - 3*a*c^2*d^3*
x^(m + 3)/(m + 3) + a*d^3*x^(m + 1)/(m + 1) - (((b*c^6*d^3*m^3 + 9*b*c^6*d^
3*m^2 + 23*b*c^6*d^3*m + 15*b*c^6*d^3)*x^7 - 3*(b*c^4*d^3*m^3 + 11*b*c^4*d^
3*m^2 + 31*b*c^4*d^3*m + 21*b*c^4*d^3)*x^5 + 3*(b*c^2*d^3*m^3 + 13*b*c^2*d^
```

```
3*m^2 + 47*b*c^2*d^3*m + 35*b*c^2*d^3)*x^3 - (b*d^3*m^3 + 15*b*d^3*m^2 + 71
*b*d^3*m + 105*b*d^3)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (
m^4 + 16*m^3 + 86*m^2 + 176*m + 105)*integrate(-((b*c^7*d^3*m^3 + 9*b*c^7*d
^3*m^2 + 23*b*c^7*d^3*m + 15*b*c^7*d^3)*x^7 - 3*(b*c^5*d^3*m^3 + 11*b*c^5*d
^3*m^2 + 31*b*c^5*d^3*m + 21*b*c^5*d^3)*x^5 + 3*(b*c^3*d^3*m^3 + 13*b*c^3*d
^3*m^2 + 47*b*c^3*d^3*m + 35*b*c^3*d^3)*x^3 - (b*c*d^3*m^3 + 15*b*c*d^3*m^2
 + 71*b*c*d^3*m + 105*b*c*d^3)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x^m/(m^4 + 1
6*m^3 - (c^2*m^4 + 16*c^2*m^3 + 86*c^2*m^2 + 176*c^2*m + 105*c^2)*x^2 + 86*
m^2 + 176*m + 105), x))/(m^4 + 16*m^3 + 86*m^2 + 176*m + 105)
```

Giac [F]

$$\int x^m (d-c^2dx^2)^3 (a+b\arcsin(cx))\,dx = \int -(c^2dx^2-d)^3(b\arcsin(cx)+a)x^m\,dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)*x^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^m (d-c^2dx^2)^3 (a+b\arcsin(cx))\,dx = \int x^m\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^3\,dx$$

```
[In] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^3,x)
[Out] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^3, x)
```

3.144 $\int x^m(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 25, antiderivative size = 217

$$\begin{aligned}\int x^m(d-c^2dx^2)^2(a+b\arcsin(cx))\,dx &= -\frac{bcd^2(38+13m+m^2)\,x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2}+\frac{bc^3d^2x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2}\\ &\quad+\frac{d^2x^{1+m}(a+b\arcsin(cx))}{1+m}-\frac{2c^2d^2x^{3+m}(a+b\arcsin(cx))}{3+m}+\frac{c^4d^2x^{5+m}(a+b\arcsin(cx))}{5+m}\\ &\quad-\frac{bcd^2(149+100m+15m^2)\,x^{2+m}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(1+m)(2+m)(3+m)^2(5+m)^2}\end{aligned}$$

```
[Out] d^2*x^(1+m)*(a+b*arcsin(c*x))/(1+m)-2*c^2*d^2*x^(3+m)*(a+b*arcsin(c*x))/(3+
m)+c^4*d^2*x^(5+m)*(a+b*arcsin(c*x))/(5+m)-b*c*d^2*(15*m^2+100*m+149)*x^(2+
m)*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(m^2+3*m+2)/(m^2+8*m+15)^2-b
*c*d^2*(m^2+13*m+38)*x^(2+m)*(-c^2*x^2+1)^(1/2)/(3+m)^2/(5+m)^2+b*c^3*d^2*x
^(4+m)*(-c^2*x^2+1)^(1/2)/(5+m)^2
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used

$= \{276, 4777, 12, 1281, 470, 371\}$

$$\int x^m \left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))\,dx$$
$$= \frac{c^4d^2x^{m+5}(a+b\arcsin(cx))}{m+5} - \frac{2c^2d^2x^{m+3}(a+b\arcsin(cx))}{m+3} + \frac{d^2x^{m+1}(a+b\arcsin(cx))}{m+1} - \frac{bcd^2(15m^2+100m+149)\,x^{m+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{(m+1)(m+2)(m+3)^2(m+5)^2} - \frac{bcd^2(m^2+13m+38)\sqrt{1-c^2x^2}x^{m+2}}{(m+3)^2(m+5)^2} + \frac{bc^3d^2\sqrt{1-c^2x^2}x^{m+4}}{(m+5)^2}$$

```
[In] Int[x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] -((b*c*d^2*(38 + 13*m + m^2)*x^(2 + m)*Sqrt[1 - c^2*x^2])/((3 + m)^2*(5 + m
)^2)) + (b*c^3*d^2*x^(4 + m)*Sqrt[1 - c^2*x^2])/(5 + m)^2 + (d^2*x^(1 + m)*
(a + b*ArcSin[c*x]))/(1 + m) - (2*c^2*d^2*x^(3 + m)*(a + b*ArcSin[c*x]))/(3
 + m) + (c^4*d^2*x^(5 + m)*(a + b*ArcSin[c*x]))/(5 + m) - (b*c*d^2*(149 + 1
00*m + 15*m^2)*x^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x
^2])/((1 + m)*(2 + m)*(3 + m)^2*(5 + m)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{d^2x^{1+m}(a+b\arcsin(cx))}{1+m} - \frac{2c^2d^2x^{3+m}(a+b\arcsin(cx))}{3+m} \\
&\quad + \frac{c^4d^2x^{5+m}(a+b\arcsin(cx))}{5+m} - (bc)\int \frac{d^2x^{1+m}\left(\frac{1}{1+m}-\frac{2c^2x^2}{3+m}+\frac{c^4x^4}{5+m}\right)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{d^2x^{1+m}(a+b\arcsin(cx))}{1+m} - \frac{2c^2d^2x^{3+m}(a+b\arcsin(cx))}{3+m} \\
&\quad + \frac{c^4d^2x^{5+m}(a+b\arcsin(cx))}{5+m} - (bcd^2)\int \frac{x^{1+m}\left(\frac{1}{1+m}-\frac{2c^2x^2}{3+m}+\frac{c^4x^4}{5+m}\right)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{bc^3d^2x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2} + \frac{d^2x^{1+m}(a+b\arcsin(cx))}{1+m} - \frac{2c^2d^2x^{3+m}(a+b\arcsin(cx))}{3+m} \\
&\quad + \frac{c^4d^2x^{5+m}(a+b\arcsin(cx))}{5+m} + \frac{(bd^2)\int \frac{x^{1+m}\left(-\frac{c^2(5+m)}{1+m}+\frac{c^4(38+13m+m^2)x^2}{(3+m)(5+m)}\right)}{\sqrt{1-c^2x^2}}\,dx}{c(5+m)} \\
&= -\frac{bcd^2(38+13m+m^2)\,x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2} + \frac{bc^3d^2x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2} \\
&\quad + \frac{d^2x^{1+m}(a+b\arcsin(cx))}{1+m} - \frac{2c^2d^2x^{3+m}(a+b\arcsin(cx))}{3+m} \\
&\quad + \frac{c^4d^2x^{5+m}(a+b\arcsin(cx))}{5+m} - \frac{(bcd^2(149+100m+15m^2))\int \frac{x^{1+m}}{\sqrt{1-c^2x^2}}\,dx}{(1+m)(3+m)^2(5+m)^2}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{bcd^2(38+13m+m^2)\,x^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2(5+m)^2} \\
&\quad + \frac{bc^3d^2x^{4+m}\sqrt{1-c^2x^2}}{(5+m)^2} + \frac{d^2x^{1+m}(a+b\arcsin(cx))}{1+m} \\
&\quad - \frac{2c^2d^2x^{3+m}(a+b\arcsin(cx))}{3+m} + \frac{c^4d^2x^{5+m}(a+b\arcsin(cx))}{5+m} \\
&\quad - \frac{bcd^2(149+100m+15m^2)\,x^{2+m}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(1+m)(2+m)(3+m)^2(5+m)^2}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 187, normalized size of antiderivative = 0.86

$$
\int x^m\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))\,dx = \frac{x^{1+m}\left(\left(d-c^2dx^2\right)^2(a+b\arcsin(cx)) - \frac{bcd^2x\,\text{Hypergeometric2F1}\left(-\frac{3}{2},1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)}{2+m} - \frac{4d^2\left((2+m)\left(-3+c^2x^2+m\left(-1+c^2x^2\right)\right.\right.}{}\right.}{5+m}
$$

```
[In] Integrate[x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (x^(1 + m)*((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x]) - (b*c*d^2*x*Hypergeometr
ic2F1[-3/2, 1 + m/2, 2 + m/2, c^2*x^2])/(2 + m) - (4*d^2*((2 + m)*(-3 + c^2
*x^2 + m*(-1 + c^2*x^2))*(a + b*ArcSin[c*x]) + b*c*(1 + m)*x*Hypergeometric
2F1[-1/2, 1 + m/2, 2 + m/2, c^2*x^2] + 2*b*c*x*Hypergeometric2F1[1/2, 1 + m
/2, 2 + m/2, c^2*x^2]))/((1 + m)*(2 + m)*(3 + m))))/(5 + m)
```

Maple [F]

$$
\int x^m\left(-c^2d\,x^2+d\right)^2(a+b\arcsin(cx))\,dx
$$

```
[In] int(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$
\int x^m\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))\,dx = \int \left(c^2dx^2-d\right)^2(b\arcsin(cx)+a)x^m\,dx
$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^
2*d^2*x^2 + b*d^2)*arcsin(c*x))*x^m, x)
```

Sympy [F]

$$\int x^m \left(d - c^2dx^2\right)^2 (a + b\arcsin(cx))\,dx = d^2\left(\int ax^m\,dx + \int bx^m \operatorname{asin}(cx)\,dx + \int \left(-2ac^2x^2x^m\right)\,dx + \int ac^4x^4x^m\,dx + \int \left(-2bc^2x^2x^m \operatorname{asin}(cx)\right)\,dx + \int bc^4x^4x^m \operatorname{asin}(cx)\,dx\right)$$

```
[In] integrate(x**m*(-c**2*d*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] d**2*(Integral(a*x**m, x) + Integral(b*x**m*asin(c*x), x) + Integral(-2*a*c
**2*x**2*x**m, x) + Integral(a*c**4*x**4*x**m, x) + Integral(-2*b*c**2*x**2
*x**m*asin(c*x), x) + Integral(b*c**4*x**4*x**m*asin(c*x), x))
```

Maxima [F]

$$\int x^m \left(d - c^2dx^2\right)^2 (a + b\arcsin(cx))\,dx = \int \left(c^2dx^2 - d\right)^2 (b\arcsin(cx) + a)x^m\,dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] a*c^4*d^2*x^(m + 5)/(m + 5) - 2*a*c^2*d^2*x^(m + 3)/(m + 3) + a*d^2*x^(m +
1)/(m + 1) + (((b*c^4*d^2*m^2 + 4*b*c^4*d^2*m + 3*b*c^4*d^2)*x^5 - 2*(b*c^2
*d^2*m^2 + 6*b*c^2*d^2*m + 5*b*c^2*d^2)*x^3 + (b*d^2*m^2 + 8*b*d^2*m + 15*b
*d^2)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (m^3 + 9*m^2 + 23
*m + 15)*integrate(-((b*c^5*d^2*m^2 + 4*b*c^5*d^2*m + 3*b*c^5*d^2)*x^5 - 2*
(b*c^3*d^2*m^2 + 6*b*c^3*d^2*m + 5*b*c^3*d^2)*x^3 + (b*c*d^2*m^2 + 8*b*c*d^
2*m + 15*b*c*d^2)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x^m/(m^3 - (c^2*m^3 + 9*c
^2*m^2 + 23*c^2*m + 15*c^2)*x^2 + 9*m^2 + 23*m + 15), x))/(m^3 + 9*m^2 + 23
*m + 15)
```

Giac [F]

$$\int x^m \left(d - c^2dx^2\right)^2 (a + b\arcsin(cx))\,dx = \int \left(c^2dx^2 - d\right)^2 (b\arcsin(cx) + a)x^m\,dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)*x^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^m \left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))\,dx=\int x^m\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^2\,dx$$

```
[In] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^2,x)
[Out] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^2, x)
```

3.145 $\int x^m(d-c^2dx^2)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 129

$$\int x^m\left(d-c^2dx^2\right)(a+b\arcsin(cx))\,dx = -\frac{bcdx^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2}+\frac{dx^{1+m}(a+b\arcsin(cx))}{1+m}-\frac{c^2dx^{3+m}(a+b\arcsin(cx))}{3+m} - \frac{bcd(7+3m)x^{2+m}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(1+m)(2+m)(3+m)^2}$$

```
[Out] d*x^(1+m)*(a+b*arcsin(c*x))/(1+m)-c^2*d*x^(3+m)*(a+b*arcsin(c*x))/(3+m)-b*c
*d*(7+3*m)*x^(2+m)*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(3+m)^2/(m^2
+3*m+2)-b*c*d*x^(2+m)*(-c^2*x^2+1)^(1/2)/(3+m)^2
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {14, 4777, 12, 470, 371}

$$\int x^m\left(d-c^2dx^2\right)(a+b\arcsin(cx))\,dx = -\frac{c^2dx^{m+3}(a+b\arcsin(cx))}{m+3}+\frac{dx^{m+1}(a+b\arcsin(cx))}{m+1} - \frac{bcd(3m+7)x^{m+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{(m+1)(m+2)(m+3)^2}-\frac{bcd\sqrt{1-c^2x^2}x^{m+2}}{(m+3)^2}$$

```
[In] Int[x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -((b*c*d*x^(2 + m)*Sqrt[1 - c^2*x^2])/(3 + m)^2) + (d*x^(1 + m)*(a + b*ArcS
in[c*x]))/(1 + m) - (c^2*d*x^(3 + m)*(a + b*ArcSin[c*x]))/(3 + m) - (b*c*d*
(7 + 3*m)*x^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/
((1 + m)*(2 + m)*(3 + m)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{dx^{1+m}(a+b\arcsin(cx))}{1+m}-\frac{c^2dx^{3+m}(a+b\arcsin(cx))}{3+m}\\&\quad-(bc)\int\frac{dx^{1+m}\left(\frac{1}{1+m}-\frac{c^2x^2}{3+m}\right)}{\sqrt{1-c^2x^2}}\,dx\end{aligned}$$

$$= \frac{dx^{1+m}(a+b\arcsin(cx))}{1+m} - \frac{c^2dx^{3+m}(a+b\arcsin(cx))}{3+m} - (bcd)\int \frac{x^{1+m}\left(\frac{1}{1+m}-\frac{c^2x^2}{3+m}\right)}{\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{bcdx^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2} + \frac{dx^{1+m}(a+b\arcsin(cx))}{1+m} - \frac{c^2dx^{3+m}(a+b\arcsin(cx))}{3+m} - \frac{(bcd(7+3m))\int \frac{x^{1+m}}{\sqrt{1-c^2x^2}}\,dx}{(1+m)(3+m)^2}$$

$$= -\frac{bcdx^{2+m}\sqrt{1-c^2x^2}}{(3+m)^2} + \frac{dx^{1+m}(a+b\arcsin(cx))}{1+m} - \frac{c^2dx^{3+m}(a+b\arcsin(cx))}{3+m} - \frac{bcd(7+3m)x^{2+m}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(1+m)(2+m)(3+m)^2}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.91

$$\int x^m\left(d-c^2dx^2\right)(a+b\arcsin(cx))\,dx = -\frac{dx^{1+m}\left((2+m)\left(-3+c^2x^2+m(-1+c^2x^2)\right)(a+b\arcsin(cx))+bc(1+m)x\,\text{Hypergeometric2F1}\left(-\frac{1}{2}\right.\right.}{(1+m)(2+m)(3+m)}$$

```
[In] Integrate[x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -((d*x^(1 + m)*((2 + m)*(-3 + c^2*x^2 + m*(-1 + c^2*x^2))*(a + b*ArcSin[c*x
]) + b*c*(1 + m)*x*Hypergeometric2F1[-1/2, 1 + m/2, 2 + m/2, c^2*x^2] + 2*b
*c*x*Hypergeometric2F1[1/2, 1 + m/2, 2 + m/2, c^2*x^2]))/((1 + m)*(2 + m)*(
3 + m)))
```

Maple [F]

$$\int x^m\left(-c^2d\,x^2+d\right)(a+b\arcsin(cx))\,dx$$

```
[In] int(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$\int x^m (d - c^2dx^2) (a + b \arcsin(cx)) \, dx = \int -(c^2dx^2 - d)(b \arcsin(cx) + a)x^m \, dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*x^m, x)
```

Sympy [F]

$$\int x^m (d - c^2dx^2) (a + b \arcsin(cx)) \, dx = -d\left(\int (-ax^m) \, dx + \int (-bx^m \operatorname{asin}(cx)) \, dx + \int ac^2x^2x^m \, dx + \int bc^2x^2x^m \operatorname{asin}(cx) \, dx\right)$$

```
[In] integrate(x**m*(-c**2*d*x**2+d)*(a+b*asin(c*x)),x)
[Out] -d*(Integral(-a*x**m, x) + Integral(-b*x**m*asin(c*x), x) + Integral(a*c**2
*x**2*x**m, x) + Integral(b*c**2*x**2*x**m*asin(c*x), x))
```

Maxima [F]

$$\int x^m (d - c^2dx^2) (a + b \arcsin(cx)) \, dx = \int -(c^2dx^2 - d)(b \arcsin(cx) + a)x^m \, dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] -a*c^2*d*x^(m + 3)/(m + 3) + a*d*x^(m + 1)/(m + 1) - (((b*c^2*d*m + b*c^2*d
)*x^3 - (b*d*m + 3*b*d)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) +
 (m^2 + 4*m + 3)*integrate(((b*c^3*d*m + b*c^3*d)*x^3 - (b*c*d*m + 3*b*c*d)
*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x^m/((c^2*m^2 + 4*c^2*m + 3*c^2)*x^2 - m^2
 - 4*m - 3), x))/(m^2 + 4*m + 3)
```

Giac [F]

$$\int x^m (d - c^2dx^2) (a + b\arcsin(cx))\, dx = \int -(c^2dx^2 - d)(b\arcsin(cx) + a)x^m\, dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)*x^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^m (d - c^2dx^2) (a + b\arcsin(cx))\, dx = \int x^m\, (a + b\,\mathrm{asin}(c\,x))\, \left(d - c^2\,d\,x^2\right)\, dx$$

```
[In] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2),x)
[Out] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2), x)
```

3.146 $\int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \text{Int}\left(\frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2},x\right)$$

```
[Out] Unintegrable(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x)
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx$$

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
```

```
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 3.89 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx=\int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx$$

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2),x]
[Out] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.41 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{x^m(a+b\arcsin(cx))}{-c^2d\,x^2+d}dx$$

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x)
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.16

$$\int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx=\int -\frac{(b\arcsin(cx)+a)x^m}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="fricas")
[Out] integral(-(b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d), x)
```

Sympy [N/A]

Not integrable

Time = 2.74 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.48

$$\int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx=-\frac{\int \frac{ax^m}{c^2x^2-1}\,dx+\int \frac{bx^m\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d),x)
[Out] -(Integral(a*x**m/(c**2*x**2 - 1), x) + Integral(b*x**m*asin(c*x)/(c**2*x**
2 - 1), x))/d
```

Maxima [N/A]

Not integrable

Time = 0.57 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.20

$$\int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)x^m}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="maxima")
[Out] -integrate((b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d), x)
```

Giac [N/A]

Not integrable

Time = 0.59 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.16

$$\int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)x^m}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d), x)
```

Mupad [N/A]

Not integrable

Time = 0.33 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx = \int \frac{x^m\,(a+b\,\mathrm{asin}(c\,x))}{d-c^2\,d\,x^2}\,dx$$

```
[In] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2),x)
[Out] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2), x)
```

3.147 $\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \frac{x^{1+m}(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} - \frac{bcx^{2+m}\,\text{Hypergeometric2F1}\left(\frac{3}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{2d^2(2+m)} + \frac{(1-m)\text{Int}\left(\frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2},x\right)}{2d}$$

```
[Out] 1/2*x^(1+m)*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)-1/2*b*c*x^(2+m)*hypergeom([3
/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/d^2/(2+m)+1/2*(1-m)*Unintegrable(x^m*(a+b*a
rcsin(c*x))/(-c^2*d*x^2+d),x)/d
```

Rubi [N/A]

Not integrable

Time = 0.10 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx$$

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
```

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(2*d^2*(1 - c^2*x^2)) - (b*c*x^(2 + m)*Hype
rgeometric2F1[3/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(2*d^2*(2 + m)) + ((1 -
m)*Defer[Int][(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2), x])/(2*d)
```

Rubi steps

$$\text{integral} = \frac{x^{1+m}(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} - \frac{(bc)\int \frac{x^{1+m}}{(1-c^2x^2)^{3/2}}\,dx}{2d^2} + \frac{(1-m)\int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx}{2d}$$
$$= \frac{x^{1+m}(a+b\arcsin(cx))}{2d^2(1-c^2x^2)} - \frac{bcx^{2+m}\,\text{Hypergeometric2F1}\left(\frac{3}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{2d^2(2+m)} + \frac{(1-m)\int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx}{2d}$$

Mathematica [N/A]

Not integrable

Time = 5.78 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx$$

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2,x]
[Out] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.40 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{x^m(a+b\arcsin(cx))}{(-c^2d\,x^2+d)^2}dx$$

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x)
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.64

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^m}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)*x^m/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [N/A]

Not integrable

Time = 16.34 (sec) , antiderivative size = 54, normalized size of antiderivative = 2.16

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \frac{\int \frac{ax^m}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{bx^m\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**2,x)
[Out] (Integral(a*x**m/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b*x**m*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Maxima [N/A]

Not integrable

Time = 0.56 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.12

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^m}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
[Out] integrate((b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d)^2, x)
```

Giac [N/A]

Not integrable

Time = 0.61 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.12

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^m}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d)^2, x)
```

Mupad [N/A]

Not integrable

Time = 0.33 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx=\int \frac{x^m\,(a+b\,\mathrm{asin}(c\,x))}{{(d-c^2\,d\,x^2)}^2}\,dx$$

```
[In] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2,x)
[Out] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^2, x)
```

3.148 $\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \frac{x^{1+m}(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2}+\frac{(3-m)x^{1+m}(a+b\arcsin(cx))}{8d^3(1-c^2x^2)} - \frac{bc(3-m)x^{2+m}\,\text{Hypergeometric2F1}\left(\frac{3}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{8d^3(2+m)} - \frac{bcx^{2+m}\,\text{Hypergeometric2F1}\left(\frac{5}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{4d^3(2+m)} + \frac{(1-m)(3-m)\text{Int}\left(\frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2},x\right)}{8d^2}$$

```
[Out] 1/4*x^(1+m)*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^2+1/8*(3-m)*x^(1+m)*(a+b*arc
sin(c*x))/d^3/(-c^2*x^2+1)-1/8*b*c*(3-m)*x^(2+m)*hypergeom([3/2, 1+1/2*m],[
2+1/2*m],c^2*x^2)/d^3/(2+m)-1/4*b*c*x^(2+m)*hypergeom([5/2, 1+1/2*m],[2+1/2
*m],c^2*x^2)/d^3/(2+m)+1/8*(1-m)*(3-m)*Unintegrable(x^m*(a+b*arcsin(c*x))/(
-c^2*d*x^2+d),x)/d^2
```

Rubi [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx$$

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
```

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(4*d^3*(1 - c^2*x^2)^2) + ((3 - m)*x^(1 + m
)*(a + b*ArcSin[c*x]))/(8*d^3*(1 - c^2*x^2)) - (b*c*(3 - m)*x^(2 + m)*Hyper
geometric2F1[3/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(8*d^3*(2 + m)) - (b*c*x^
(2 + m)*Hypergeometric2F1[5/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(4*d^3*(2 +
m)) + ((1 - m)*(3 - m)*Defer[Int][(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)
, x])/(8*d^2)
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^{1+m}(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} - \frac{(bc)\int \frac{x^{1+m}}{(1-c^2x^2)^{5/2}}\,dx}{4d^3} + \frac{(3-m)\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^2}\,dx}{4d} \\
&= \frac{x^{1+m}(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} + \frac{(3-m)x^{1+m}(a+b\arcsin(cx))}{8d^3(1-c^2x^2)} \\
&\quad - \frac{bcx^{2+m}\,\text{Hypergeometric2F1}\left(\frac{5}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{4d^3(2+m)} \\
&\quad - \frac{(bc(3-m))\int \frac{x^{1+m}}{(1-c^2x^2)^{3/2}}\,dx}{8d^3} + \frac{((1-m)(3-m))\int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx}{8d^2} \\
&= \frac{x^{1+m}(a+b\arcsin(cx))}{4d^3(1-c^2x^2)^2} + \frac{(3-m)x^{1+m}(a+b\arcsin(cx))}{8d^3(1-c^2x^2)} \\
&\quad - \frac{bc(3-m)x^{2+m}\,\text{Hypergeometric2F1}\left(\frac{3}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{8d^3(2+m)} \\
&\quad - \frac{bcx^{2+m}\,\text{Hypergeometric2F1}\left(\frac{5}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{4d^3(2+m)} \\
&\quad + \frac{((1-m)(3-m))\int \frac{x^m(a+b\arcsin(cx))}{d-c^2dx^2}\,dx}{8d^2}
\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 6.48 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx$$

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3,x]
[Out] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^3, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.31 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{x^{m} (a+b \arcsin \left(c x \right))}{\left(-c^{2} d \,x^{2}+d \right)^{3}}d x$$

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 55, normalized size of antiderivative = 2.20

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^3} \, dx=\int -\frac{(b \arcsin \left(c x\right) + a)x^{m}}{{\left(c^{2} d x^{2} - d\right)}^{3}} \,d x$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*arcsin(c*x) + a)*x^m/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*
x^2 - d^3), x)
```

Sympy [N/A]

Not integrable

Time = 117.00 (sec) , antiderivative size = 73, normalized size of antiderivative = 2.92

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^3} \, dx=- \frac{\int \frac{a x^{m}}{c^{6} x^{6} - 3 c^{4} x^{4} + 3 c^{2} x^{2} - 1}\, dx + \int \frac{b x^{m} \operatorname{asin}{\left(c x \right)}}{c^{6} x^{6} - 3 c^{4} x^{4} + 3 c^{2} x^{2} - 1}\, dx}{d^{3}}$$

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a*x**m/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integra
l(b*x**m*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d**3
```

Maxima [N/A]

Not integrable

Time = 0.58 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.20

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin{(cx)}+a)x^m}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
[Out] -integrate((b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d)^3, x)
```

Giac [N/A]

Not integrable

Time = 0.63 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.16

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin{(cx)}+a)x^m}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^3,x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d)^3, x)
```

Mupad [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^3}\,dx = \int \frac{x^m\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^3}\,dx$$

```
[In] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3,x)
[Out] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^3, x)
```

3.149 $\int x^m(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 635

$$\begin{aligned}
&\int x^m(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx = -\frac{15bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2(4+m)(6+m)\sqrt{1-c^2x^2}}\\
&-\frac{5bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{(6+m)(8+6m+m^2)\sqrt{1-c^2x^2}}-\frac{bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{(12+8m+m^2)\sqrt{1-c^2x^2}}\\
&+\frac{5bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}}{(4+m)^2(6+m)\sqrt{1-c^2x^2}}+\frac{2bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}}{(4+m)(6+m)\sqrt{1-c^2x^2}}\\
&-\frac{bc^5d^2x^{6+m}\sqrt{d-c^2dx^2}}{(6+m)^2\sqrt{1-c^2x^2}}+\frac{15d^2x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(6+m)(8+6m+m^2)}\\
&+\frac{5dx^{1+m}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{(4+m)(6+m)}+\frac{x^{1+m}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{6+m}\\
&+\frac{15d^2x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)}{(6+m)(8+14m+7m^2+m^3)\sqrt{1-c^2x^2}}\\
&-\frac{15bcd^2x^{2+m}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};c^2x^2\right)}{(1+m)(2+m)^2(4+m)(6+m)\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] 5*d*x^(1+m)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(4+m)/(6+m)+x^(1+m)*(-c^
2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/(6+m)+15*d^2*x^(1+m)*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/(6+m)/(m^2+6*m+8)-15*b*c*d^2*x^(2+m)*(-c^2*d*x^2+d)^(1/
2)/(2+m)^2/(4+m)/(6+m)/(-c^2*x^2+1)^(1/2)-5*b*c*d^2*x^(2+m)*(-c^2*d*x^2+d)^
(1/2)/(6+m)/(m^2+6*m+8)/(-c^2*x^2+1)^(1/2)-b*c*d^2*x^(2+m)*(-c^2*d*x^2+d)^(
1/2)/(m^2+8*m+12)/(-c^2*x^2+1)^(1/2)+5*b*c^3*d^2*x^(4+m)*(-c^2*d*x^2+d)^(1/
2)/(4+m)^2/(6+m)/(-c^2*x^2+1)^(1/2)+2*b*c^3*d^2*x^(4+m)*(-c^2*d*x^2+d)^(1/2
)/(4+m)/(6+m)/(-c^2*x^2+1)^(1/2)-b*c^5*d^2*x^(6+m)*(-c^2*d*x^2+d)^(1/2)/(6+
m)^2/(-c^2*x^2+1)^(1/2)+15*d^2*x^(1+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1/
```

```
2+1/2*m],[3/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(6+m)/(m^3+7*m^2+14*m+8)
/(-c^2*x^2+1)^(1/2)-15*b*c*d^2*x^(2+m)*hypergeom([1, 1+1/2*m, 1+1/2*m],[2+1
/2*m, 3/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(2+m)^2/(6+m)/(m^2+5*m+4)/(-
c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 635, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {4787, 4783, 4805, 30, 14, 276}

$$\int x^m \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = -\frac{15bcd^2x^{m+2}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{(m+1)(m+2)^2(m+4)(m+6)\sqrt{1-c^2x^2}} + \frac{15d^2x^{m+1}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},c^2x^2\right)(a+b\arcsin(cx))}{(m+6)\left(m^3+7m^2+14m+8\right)\sqrt{1-c^2x^2}} + \frac{15d^2x^{m+1}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(m+6)\left(m^2+6m+8\right)} + \frac{x^{m+1}\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{m+6} + \frac{5dx^{m+1}\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{(m+4)(m+6)} - \frac{5bcd^2x^{m+2}\sqrt{d-c^2dx^2}}{(m+6)\left(m^2+6m+8\right)\sqrt{1-c^2x^2}} - \frac{bcd^2x^{m+2}\sqrt{d-c^2dx^2}}{\left(m^2+8m+12\right)\sqrt{1-c^2x^2}} - \frac{15bcd^2x^{m+2}\sqrt{d-c^2dx^2}}{(m+2)^2(m+4)(m+6)\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^{m+6}\sqrt{d-c^2dx^2}}{(m+6)^2\sqrt{1-c^2x^2}} + \frac{2bc^3d^2x^{m+4}\sqrt{d-c^2dx^2}}{(m+4)(m+6)\sqrt{1-c^2x^2}} + \frac{5bc^3d^2x^{m+4}\sqrt{d-c^2dx^2}}{(m+4)^2(m+6)\sqrt{1-c^2x^2}}$$

```
[In] Int[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-15*b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((2 + m)^2*(4 + m)*(6 + m)*Sqrt
[1 - c^2*x^2]) - (5*b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((6 + m)*(8 + 6*
m + m^2)*Sqrt[1 - c^2*x^2]) - (b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((12
+ 8*m + m^2)*Sqrt[1 - c^2*x^2]) + (5*b*c^3*d^2*x^(4 + m)*Sqrt[d - c^2*d*x^2
])/((4 + m)^2*(6 + m)*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d^2*x^(4 + m)*Sqrt[d -
c^2*d*x^2])/((4 + m)*(6 + m)*Sqrt[1 - c^2*x^2]) - (b*c^5*d^2*x^(6 + m)*Sqrt
[d - c^2*d*x^2])/((6 + m)^2*Sqrt[1 - c^2*x^2]) + (15*d^2*x^(1 + m)*Sqrt[d -
 c^2*d*x^2]*(a + b*ArcSin[c*x]))/((6 + m)*(8 + 6*m + m^2)) + (5*d*x^(1 + m)
*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/((4 + m)*(6 + m)) + (x^(1 + m)*
(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(6 + m) + (15*d^2*x^(1 + m)*Sqrt
[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 +
m)/2, c^2*x^2])/((6 + m)*(8 + 14*m + 7*m^2 + m^3)*Sqrt[1 - c^2*x^2]) - (15*
```

```
b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/
2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/((1 + m)*(2 + m)^2*(4 + m)*(6 + m)*Sqrt
[1 - c^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
```

```
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^{1+m}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{6+m} \\
&\quad+\frac{(5d)\int x^m(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx}{6+m} \\
&\quad-\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int x^{1+m}(1-c^2x^2)^2\,dx}{(6+m)\sqrt{1-c^2x^2}} \\
&= \frac{5dx^{1+m}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{(4+m)(6+m)}+\frac{x^{1+m}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{6+m} \\
&\quad+\frac{(15d^2)\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx}{(4+m)(6+m)} \\
&\quad-\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\left(x^{1+m}-2c^2x^{3+m}+c^4x^{5+m}\right)dx}{(6+m)\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(5bcd^2\sqrt{d-c^2dx^2}\right)\int x^{1+m}(1-c^2x^2)\,dx}{(4+m)(6+m)\sqrt{1-c^2x^2}} \\
&= -\frac{bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{(12+8m+m^2)\sqrt{1-c^2x^2}}+\frac{2bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}}{(4+m)(6+m)\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^{6+m}\sqrt{d-c^2dx^2}}{(6+m)^2\sqrt{1-c^2x^2}} \\
&\quad+\frac{15d^2x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(2+m)(4+m)(6+m)}+\frac{5dx^{1+m}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{(4+m)(6+m)} \\
&\quad+\frac{x^{1+m}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{6+m}-\frac{\left(5bcd^2\sqrt{d-c^2dx^2}\right)\int\left(x^{1+m}-c^2x^{3+m}\right)dx}{(4+m)(6+m)\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(15d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^m(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{(2+m)(4+m)(6+m)\sqrt{1-c^2x^2}}-\frac{\left(15bcd^2\sqrt{d-c^2dx^2}\right)\int x^{1+m}\,dx}{(2+m)(4+m)(6+m)\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{15bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2(4+m)(6+m)\sqrt{1-c^2x^2}} - \frac{5bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{(2+m)(4+m)(6+m)\sqrt{1-c^2x^2}}$$
$$- \frac{bcd^2x^{2+m}\sqrt{d-c^2dx^2}}{(12+8m+m^2)\sqrt{1-c^2x^2}} + \frac{5bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}}{(4+m)^2(6+m)\sqrt{1-c^2x^2}}$$
$$+ \frac{2bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}}{(4+m)(6+m)\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^{6+m}\sqrt{d-c^2dx^2}}{(6+m)^2\sqrt{1-c^2x^2}}$$
$$+ \frac{15d^2x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(2+m)(4+m)(6+m)}$$
$$+ \frac{5dx^{1+m}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{(4+m)(6+m)} + \frac{x^{1+m}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{6+m}$$
$$+ \frac{15d^2x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)}{(1+m)(2+m)(4+m)(6+m)\sqrt{1-c^2x^2}}$$
$$- \frac{15bcd^2x^{2+m}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};c^2x^2\right)}{(1+m)(2+m)^2(4+m)(6+m)\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.83 (sec) , antiderivative size = 338, normalized size of antiderivative = 0.53

$$\int x^m(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))\,dx = \frac{d^2x^{1+m}\sqrt{d-c^2dx^2}\Big(-bc(1+m)(2+m)(4+m)x((4+m)(6+m)-2c^2(2+m)(6+m}{}$$

```
[In] Integrate[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*x^(1 + m)*Sqrt[d - c^2*d*x^2]*(-(b*c*(1 + m)*(2 + m)*(4 + m)*x*((4 + m
)*(6 + m) - 2*c^2*(2 + m)*(6 + m)*x^2 + c^4*(2 + m)*(4 + m)*x^4)) + (1 + m)
*(2 + m)^2*(4 + m)^2*(6 + m)*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]) - 5*(6
 + m)*(b*c*(1 + m)*(2 + m)*x*(4 + m - c^2*(2 + m)*x^2) - (1 + m)*(2 + m)^2*
(4 + m)*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]) + 3*(4 + m)*(b*c*(1 + m)*x
- (1 + m)*(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (2 + m)*(a + b*Ar
cSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2] + b*c*x*Hy
pergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2]))))/(
(1 + m)*(2 + m)^2*(4 + m)^2*(6 + m)^2*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int x^{m} \left(-c^{2} d \,x^{2}+d \right)^{\frac{5}{2}} \left(a +b \arcsin \left(c x \right)\right)d x$$

[In] int(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x)

[Out] int(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x)

Fricas [F]

$$\int x^m \left(d-c^2 d x^2\right)^{5/2} (a+b \arcsin(cx)) \, dx = \int \left(-c^{2} d x^{2} + d\right)^{\frac{5}{2}} {\left(b \arcsin\left(c x\right) + a\right)} x^{m} \,d x$$

[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c^2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*x^m, x)

Sympy [F(-1)]

Timed out.

$$\int x^m \left(d-c^2 d x^2\right)^{5/2} (a+b \arcsin(cx)) \, dx = \text{Timed out}$$

[In] integrate(x**m*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)

[Out] Timed out

Maxima [F]

$$\int x^m \left(d-c^2 d x^2\right)^{5/2} (a+b \arcsin(cx)) \, dx = \int \left(-c^{2} d x^{2} + d\right)^{\frac{5}{2}} {\left(b \arcsin\left(c x\right) + a\right)} x^{m} \,d x$$

[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)*x^m, x)

Giac [F(-2)]

Exception generated.

$$\int x^m \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x^m \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int x^m\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

3.150 $\int x^m(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 399

$$\begin{aligned}\int x^m(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx &= -\frac{3bcdx^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2(4+m)\sqrt{1-c^2x^2}}\\ &- \frac{bcdx^{2+m}\sqrt{d-c^2dx^2}}{(8+6m+m^2)\sqrt{1-c^2x^2}}+\frac{bc^3dx^{4+m}\sqrt{d-c^2dx^2}}{(4+m)^2\sqrt{1-c^2x^2}}\\ &+ \frac{3dx^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8+6m+m^2}+\frac{x^{1+m}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{4+m}\\ &+ \frac{3dx^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)}{(8+14m+7m^2+m^3)\sqrt{1-c^2x^2}}\\ &- \frac{3bcdx^{2+m}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};c^2x^2\right)}{(1+m)(2+m)^2(4+m)\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] x^(1+m)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(4+m)+3*d*x^(1+m)*(a+b*arcsi
n(c*x))*(-c^2*d*x^2+d)^(1/2)/(m^2+6*m+8)-3*b*c*d*x^(2+m)*(-c^2*d*x^2+d)^(1/
2)/(2+m)^2/(4+m)/(-c^2*x^2+1)^(1/2)-b*c*d*x^(2+m)*(-c^2*d*x^2+d)^(1/2)/(m^2
+6*m+8)/(-c^2*x^2+1)^(1/2)+b*c^3*d*x^(4+m)*(-c^2*d*x^2+d)^(1/2)/(4+m)^2/(-c
^2*x^2+1)^(1/2)+3*d*x^(1+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1/2+1/2*m],[3
/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(m^3+7*m^2+14*m+8)/(-c^2*x^2+1)^(1/
2)-3*b*c*d*x^(2+m)*hypergeom([1, 1+1/2*m, 1+1/2*m],[2+1/2*m, 3/2+1/2*m],c^2
*x^2)*(-c^2*d*x^2+d)^(1/2)/(2+m)^2/(m^2+5*m+4)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 399, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {4787, 4783, 4805, 30, 14}

$$\int x^m\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=-\frac{3bcdx^{m+2}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{(m+1)(m+2)^2(m+4)\sqrt{1-c^2x^2}}+\frac{3dx^{m+1}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},c^2x^2\right)(a+b\arcsin(cx))}{(m^3+7m^2+14m+8)\sqrt{1-c^2x^2}}+\frac{3dx^{m+1}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{m^2+6m+8}+\frac{x^{m+1}\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{m+4}-\frac{bcdx^{m+2}\sqrt{d-c^2dx^2}}{(m^2+6m+8)\sqrt{1-c^2x^2}}-\frac{3bcdx^{m+2}\sqrt{d-c^2dx^2}}{(m+2)^2(m+4)\sqrt{1-c^2x^2}}+\frac{bc^3dx^{m+4}\sqrt{d-c^2dx^2}}{(m+4)^2\sqrt{1-c^2x^2}}$$

```
[In] Int[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-3*b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((2 + m)^2*(4 + m)*Sqrt[1 - c^2*x^
2]) - (b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((8 + 6*m + m^2)*Sqrt[1 - c^2*x
^2]) + (b*c^3*d*x^(4 + m)*Sqrt[d - c^2*d*x^2])/((4 + m)^2*Sqrt[1 - c^2*x^2]
) + (3*d*x^(1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8 + 6*m + m^2)
 + (x^(1 + m)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(4 + m) + (3*d*x^(
1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 +
m)/2, (3 + m)/2, c^2*x^2])/((8 + 14*m + 7*m^2 + m^3)*Sqrt[1 - c^2*x^2]) - (
3*b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/
2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/((1 + m)*(2 + m)^2*(4 + m)*Sqrt[1 - c^2
*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
```

```
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^{1+m}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{4+m} + \frac{(3d)\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx}{4+m} \\
&\quad - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int x^{1+m}(1-c^2x^2)\,dx}{(4+m)\sqrt{1-c^2x^2}} \\
&= \frac{3dx^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8+6m+m^2} + \frac{x^{1+m}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{4+m} \\
&\quad - \frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int (x^{1+m}-c^2x^{3+m})\,dx}{(4+m)\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(3d\sqrt{d-c^2dx^2}\right)\int \frac{x^m(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{(2+m)(4+m)\sqrt{1-c^2x^2}} - \frac{\left(3bcd\sqrt{d-c^2dx^2}\right)\int x^{1+m}\,dx}{(2+m)(4+m)\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{3bcdx^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2(4+m)\sqrt{1-c^2x^2}} - \frac{bcdx^{2+m}\sqrt{d-c^2dx^2}}{(8+6m+m^2)\sqrt{1-c^2x^2}} + \frac{bc^3dx^{4+m}\sqrt{d-c^2dx^2}}{(4+m)^2\sqrt{1-c^2x^2}}$$
$$+ \frac{3dx^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8+6m+m^2} + \frac{x^{1+m}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{4+m}$$
$$+ \frac{3dx^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)}{(8+14m+7m^2+m^3)\sqrt{1-c^2x^2}}$$
$$- \frac{3bcdx^{2+m}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};c^2x^2\right)}{(1+m)(2+m)^2(4+m)\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.37 (sec) , antiderivative size = 237, normalized size of antiderivative = 0.59

$$\int x^m(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))\,dx = \frac{dx^{1+m}\sqrt{d-c^2dx^2}\left(-\frac{bcx(4+m-c^2(2+m)x^2)}{(2+m)(4+m)\sqrt{1-c^2x^2}} + (1-c^2x^2)(a+b\arcsin(cx)) - \frac{3\left(bc(1+m)x-(1+\cdots\right.}{\cdots}\right.}{\cdots}$$

```
[In] Integrate[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*x^(1 + m)*Sqrt[d - c^2*d*x^2]*(-((b*c*x*(4 + m - c^2*(2 + m)*x^2))/((2 +
 m)*(4 + m)*Sqrt[1 - c^2*x^2])) + (1 - c^2*x^2)*(a + b*ArcSin[c*x]) - (3*(b
*c*(1 + m)*x - (1 + m)*(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (2 +
 m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^
2] + b*c*x*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c
^2*x^2]))/((1 + m)*(2 + m)^2*Sqrt[1 - c^2*x^2])))/(4 + m)
```

Maple [F]

$$\int x^m\left(-c^2d\,x^2+d\right)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)dx$$

```
[In] int(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$\int x^m (d - c^2 dx^2)^{3/2} (a + b \arcsin(cx)) \, dx = \int (-c^2 dx^2 + d)^{\frac{3}{2}} (b \arcsin(cx) + a) x^m \, dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d)*x^m, x)
```

Sympy [F(-1)]

Timed out.

$$\int x^m (d - c^2 dx^2)^{3/2} (a + b \arcsin(cx)) \, dx = \text{Timed out}$$

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
[Out] Timed out
```

Maxima [F]

$$\int x^m (d - c^2 dx^2)^{3/2} (a + b \arcsin(cx)) \, dx = \int (-c^2 dx^2 + d)^{\frac{3}{2}} (b \arcsin(cx) + a) x^m \, dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)*x^m, x)
```

Giac [F(-2)]

Exception generated.

$$\int x^m (d - c^2 dx^2)^{3/2} (a + b \arcsin(cx)) \, dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x^m (d - c^2dx^2)^{3/2} (a + b \arcsin(cx)) \, dx = \int x^m (a + b \operatorname{asin}(c x)) \left(d - c^2 d x^2\right)^{3/2} dx$$

```
[In] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

3.151 $\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 245

$$\begin{aligned}
&\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx\\
&=-\frac{bcx^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2+m}\\
&\quad+\frac{x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)}{(2+3m+m^2)\sqrt{1-c^2x^2}}\\
&\quad-\frac{bcx^{2+m}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};c^2x^2\right)}{(1+m)(2+m)^2\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] x^(1+m)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(2+m)-b*c*x^(2+m)*(-c^2*d*x^
2+d)^(1/2)/(2+m)^2/(-c^2*x^2+1)^(1/2)+x^(1+m)*(a+b*arcsin(c*x))*hypergeom([
1/2, 1/2+1/2*m],[3/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(m^2+3*m+2)/(-c^2
*x^2+1)^(1/2)-b*c*x^(2+m)*hypergeom([1, 1+1/2*m, 1+1/2*m],[2+1/2*m, 3/2+1/2
*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(1+m)/(2+m)^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used

$= \{4783, 4805, 30\}$

$$\int x^m \sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$= -\frac{bcx^{m+2}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{(m+1)(m+2)^2\sqrt{1-c^2x^2}}$$
$$+\frac{x^{m+1}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},c^2x^2\right)(a+b\arcsin(cx))}{(m^2+3m+2)\sqrt{1-c^2x^2}}$$
$$+\frac{x^{m+1}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{m+2}-\frac{bcx^{m+2}\sqrt{d-c^2dx^2}}{(m+2)^2\sqrt{1-c^2x^2}}$$

```
[In] Int[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] -((b*c*x^(2 + m)*Sqrt[d - c^2*d*x^2])/((2 + m)^2*Sqrt[1 - c^2*x^2])) + (x^(
1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(2 + m) + (x^(1 + m)*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)
/2, c^2*x^2])/((2 + 3*m + m^2)*Sqrt[1 - c^2*x^2]) - (b*c*x^(2 + m)*Sqrt[d -
 c^2*d*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2},
c^2*x^2])/((1 + m)*(2 + m)^2*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2+m} \\ &\quad+\frac{\sqrt{d-c^2dx^2}\int\frac{x^m(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{(2+m)\sqrt{1-c^2x^2}}-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int x^{1+m}\,dx}{(2+m)\sqrt{1-c^2x^2}} \\ &= -\frac{bcx^{2+m}\sqrt{d-c^2dx^2}}{(2+m)^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2+m} \\ &\quad+\frac{x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)}{(2+3m+m^2)\sqrt{1-c^2x^2}} \\ &\quad-\frac{bcx^{2+m}\sqrt{d-c^2dx^2}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};c^2x^2\right)}{(1+m)(2+m)^2\sqrt{1-c^2x^2}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 181, normalized size of antiderivative = 0.74

$$\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{x^{1+m}\sqrt{d-c^2dx^2}\left((1+m)\left(-bcx+a(2+m)\sqrt{1-c^2x^2}+b(2+m)\sqrt{1-c^2x^2}\arcsin(cx)\right)+(2+m)(a+b\right.}{(1+m)(2+m)^2}$$

```
[In] Integrate[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (x^(1 + m)*Sqrt[d - c^2*d*x^2]*((1 + m)*(-(b*c*x) + a*(2 + m)*Sqrt[1 - c^2*
x^2] + b*(2 + m)*Sqrt[1 - c^2*x^2]*ArcSin[c*x]) + (2 + m)*(a + b*ArcSin[c*x
])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2] - b*c*x*Hypergeome
tricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2]))/((1 + m)*(2
 + m)^2*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int x^m\sqrt{-c^2d\,x^2+d}\,(a+b\arcsin(cx))\,dx$$

```
[In] int(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)x^m\,dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m, x)
```

Sympy [F]

$$\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int x^m\sqrt{-d(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))\,dx$$

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
[Out] Integral(x**m*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)x^m\,dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m, x)
```

Giac [F(-2)]

Exception generated.

$$\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int x^m\,(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
[Out] int(x^m*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

3.152 $\int \frac{x^m(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 163

$$\int \frac{x^m(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{x^{1+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)}{(1+m)\sqrt{d-c^2dx^2}} - \frac{bcx^{2+m}\sqrt{1-c^2x^2}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};c^2x^2\right)}{(2+3m+m^2)\sqrt{d-c^2dx^2}}$$

```
[Out] x^(1+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],c^2*x^2)*(
-c^2*x^2+1)^(1/2)/(1+m)/(-c^2*d*x^2+d)^(1/2)-b*c*x^(2+m)*hypergeom([1, 1+1/
2*m, 1+1/2*m],[2+1/2*m, 3/2+1/2*m],c^2*x^2)*(-c^2*x^2+1)^(1/2)/(m^2+3*m+2)/
(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.037, Rules used = {4805}

$$\int \frac{x^m(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{\sqrt{1-c^2x^2}x^{m+1}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},c^2x^2\right)(a+b\arcsin(cx))}{(m+1)\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}x^{m+2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{(m^2+3m+2)\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (x^(1 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1
+ m)/2, (3 + m)/2, c^2*x^2])/((1 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*x^(2 + m)
*Sqrt[1 - c^2*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2])/((2 + 3*m + m^2)*Sqrt[d - c^2*d*x^2])
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\text{integral} = \frac{x^{1+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)}{(1+m)\sqrt{d-c^2dx^2}} - \frac{bcx^{2+m}\sqrt{1-c^2x^2}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};c^2x^2\right)}{(2+3m+m^2)\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.79

$$\int \frac{x^m(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{x^{1+m}\sqrt{1-c^2x^2}\left((2+m)(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)-bcx\,{}_3F_2\left(1,1+\frac{m}{2},1+\right.\right.}{(1+m)(2+m)\sqrt{d-c^2dx^2}}$$

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (x^(1 + m)*Sqrt[1 - c^2*x^2]*((2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1
[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2] - b*c*x*HypergeometricPFQ[{1, 1 + m/2,
 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2]))/((1 + m)*(2 + m)*Sqrt[d - c^2*d
*x^2])
```

Maple [F]

$$\int \frac{x^m(a+b\arcsin(cx))}{\sqrt{-c^2d\,x^2+d}}dx$$

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

Fricas [F]

$$\int \frac{x^m(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)x^m}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m/(c^2*d*x^2 - d), x)
```

Sympy [F]

$$\int \frac{x^m(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x^m(a+b\operatorname{asin}(cx))}{\sqrt{-d(cx-1)(cx+1)}}\,dx$$

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral(x**m*(a + b*asin(c*x))/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Maxima [F]

$$\int \frac{x^m(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)x^m}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(c*x) + a)*x^m/sqrt(-c^2*d*x^2 + d), x)
```

Giac [F]

$$\int \frac{x^m(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(b\arcsin{(cx)}+a)x^m}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^m/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^m(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{x^m\,(a+b\,\mathrm{asin}(c\,x))}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
[Out] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

3.153 $\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 272

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{x^{1+m}(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}} - \frac{mx^{1+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)}{d(1+m)\sqrt{d-c^2dx^2}} - \frac{bcx^{2+m}\sqrt{1-c^2x^2}\,\text{Hypergeometric2F1}\left(1,\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{d(2+m)\sqrt{d-c^2dx^2}} + \frac{bcmx^{2+m}\sqrt{1-c^2x^2}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};c^2x^2\right)}{d\left(2+3m+m^2\right)\sqrt{d-c^2dx^2}}$$

```
[Out] x^(1+m)*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(1/2)-m*x^(1+m)*(a+b*arcsin(c*x)
)*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],c^2*x^2)*(-c^2*x^2+1)^(1/2)/d/(1+m
)/(-c^2*d*x^2+d)^(1/2)-b*c*x^(2+m)*hypergeom([1, 1+1/2*m],[2+1/2*m],c^2*x^2
)*(-c^2*x^2+1)^(1/2)/d/(2+m)/(-c^2*d*x^2+d)^(1/2)+b*c*m*x^(2+m)*hypergeom([
1, 1+1/2*m, 1+1/2*m],[2+1/2*m, 3/2+1/2*m],c^2*x^2)*(-c^2*x^2+1)^(1/2)/d/(m^
2+3*m+2)/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 272, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {4793, 4805, 371}

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{bcm\sqrt{1-c^2x^2}x^{m+2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{d\left(m^2+3m+2\right)\sqrt{d-c^2dx^2}}$$
$$-\frac{m\sqrt{1-c^2x^2}x^{m+1}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},c^2x^2\right)(a+b\arcsin(cx))}{d(m+1)\sqrt{d-c^2dx^2}}$$
$$+\frac{x^{m+1}(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}x^{m+2}\,\text{Hypergeometric2F1}\left(1,\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{d(m+2)\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(d*Sqrt[d - c^2*d*x^2]) - (m*x^(1 + m)*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)
/2, c^2*x^2])/(d*(1 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*x^(2 + m)*Sqrt[1 - c^2
*x^2]*Hypergeometric2F1[1, (2 + m)/2, (4 + m)/2, c^2*x^2])/(d*(2 + m)*Sqrt[
d - c^2*d*x^2]) + (b*c*m*x^(2 + m)*Sqrt[1 - c^2*x^2]*HypergeometricPFQ[{1,
1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/(d*(2 + 3*m + m^2)*Sqrt[
d - c^2*d*x^2])
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
```

```
(3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{x^{1+m}(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}} - \frac{m\int \frac{x^m(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx}{d} - \frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{x^{1+m}}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}\\ &= \frac{x^{1+m}(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}\\ &\quad - \frac{mx^{1+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)}{d(1+m)\sqrt{d-c^2dx^2}}\\ &\quad - \frac{bcx^{2+m}\sqrt{1-c^2x^2}\,\text{Hypergeometric2F1}\left(1,\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{d(2+m)\sqrt{d-c^2dx^2}}\\ &\quad + \frac{bcmx^{2+m}\sqrt{1-c^2x^2}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};c^2x^2\right)}{d\left(2+3m+m^2\right)\sqrt{d-c^2dx^2}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 207, normalized size of antiderivative = 0.76

$$\int \frac{x^m(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{x^{1+m}\left(-m(2+m)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+}{}\right.\right.}{}$$

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x^(1 + m)*(-(m*(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometri
c2F1[1/2, (1 + m)/2, (3 + m)/2, c^2*x^2]) + (1 + m)*((2 + m)*(a + b*ArcSin[
c*x]) - b*c*x*Sqrt[1 - c^2*x^2]*Hypergeometric2F1[1, 1 + m/2, 2 + m/2, c^2*
x^2]) + b*c*m*x*Sqrt[1 - c^2*x^2]*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2},
{3/2 + m/2, 2 + m/2}, c^2*x^2]))/(d*(1 + m)*(2 + m)*Sqrt[d - c^2*d*x^2])
```

Maple [F]

$$\int \frac{x^m(a+b\arcsin(cx))}{\left(-c^2d\,x^2+d\right)^{\frac{3}{2}}}dx$$

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

Fricas [F]

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)x^m}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m/(c^4*d^2*x^4 - 2*c^2*
d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^m(a+b\,\mathrm{asin}\,(cx))}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**m*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)x^m}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^m/(-c^2*d*x^2 + d)^(3/2), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^m\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
[Out] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.154 $\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 408

$$\begin{aligned}\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx &= \frac{x^{1+m}(a+b\arcsin(cx))}{3d\,(d-c^2dx^2)^{3/2}}+\frac{(2-m)x^{1+m}(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}\\
&-\frac{(2-m)mx^{1+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)}{3d^2(1+m)\sqrt{d-c^2dx^2}}\\
&-\frac{bc(2-m)x^{2+m}\sqrt{1-c^2x^2}\operatorname{Hypergeometric2F1}\left(1,\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{3d^2(2+m)\sqrt{d-c^2dx^2}}\\
&-\frac{bcx^{2+m}\sqrt{1-c^2x^2}\operatorname{Hypergeometric2F1}\left(2,\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{3d^2(2+m)\sqrt{d-c^2dx^2}}\\
&+\frac{bc(2-m)mx^{2+m}\sqrt{1-c^2x^2}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};c^2x^2\right)}{3d^2\left(2+3m+m^2\right)\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] 1/3*x^(1+m)*(a+b*arcsin(c*x))/d/(-c^2*d*x^2+d)^(3/2)+1/3*(2-m)*x^(1+m)*(a+b
*arcsin(c*x))/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*(2-m)*m*x^(1+m)*(a+b*arcsin(c*x)
)*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],c^2*x^2)*(-c^2*x^2+1)^(1/2)/d^2/(1
+m)/(-c^2*d*x^2+d)^(1/2)-1/3*b*c*(2-m)*x^(2+m)*hypergeom([1, 1+1/2*m],[2+1/
2*m],c^2*x^2)*(-c^2*x^2+1)^(1/2)/d^2/(2+m)/(-c^2*d*x^2+d)^(1/2)-1/3*b*c*x^(
2+m)*hypergeom([2, 1+1/2*m],[2+1/2*m],c^2*x^2)*(-c^2*x^2+1)^(1/2)/d^2/(2+m)
/(-c^2*d*x^2+d)^(1/2)+1/3*b*c*(2-m)*m*x^(2+m)*hypergeom([1, 1+1/2*m, 1+1/2*
m],[2+1/2*m, 3/2+1/2*m],c^2*x^2)*(-c^2*x^2+1)^(1/2)/d^2/(m^2+3*m+2)/(-c^2*d
*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 408, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {4793, 4805, 371}

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{bc(2-m)m\sqrt{1-c^2x^2}x^{m+2}\,{}_3F_2\left(1,\frac{m}{2}+1,\frac{m}{2}+1;\frac{m}{2}+\frac{3}{2},\frac{m}{2}+2;c^2x^2\right)}{3d^2\left(m^2+3m+2\right)\sqrt{d-c^2dx^2}}$$
$$-\frac{(2-m)m\sqrt{1-c^2x^2}x^{m+1}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+1}{2},\frac{m+3}{2},c^2x^2\right)(a+b\arcsin(cx))}{3d^2(m+1)\sqrt{d-c^2dx^2}}$$
$$+\frac{(2-m)x^{m+1}(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}+\frac{x^{m+1}(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}$$
$$-\frac{bc(2-m)\sqrt{1-c^2x^2}x^{m+2}\,\text{Hypergeometric2F1}\left(1,\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{3d^2(m+2)\sqrt{d-c^2dx^2}}$$
$$-\frac{bc\sqrt{1-c^2x^2}x^{m+2}\,\text{Hypergeometric2F1}\left(2,\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{3d^2(m+2)\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (x^(1 + m)*(a + b*ArcSin[c*x]))/(3*d*(d - c^2*d*x^2)^(3/2)) + ((2 - m)*x^(1
 + m)*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d - c^2*d*x^2]) - ((2 - m)*m*x^(1 +
m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
(3 + m)/2, c^2*x^2])/(3*d^2*(1 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*(2 - m)*x^(
2 + m)*Sqrt[1 - c^2*x^2]*Hypergeometric2F1[1, (2 + m)/2, (4 + m)/2, c^2*x^2
])/(3*d^2*(2 + m)*Sqrt[d - c^2*d*x^2]) - (b*c*x^(2 + m)*Sqrt[1 - c^2*x^2]*H
ypergeometric2F1[2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(3*d^2*(2 + m)*Sqrt[d -
 c^2*d*x^2]) + (b*c*(2 - m)*m*x^(2 + m)*Sqrt[1 - c^2*x^2]*HypergeometricPFQ
[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2])/(3*d^2*(2 + 3*m + m
^2)*Sqrt[d - c^2*d*x^2])
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
```

```
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^{1+m}(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{(2-m)\int\frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx}{3d}-\frac{\left(bc\sqrt{1-c^2x^2}\right)\int\frac{x^{1+m}}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}\\
&= \frac{x^{1+m}(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{(2-m)x^{1+m}(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{bcx^{2+m}\sqrt{1-c^2x^2}\,\text{Hypergeometric2F1}\left(2,\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{3d^2(2+m)\sqrt{d-c^2dx^2}}\\
&\quad-\frac{((2-m)m)\int\frac{x^m(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx}{3d^2}-\frac{\left(bc(2-m)\sqrt{1-c^2x^2}\right)\int\frac{x^{1+m}}{1-c^2x^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}\\
&= \frac{x^{1+m}(a+b\arcsin(cx))}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{(2-m)x^{1+m}(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{(2-m)mx^{1+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},c^2x^2\right)}{3d^2(1+m)\sqrt{d-c^2dx^2}}\\
&\quad-\frac{bc(2-m)x^{2+m}\sqrt{1-c^2x^2}\,\text{Hypergeometric2F1}\left(1,\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{3d^2(2+m)\sqrt{d-c^2dx^2}}\\
&\quad-\frac{bcx^{2+m}\sqrt{1-c^2x^2}\,\text{Hypergeometric2F1}\left(2,\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{3d^2(2+m)\sqrt{d-c^2dx^2}}\\
&\quad+\frac{bc(2-m)mx^{2+m}\sqrt{1-c^2x^2}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};c^2x^2\right)}{3d^2\left(2+3m+m^2\right)\sqrt{d-c^2dx^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.25 (sec) , antiderivative size = 279, normalized size of antiderivative = 0.68

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{x^{1+m}\Big(d(1+m)(2+m)(a+b\arcsin(cx))-bcd(1+m)x(1-c^2x^2)^{3/2}\,\text{Hyperg}}{}$$

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (x^(1 + m)*(d*(1 + m)*(2 + m)*(a + b*ArcSin[c*x]) - b*c*d*(1 + m)*x*(1 - c^
2*x^2)^(3/2)*Hypergeometric2F1[2, 1 + m/2, 2 + m/2, c^2*x^2] + (2 - m)*(d -
 c^2*d*x^2)*((1 + m)*(2 + m)*(a + b*ArcSin[c*x]) - b*c*(1 + m)*x*Sqrt[1 - c
^2*x^2]*Hypergeometric2F1[1, 1 + m/2, 2 + m/2, c^2*x^2] - m*Sqrt[1 - c^2*x^
2]*((2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2
, c^2*x^2] - b*c*x*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 +
 m/2}, c^2*x^2]))))/(3*d^2*(1 + m)*(2 + m)*(d - c^2*d*x^2)^(3/2))
```

Maple [F]

$$\int \frac{x^m(a+b\arcsin(cx))}{(-c^2d\,x^2+d)^{\frac{5}{2}}}dx$$

```
[In] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

Fricas [F]

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)x^m}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)*x^m/(c^6*d^3*x^6 - 3*c^4
*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^m(a+b\operatorname{asin}(cx))}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x**m*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral(x**m*(a + b*asin(c*x))/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)x^m}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(c*x) + a)*x^m/(-c^2*d*x^2 + d)^(5/2), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^m(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^m\,(a+b\operatorname{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
[Out] int((x^m*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

3.155 $\int \frac{x^m \arcsin(ax)}{\sqrt{1-a^2x^2}} dx$

Optimal result

Integrand size = 22, antiderivative size = 100

$$\int \frac{x^m \arcsin(ax)}{\sqrt{1-a^2x^2}} dx = \frac{x^{1+m} \arcsin(ax) \text{Hypergeometric2F1}\left(\frac{1}{2}, \frac{1+m}{2}, \frac{3+m}{2}, a^2x^2\right)}{1+m} - \frac{ax^{2+m} {}_3F_2\left(1, 1+\frac{m}{2}, 1+\frac{m}{2}; \frac{3}{2}+\frac{m}{2}, 2+\frac{m}{2}; a^2x^2\right)}{2+3m+m^2}$$

```
[Out] x^(1+m)*arcsin(a*x)*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],a^2*x^2)/(1+m)-a
*x^(2+m)*hypergeom([1, 1+1/2*m, 1+1/2*m],[2+1/2*m, 3/2+1/2*m],a^2*x^2)/(m^2
+3*m+2)
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.045, Rules used = {4805}

$$\int \frac{x^m \arcsin(ax)}{\sqrt{1-a^2x^2}} dx = \frac{x^{m+1} \arcsin(ax) \text{Hypergeometric2F1}\left(\frac{1}{2}, \frac{m+1}{2}, \frac{m+3}{2}, a^2x^2\right)}{m+1} - \frac{ax^{m+2} {}_3F_2\left(1, \frac{m}{2}+1, \frac{m}{2}+1; \frac{m}{2}+\frac{3}{2}, \frac{m}{2}+2; a^2x^2\right)}{m^2+3m+2}$$

```
[In] Int[(x^m*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (x^(1 + m)*ArcSin[a*x]*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2, a^2*x^2
])/(1 + m) - (a*x^(2 + m)*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m
/2, 2 + m/2}, a^2*x^2])/(2 + 3*m + m^2)
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\text{integral} = \frac{x^{1+m}\arcsin(ax)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},a^2x^2\right)}{1+m} - \frac{ax^{2+m}\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};a^2x^2\right)}{2+3m+m^2}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.95

$$\int \frac{x^m\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \frac{x^{1+m}\left((2+m)\arcsin(ax)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},a^2x^2\right)-ax\,{}_3F_2\left(1,1+\frac{m}{2},1+\frac{m}{2};\frac{3}{2}+\frac{m}{2},2+\frac{m}{2};\right.\right.}{(1+m)(2+m)}$$

```
[In] Integrate[(x^m*ArcSin[a*x])/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (x^(1 + m)*((2 + m)*ArcSin[a*x]*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2
, a^2*x^2] - a*x*HypergeometricPFQ[{1, 1 + m/2, 1 + m/2}, {3/2 + m/2, 2 + m
/2}, a^2*x^2]))/((1 + m)*(2 + m))
```

Maple [F]

$$\int \frac{x^m\arcsin(ax)}{\sqrt{-a^2x^2+1}}dx$$

```
[In] int(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Fricas [F]

$$\int \frac{x^m \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin\left(ax\right)}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m*arcsin(a*x)/(a^2*x^2 - 1), x)
```

Sympy [F]

$$\int \frac{x^m \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \operatorname{asin}\left(ax\right)}{\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

```
[In] integrate(x**m*asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x**m*asin(a*x)/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Maxima [F]

$$\int \frac{x^m \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin\left(ax\right)}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^m*arcsin(a*x)/sqrt(-a^2*x^2 + 1), x)
```

Giac [F]

$$\int \frac{x^m \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin\left(ax\right)}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^m*arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(x^m*arcsin(a*x)/sqrt(-a^2*x^2 + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^m \arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \operatorname{asin}(a\,x)}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^m*asin(a*x))/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^m*asin(a*x))/(1 - a^2*x^2)^(1/2), x)
```

3.156 $\int x^4(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 25, antiderivative size = 290

$$
\begin{aligned}
&\int x^4(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx\\
&= -\frac{304b^2dx}{3675c^4}-\frac{152b^2dx^3}{11025c^2}-\frac{38b^2dx^5}{6125}+\frac{2}{343}b^2c^2dx^7\\
&\quad+\frac{32bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{525c^5}+\frac{16bdx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{525c^3}\\
&\quad+\frac{4bdx^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{175c}+\frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{21c^5}\\
&\quad-\frac{4bd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{35c^5}+\frac{2bd(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c^5}\\
&\quad+\frac{2}{35}dx^5(a+b\arcsin(cx))^2+\frac{1}{7}dx^5(1-c^2x^2)(a+b\arcsin(cx))^2
\end{aligned}
$$

```
[Out] -304/3675*b^2*d*x/c^4-152/11025*b^2*d*x^3/c^2-38/6125*b^2*d*x^5+2/343*b^2*c
^2*d*x^7+2/21*b*d*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c^5-4/35*b*d*(-c^2*x
^2+1)^(5/2)*(a+b*arcsin(c*x))/c^5+2/49*b*d*(-c^2*x^2+1)^(7/2)*(a+b*arcsin(c
*x))/c^5+2/35*d*x^5*(a+b*arcsin(c*x))^2+1/7*d*x^5*(-c^2*x^2+1)*(a+b*arcsin(
c*x))^2+32/525*b*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^5+16/525*b*d*x^2*
(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+4/175*b*d*x^4*(a+b*arcsin(c*x))*(-
c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 290, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4787, 4723, 4795, 4767, 8, 30, 272, 45, 4779, 12}

$$\begin{aligned}
&\int x^4\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx\\
&=\frac{1}{7}dx^5\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{4bdx^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{175c}\\
&\quad+\frac{2bd(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c^5}-\frac{4bd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{35c^5}\\
&\quad+\frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{21c^5}+\frac{32bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{525c^5}\\
&\quad+\frac{16bdx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{525c^3}\\
&\quad+\frac{2}{35}dx^5(a+b\arcsin(cx))^2-\frac{304b^2dx}{3675c^4}+\frac{2}{343}b^2c^2dx^7-\frac{152b^2dx^3}{11025c^2}-\frac{38b^2dx^5}{6125}
\end{aligned}$$

```
[In] Int[x^4*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-304*b^2*d*x)/(3675*c^4) - (152*b^2*d*x^3)/(11025*c^2) - (38*b^2*d*x^5)/61
25 + (2*b^2*c^2*d*x^7)/343 + (32*b*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))
/(525*c^5) + (16*b*d*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(525*c^3) +
 (4*b*d*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(175*c) + (2*b*d*(1 - c^
2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(21*c^5) - (4*b*d*(1 - c^2*x^2)^(5/2)*(a
+ b*ArcSin[c*x]))/(35*c^5) + (2*b*d*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x])
)/(49*c^5) + (2*d*x^5*(a + b*ArcSin[c*x])^2)/35 + (d*x^5*(1 - c^2*x^2)*(a +
 b*ArcSin[c*x])^2)/7
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{1}{7}dx^5\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{1}{7}(2d)\int x^4(a+b\arcsin(cx))^2\,dx \\ &\quad -\frac{1}{7}(2bcd)\int x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx \\ &= \frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{21c^5} \\ &\quad -\frac{4bd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{35c^5}+\frac{2bd(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c^5} \\ &\quad +\frac{2}{35}dx^5(a+b\arcsin(cx))^2+\frac{1}{7}dx^5\left(1-c^2x^2\right)(a+b\arcsin(cx))^2-\frac{1}{35}(4bcd)\int\frac{x^5(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\ &= \frac{4bdx^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{175c}+\frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{21c^5} \\ &\quad -\frac{4bd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{35c^5}+\frac{2bd(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c^5} \\ &\quad +\frac{2}{35}dx^5(a+b\arcsin(cx))^2+\frac{1}{7}dx^5\left(1-c^2x^2\right)(a+b\arcsin(cx))^2-\frac{1}{175}\left(4b^2d\right)\int x^4\,dx+\frac{(2b^2d)\int(-8 \\ &= -\frac{16b^2dx}{735c^4}-\frac{8b^2dx^3}{2205c^2}-\frac{38b^2dx^5}{6125}+\frac{2}{343}b^2c^2dx^7+\frac{16bdx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{525c^3} \\ &\quad +\frac{4bdx^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{175c}+\frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{21c^5} \\ &\quad -\frac{4bd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{35c^5}+\frac{2bd(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c^5} \\ &\quad +\frac{2}{35}dx^5(a+b\arcsin(cx))^2+\frac{1}{7}dx^5\left(1-c^2x^2\right)(a+b\arcsin(cx))^2-\frac{(32bd)\int\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{525c^3}-\frac{(16b^2d)}{52}\end{aligned}$$

$$
\begin{aligned}
&= -\frac{16b^2dx}{735c^4} - \frac{152b^2dx^3}{11025c^2} - \frac{38b^2dx^5}{6125} + \frac{2}{343}b^2c^2dx^7 \\
&\quad + \frac{32bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{525c^5} + \frac{16bdx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{525c^3} \\
&\quad + \frac{4bdx^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{175c} + \frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{21c^5} \\
&\quad - \frac{4bd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{35c^5} + \frac{2bd(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c^5} \\
&\quad + \frac{2}{35}dx^5(a+b\arcsin(cx))^2 + \frac{1}{7}dx^5(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{(32b^2d)\int 1\,dx}{525c^4} \\
&= -\frac{304b^2dx}{3675c^4} - \frac{152b^2dx^3}{11025c^2} - \frac{38b^2dx^5}{6125} + \frac{2}{343}b^2c^2dx^7 \\
&\quad + \frac{32bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{525c^5} + \frac{16bdx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{525c^3} \\
&\quad + \frac{4bdx^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{175c} + \frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{21c^5} \\
&\quad - \frac{4bd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{35c^5} + \frac{2bd(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c^5} \\
&\quad + \frac{2}{35}dx^5(a+b\arcsin(cx))^2 + \frac{1}{7}dx^5(1-c^2x^2)(a+b\arcsin(cx))^2
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 203, normalized size of antiderivative = 0.70

$$
\int x^4(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx =
$$

$$
-\frac{d\left(11025a^2c^5x^5(-7+5c^2x^2)+210ab\sqrt{1-c^2x^2}(-152-76c^2x^2-57c^4x^4+75c^6x^6)+b^2(31920cx+532\right.}{}
$$

```
[In] Integrate[x^4*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/385875*(d*(11025*a^2*c^5*x^5*(-7 + 5*c^2*x^2) + 210*a*b*Sqrt[1 - c^2*x^2
]*(-152 - 76*c^2*x^2 - 57*c^4*x^4 + 75*c^6*x^6) + b^2*(31920*c*x + 5320*c^3
*x^3 + 2394*c^5*x^5 - 2250*c^7*x^7) + 210*b*(105*a*c^5*x^5*(-7 + 5*c^2*x^2)
 + b*Sqrt[1 - c^2*x^2]*(-152 - 76*c^2*x^2 - 57*c^4*x^4 + 75*c^6*x^6))*ArcSi
n[c*x] + 11025*b^2*c^5*x^5*(-7 + 5*c^2*x^2)*ArcSin[c*x]^2))/c^5
```

Maple [A] (verified)

Time = 0.24 (sec) , antiderivative size = 275, normalized size of antiderivative = 0.95

method	result
parts	$-d\,a^2\left(\frac{1}{7}c^2x^7-\frac{1}{5}x^5\right)-\frac{d\,b^2\left(-\frac{\arcsin(cx)^2c^5x^5}{5}-\frac{2\arcsin(cx)\left(3c^4x^4+4c^2x^2+8\right)\sqrt{-c^2x^2+1}}{75}+\frac{38c^5x^5}{6125}+\frac{152c^3x^3}{11025}+\frac{304cx}{3675}\right.}{c^5}$
derivativedivides	$\frac{-d\,a^2\left(\frac{1}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-d\,b^2\left(-\frac{\arcsin(cx)^2c^5x^5}{5}-\frac{2\arcsin(cx)\left(3c^4x^4+4c^2x^2+8\right)\sqrt{-c^2x^2+1}}{75}+\frac{38c^5x^5}{6125}+\frac{152c^3x^3}{11025}+\frac{304cx}{3675}+\mathrm{arcsin}\right.}{}$
default	$\frac{-d\,a^2\left(\frac{1}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-d\,b^2\left(-\frac{\arcsin(cx)^2c^5x^5}{5}-\frac{2\arcsin(cx)\left(3c^4x^4+4c^2x^2+8\right)\sqrt{-c^2x^2+1}}{75}+\frac{38c^5x^5}{6125}+\frac{152c^3x^3}{11025}+\frac{304cx}{3675}+\mathrm{arcsin}\right.}{}$

```
[In] int(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -d*a^2*(1/7*c^2*x^7-1/5*x^5)-d*b^2/c^5*(-1/5*arcsin(c*x)^2*c^5*x^5-2/75*arc
sin(c*x)*(3*c^4*x^4+4*c^2*x^2+8)*(-c^2*x^2+1)^(1/2)+38/6125*c^5*x^5+152/110
25*c^3*x^3+304/3675*c*x+1/7*arcsin(c*x)^2*c^7*x^7+2/245*arcsin(c*x)*(5*c^6*
x^6+6*c^4*x^4+8*c^2*x^2+16)*(-c^2*x^2+1)^(1/2)-2/343*c^7*x^7)-2*d*a*b/c^5*(
1/7*arcsin(c*x)*c^7*x^7-1/5*arcsin(c*x)*c^5*x^5+1/49*c^6*x^6*(-c^2*x^2+1)^(
1/2)-19/1225*c^4*x^4*(-c^2*x^2+1)^(1/2)-76/3675*c^2*x^2*(-c^2*x^2+1)^(1/2)-
152/3675*(-c^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 229, normalized size of antiderivative = 0.79

$$\int x^4\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx = -\frac{1125\,(49\,a^2-2\,b^2)c^7dx^7-63\,(1225\,a^2-38\,b^2)c^5dx^5+5320\,b^2c^3dx^3+31920\,b^2cdx+11025\,(5\,b^2c^7dx^7-}{}$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/385875*(1125*(49*a^2 - 2*b^2)*c^7*d*x^7 - 63*(1225*a^2 - 38*b^2)*c^5*d*x
^5 + 5320*b^2*c^3*d*x^3 + 31920*b^2*c*d*x + 11025*(5*b^2*c^7*d*x^7 - 7*b^2*
c^5*d*x^5)*arcsin(c*x)^2 + 22050*(5*a*b*c^7*d*x^7 - 7*a*b*c^5*d*x^5)*arcsin
(c*x) + 210*(75*a*b*c^6*d*x^6 - 57*a*b*c^4*d*x^4 - 76*a*b*c^2*d*x^2 - 152*a
*b*d + (75*b^2*c^6*d*x^6 - 57*b^2*c^4*d*x^4 - 76*b^2*c^2*d*x^2 - 152*b^2*d)
*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] (verification not implemented)

Time = 0.88 (sec) , antiderivative size = 388, normalized size of antiderivative = 1.34

$$\int x^4(d-c^2dx^2)\left(a+b\arcsin(cx)\right)^2\,dx$$
$$=\begin{cases}-\frac{a^2c^2dx^7}{7}+\frac{a^2dx^5}{5}-\frac{2abc^2dx^7\operatorname{asin}(cx)}{7}-\frac{2abcdx^6\sqrt{-c^2x^2+1}}{49}+\frac{2abdx^5\operatorname{asin}(cx)}{5}+\frac{38abdx^4\sqrt{-c^2x^2+1}}{1225c}+\frac{152abdx^2\sqrt{-c^2x^2+1}}{3675c^3}\\ \frac{a^2dx^5}{5}\end{cases}$$

```
[In] integrate(x**4*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**7/7 + a**2*d*x**5/5 - 2*a*b*c**2*d*x**7*asin(c*x
)/7 - 2*a*b*c*d*x**6*sqrt(-c**2*x**2 + 1)/49 + 2*a*b*d*x**5*asin(c*x)/5 + 3
8*a*b*d*x**4*sqrt(-c**2*x**2 + 1)/(1225*c) + 152*a*b*d*x**2*sqrt(-c**2*x**2
 + 1)/(3675*c**3) + 304*a*b*d*sqrt(-c**2*x**2 + 1)/(3675*c**5) - b**2*c**2*
d*x**7*asin(c*x)**2/7 + 2*b**2*c**2*d*x**7/343 - 2*b**2*c*d*x**6*sqrt(-c**2
*x**2 + 1)*asin(c*x)/49 + b**2*d*x**5*asin(c*x)**2/5 - 38*b**2*d*x**5/6125
+ 38*b**2*d*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/(1225*c) - 152*b**2*d*x**3/
(11025*c**2) + 152*b**2*d*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(3675*c**3) -
 304*b**2*d*x/(3675*c**4) + 304*b**2*d*sqrt(-c**2*x**2 + 1)*asin(c*x)/(3675
*c**5), Ne(c, 0)), (a**2*d*x**5/5, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 453, normalized size of antiderivative = 1.56

$$\int x^4(d-c^2dx^2)\left(a+b\arcsin(cx)\right)^2\,dx$$
$$=-\frac{1}{7}b^2c^2dx^7\arcsin(cx)^2-\frac{1}{7}a^2c^2dx^7+\frac{1}{5}b^2dx^5\arcsin(cx)^2+\frac{1}{5}a^2dx^5$$
$$-\frac{2}{245}\left(35x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)\right.$$
$$-\frac{2}{25725}\left(105\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\arcsin(cx)\right.$$
$$+\frac{2}{75}\left(15x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abd$$
$$+\frac{2}{1125}\left(15\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\arcsin(cx)-\frac{9c^4x^5+20c^2x^3+12}{c^4}\right.$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/7*b^2*c^2*d*x^7*arcsin(c*x)^2 - 1/7*a^2*c^2*d*x^7 + 1/5*b^2*d*x^5*arcsin
(c*x)^2 + 1/5*a^2*d*x^5 - 2/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)
*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16
*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^2*d - 2/25725*(105*(5*sqrt(-c^2*x^2 + 1)*
x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*
sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7 + 126*c^4*x^5 + 280*c^2
*x^3 + 1680*x)/c^6)*b^2*c^2*d + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2
 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)
*a*b*d + 2/1125*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^
2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 +
 120*x)/c^4)*b^2*d
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 495, normalized size of antiderivative = 1.71

$$\int x^4(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx = -\frac{1}{7}a^2c^2dx^7+\frac{1}{5}a^2dx^5-\frac{(c^2x^2-1)^3b^2dx\arcsin(cx)^2}{7c^4} - \frac{2(c^2x^2-1)^3abdx\arcsin(cx)}{7c^4} - \frac{8(c^2x^2-1)^2b^2dx\arcsin(cx)^2}{35c^4} + \frac{2(c^2x^2-1)^3b^2dx}{343c^4} - \frac{16(c^2x^2-1)^2abdx\arcsin(cx)}{35c^4} - \frac{(c^2x^2-1)b^2dx\arcsin(cx)^2}{35c^4} - \frac{2(c^2x^2-1)^3\sqrt{-c^2x^2+1}b^2d\arcsin(cx)}{49c^5} + \frac{484(c^2x^2-1)^2b^2dx}{42875c^4} - \frac{2(c^2x^2-1)abdx\arcsin(cx)}{35c^4} + \frac{2b^2dx\arcsin(cx)^2}{35c^4} - \frac{2(c^2x^2-1)^3\sqrt{-c^2x^2+1}abd}{49c^5} - \frac{16(c^2x^2-1)^2\sqrt{-c^2x^2+1}b^2d\arcsin(cx)}{175c^5} - \frac{3358(c^2x^2-1)b^2dx}{385875c^4} + \frac{4abdx\arcsin(cx)}{35c^4} - \frac{16(c^2x^2-1)^2\sqrt{-c^2x^2+1}abd}{175c^5} + \frac{2(-c^2x^2+1)^{\frac{3}{2}}b^2d\arcsin(cx)}{105c^5} - \frac{37384b^2dx}{385875c^4} + \frac{2(-c^2x^2+1)^{\frac{3}{2}}abd}{105c^5} + \frac{4\sqrt{-c^2x^2+1}b^2d\arcsin(cx)}{35c^5} + \frac{4\sqrt{-c^2x^2+1}abd}{35c^5}$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/7*a^2*c^2*d*x^7 + 1/5*a^2*d*x^5 - 1/7*(c^2*x^2 - 1)^3*b^2*d*x*arcsin(c*x
)^2/c^4 - 2/7*(c^2*x^2 - 1)^3*a*b*d*x*arcsin(c*x)/c^4 - 8/35*(c^2*x^2 - 1)^
2*b^2*d*x*arcsin(c*x)^2/c^4 + 2/343*(c^2*x^2 - 1)^3*b^2*d*x/c^4 - 16/35*(c^
2*x^2 - 1)^2*a*b*d*x*arcsin(c*x)/c^4 - 1/35*(c^2*x^2 - 1)*b^2*d*x*arcsin(c*
```

```
x)^2/c^4 - 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d*arcsin(c*x)/c^5 +
484/42875*(c^2*x^2 - 1)^2*b^2*d*x/c^4 - 2/35*(c^2*x^2 - 1)*a*b*d*x*arcsin(c
*x)/c^4 + 2/35*b^2*d*x*arcsin(c*x)^2/c^4 - 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x
^2 + 1)*a*b*d/c^5 - 16/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d*arcsin(
c*x)/c^5 - 3358/385875*(c^2*x^2 - 1)*b^2*d*x/c^4 + 4/35*a*b*d*x*arcsin(c*x)
/c^4 - 16/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d/c^5 + 2/105*(-c^2*x^
2 + 1)^(3/2)*b^2*d*arcsin(c*x)/c^5 - 37384/385875*b^2*d*x/c^4 + 2/105*(-c^2
*x^2 + 1)^(3/2)*a*b*d/c^5 + 4/35*sqrt(-c^2*x^2 + 1)*b^2*d*arcsin(c*x)/c^5 +
 4/35*sqrt(-c^2*x^2 + 1)*a*b*d/c^5
```

Mupad [F(-1)]

Timed out.

$$\int x^4(d-c^2dx^2)\,(a+b\arcsin(cx))^2\,dx=\int x^4\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)\,dx$$

```
[In] int(x^4*(a + b*asin(c*x))^2*(d - c^2*d*x^2),x)
[Out] int(x^4*(a + b*asin(c*x))^2*(d - c^2*d*x^2), x)
```

3.157 $\int x^3(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 25, antiderivative size = 202

$$\int x^3(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx = -\frac{b^2dx^2}{24c^2}-\frac{1}{72}b^2dx^4+\frac{1}{108}b^2c^2dx^6 + \frac{bdx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{12c^3} + \frac{bdx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} - \frac{1}{18}bcdx^5\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{d(a+b\arcsin(cx))^2}{24c^4}+\frac{1}{12}dx^4(a+b\arcsin(cx))^2 + \frac{1}{6}dx^4(1-c^2x^2)(a+b\arcsin(cx))^2$$

```
[Out] -1/24*b^2*d*x^2/c^2-1/72*b^2*d*x^4+1/108*b^2*c^2*d*x^6-1/24*d*(a+b*arcsin(c
*x))^2/c^4+1/12*d*x^4*(a+b*arcsin(c*x))^2+1/6*d*x^4*(-c^2*x^2+1)*(a+b*arcsi
n(c*x))^2+1/12*b*d*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+1/18*b*d*x^3*
(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c-1/18*b*c*d*x^5*(a+b*arcsin(c*x))*(-c
^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4787, 4723, 4795, 4737, 30, 4783}

$$\int x^3 (d-c^2dx^2) (a+b\arcsin(cx))^2 \, dx = -\frac{d(a+b\arcsin(cx))^2}{24c^4} - \frac{1}{18}bcdx^5\sqrt{1-c^2x^2}(a+b\arcsin(cx)) + \frac{1}{6}dx^4(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{bdx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} + \frac{bdx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{12c^3} + \frac{1}{12}dx^4(a+b\arcsin(cx))^2 + \frac{1}{108}b^2c^2dx^6 - \frac{b^2dx^2}{24c^2} - \frac{1}{72}b^2dx^4$$

```
[In] Int[x^3*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/24*(b^2*d*x^2)/c^2 - (b^2*d*x^4)/72 + (b^2*c^2*d*x^6)/108 + (b*d*x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(12*c^3) + (b*d*x^3*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/(18*c) - (b*c*d*x^5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/18 - (d*(a + b*ArcSin[c*x])^2)/(24*c^4) + (d*x^4*(a + b*ArcSin[c*x])^2)/1
2 + (d*x^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/6
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{6}dx^4\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{1}{3}d\int x^3(a+b\arcsin(cx))^2\,dx \\
&\quad-\frac{1}{3}(bcd)\int x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx \\
&= -\frac{1}{18}bcdx^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))+\frac{1}{12}dx^4(a+b\arcsin(cx))^2 \\
&\quad+\frac{1}{6}dx^4\left(1-c^2x^2\right)(a+b\arcsin(cx))^2-\frac{1}{18}(bcd)\int\frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad-\frac{1}{6}(bcd)\int\frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx+\frac{1}{18}\left(b^2c^2d\right)\int x^5\,dx
\end{aligned}$$

$$= \frac{1}{108}b^2c^2dx^6 + \frac{bdx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} - \frac{1}{18}bcdx^5\sqrt{1-c^2x^2}(a + b\arcsin(cx)) + \frac{1}{12}dx^4(a+b\arcsin(cx))^2 + \frac{1}{6}dx^4(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{1}{72}(b^2d)\int x^3\,dx - \frac{1}{24}(b^2d)\int x^3\,dx - \frac{(bd)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{24c} - \frac{(bd)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{8c}$$

$$= -\frac{1}{72}b^2dx^4 + \frac{1}{108}b^2c^2dx^6 + \frac{bdx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{12c^3} + \frac{bdx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} - \frac{1}{18}bcdx^5\sqrt{1-c^2x^2}(a+b\arcsin(cx)) + \frac{1}{12}dx^4(a+b\arcsin(cx))^2 + \frac{1}{6}dx^4(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{(bd)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{48c^3} - \frac{(bd)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{16c^3} - \frac{(b^2d)\int x\,dx}{48c^2} - \frac{(b^2d)\int x\,dx}{16c^2}$$

$$= -\frac{b^2dx^2}{24c^2} - \frac{1}{72}b^2dx^4 + \frac{1}{108}b^2c^2dx^6 + \frac{bdx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{12c^3} + \frac{bdx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} - \frac{1}{18}bcdx^5\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{d(a+b\arcsin(cx))^2}{24c^4} + \frac{1}{12}dx^4(a+b\arcsin(cx))^2 + \frac{1}{6}dx^4(1-c^2x^2)(a+b\arcsin(cx))^2$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 192, normalized size of antiderivative = 0.95

$$\int x^3(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx = -\frac{d(b^2c^2x^2(9+3c^2x^2-2c^4x^4)+6abcx\sqrt{1-c^2x^2}(-3-2c^2x^2+2c^4x^4)+9a^2(1-6c^4x^4+4c^6x^6)+6b(bcx}{2}$$

```
[In] Integrate[x^3*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/216*(d*(b^2*c^2*x^2*(9 + 3*c^2*x^2 - 2*c^4*x^4) + 6*a*b*c*x*Sqrt[1 - c^2
*x^2]*(-3 - 2*c^2*x^2 + 2*c^4*x^4) + 9*a^2*(1 - 6*c^4*x^4 + 4*c^6*x^6) + 6*
b*(b*c*x*Sqrt[1 - c^2*x^2]*(-3 - 2*c^2*x^2 + 2*c^4*x^4) + 3*a*(1 - 6*c^4*x^
4 + 4*c^6*x^6))*ArcSin[c*x] + 9*b^2*(1 - 6*c^4*x^4 + 4*c^6*x^6)*ArcSin[c*x]
^2))/c^4
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 330, normalized size of antiderivative = 1.63

method	result
parts	$-d\,a^2\left(\frac{1}{6}c^2x^6-\frac{1}{4}x^4\right)-\frac{d\,b^2\left(-\frac{\arcsin(cx)^2x^4c^4}{4}+\frac{\arcsin(cx)\left(-2c^3x^3\sqrt{-c^2x^2+1}-3cx\sqrt{-c^2x^2+1}+3\arcsin(cx)\right)}{16}-\frac{\text{arcsi}}{}\right.}{}$
derivativedivides	$\frac{-d\,a^2\left(\frac{1}{6}c^6x^6-\frac{1}{4}c^4x^4\right)-d\,b^2\left(-\frac{\arcsin(cx)^2x^4c^4}{4}+\frac{\arcsin(cx)\left(-2c^3x^3\sqrt{-c^2x^2+1}-3cx\sqrt{-c^2x^2+1}+3\arcsin(cx)\right)}{16}-\frac{\arcsin(cx)^2}{24}+\right.}{}$
default	$\frac{-d\,a^2\left(\frac{1}{6}c^6x^6-\frac{1}{4}c^4x^4\right)-d\,b^2\left(-\frac{\arcsin(cx)^2x^4c^4}{4}+\frac{\arcsin(cx)\left(-2c^3x^3\sqrt{-c^2x^2+1}-3cx\sqrt{-c^2x^2+1}+3\arcsin(cx)\right)}{16}-\frac{\arcsin(cx)^2}{24}+\right.}{}$

```
[In] int(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -d*a^2*(1/6*c^2*x^6-1/4*x^4)-d*b^2/c^4*(-1/4*arcsin(c*x)^2*x^4*c^4+1/16*arc
sin(c*x)*(-2*c^3*x^3*(-c^2*x^2+1)^(1/2)-3*c*x*(-c^2*x^2+1)^(1/2)+3*arcsin(c
*x))-1/24*arcsin(c*x)^2+1/128*(2*c^2*x^2+3)^2+1/6*arcsin(c*x)^2*c^6*x^6-1/1
44*arcsin(c*x)*(-8*c^5*x^5*(-c^2*x^2+1)^(1/2)-10*c^3*x^3*(-c^2*x^2+1)^(1/2)
-15*c*x*(-c^2*x^2+1)^(1/2)+15*arcsin(c*x))-1/108*(c^2*x^2-1)^3-13/288*(c^2*
x^2-1)^2-11/96*c^2*x^2+11/96)-2*d*a*b/c^4*(1/6*arcsin(c*x)*c^6*x^6-1/4*c^4*
x^4*arcsin(c*x)+1/36*c^5*x^5*(-c^2*x^2+1)^(1/2)-1/36*c^3*x^3*(-c^2*x^2+1)^(
1/2)-1/24*c*x*(-c^2*x^2+1)^(1/2)+1/24*arcsin(c*x))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 211, normalized size of antiderivative = 1.04

$$\int x^3\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx =$$
$$-\frac{2\,(18\,a^2-b^2)c^6dx^6-3\,(18\,a^2-b^2)c^4dx^4+9\,b^2c^2dx^2+9\,(4\,b^2c^6dx^6-6\,b^2c^4dx^4+b^2d)\arcsin{(cx)}^2+18}{}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/216*(2*(18*a^2 - b^2)*c^6*d*x^6 - 3*(18*a^2 - b^2)*c^4*d*x^4 + 9*b^2*c^2
*d*x^2 + 9*(4*b^2*c^6*d*x^6 - 6*b^2*c^4*d*x^4 + b^2*d)*arcsin(c*x)^2 + 18*(
4*a*b*c^6*d*x^6 - 6*a*b*c^4*d*x^4 + a*b*d)*arcsin(c*x) + 6*(2*a*b*c^5*d*x^5
 - 2*a*b*c^3*d*x^3 - 3*a*b*c*d*x + (2*b^2*c^5*d*x^5 - 2*b^2*c^3*d*x^3 - 3*b
^2*c*d*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [A] (verification not implemented)

Time = 0.66 (sec) , antiderivative size = 332, normalized size of antiderivative = 1.64

$$\int x^3\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$=\begin{cases} -\frac{a^2c^2dx^6}{6}+\frac{a^2dx^4}{4}-\frac{abc^2dx^6\operatorname{asin}(cx)}{3}-\frac{abcdx^5\sqrt{-c^2x^2+1}}{18}+\frac{abdx^4\operatorname{asin}(cx)}{2}+\frac{abdx^3\sqrt{-c^2x^2+1}}{18c}+\frac{abdx\sqrt{-c^2x^2+1}}{12c^3}-\frac{abd\operatorname{asin}(c}{12c^4} \\ \frac{a^2dx^4}{4} \end{cases}$$

```
[In] integrate(x**3*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**6/6 + a**2*d*x**4/4 - a*b*c**2*d*x**6*asin(c*x)/
3 - a*b*c*d*x**5*sqrt(-c**2*x**2 + 1)/18 + a*b*d*x**4*asin(c*x)/2 + a*b*d*x
**3*sqrt(-c**2*x**2 + 1)/(18*c) + a*b*d*x*sqrt(-c**2*x**2 + 1)/(12*c**3) -
a*b*d*asin(c*x)/(12*c**4) - b**2*c**2*d*x**6*asin(c*x)**2/6 + b**2*c**2*d*x
**6/108 - b**2*c*d*x**5*sqrt(-c**2*x**2 + 1)*asin(c*x)/18 + b**2*d*x**4*asi
n(c*x)**2/4 - b**2*d*x**4/72 + b**2*d*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(
18*c) - b**2*d*x**2/(24*c**2) + b**2*d*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(12
*c**3) - b**2*d*asin(c*x)**2/(24*c**4), Ne(c, 0)), (a**2*d*x**4/4, True))
```

Maxima [F]

$$\int x^3\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx=\int -\left(c^2dx^2-d\right)(b\arcsin(cx)+a)^2x^3\,dx$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/6*a^2*c^2*d*x^6 + 1/4*a^2*d*x^4 - 1/144*(48*x^6*arcsin(c*x) + (8*sqrt(-c
^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)
*x/c^6 - 15*arcsin(c*x)/c^7)*c)*a*b*c^2*d + 1/16*(8*x^4*arcsin(c*x) + (2*sq
rt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*
c)*a*b*d - 1/12*(2*b^2*c^2*d*x^6 - 3*b^2*d*x^4)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))^2 - integrate(1/6*(2*b^2*c^3*d*x^6 - 3*b^2*c*d*x^4)*sqrt(c*
x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 -
 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 377 vs. $2(177) = 354$.

Time = 0.33 (sec) , antiderivative size = 377, normalized size of antiderivative = 1.87

$$\int x^3(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx = -\frac{1}{6}a^2c^2dx^6 + \frac{1}{4}a^2dx^4 - \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}b^2dx\arcsin(cx)}{18c^3} - \frac{(c^2x^2-1)^3b^2d\arcsin(cx)^2}{6c^4} - \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}abdx}{18c^3} + \frac{(-c^2x^2+1)^{\frac{3}{2}}b^2dx\arcsin(cx)}{18c^3} - \frac{(c^2x^2-1)^3abd\arcsin(cx)}{3c^4} - \frac{(c^2x^2-1)^2b^2d\arcsin(cx)^2}{4c^4} + \frac{(-c^2x^2+1)^{\frac{3}{2}}abdx}{18c^3} + \frac{\sqrt{-c^2x^2+1}b^2dx\arcsin(cx)}{12c^3} + \frac{(c^2x^2-1)^3b^2d}{108c^4} - \frac{(c^2x^2-1)^2abd\arcsin(cx)}{2c^4} + \frac{\sqrt{-c^2x^2+1}abdx}{12c^3} + \frac{(c^2x^2-1)^2b^2d}{72c^4} + \frac{b^2d\arcsin(cx)^2}{24c^4} - \frac{(c^2x^2-1)b^2d}{24c^4} + \frac{abd\arcsin(cx)}{12c^4} - \frac{5b^2d}{216c^4}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/6*a^2*c^2*d*x^6 + 1/4*a^2*d*x^4 - 1/18*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1
)*b^2*d*x*arcsin(c*x)/c^3 - 1/6*(c^2*x^2 - 1)^3*b^2*d*arcsin(c*x)^2/c^4 - 1
/18*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d*x/c^3 + 1/18*(-c^2*x^2 + 1)^(3
/2)*b^2*d*x*arcsin(c*x)/c^3 - 1/3*(c^2*x^2 - 1)^3*a*b*d*arcsin(c*x)/c^4 - 1
/4*(c^2*x^2 - 1)^2*b^2*d*arcsin(c*x)^2/c^4 + 1/18*(-c^2*x^2 + 1)^(3/2)*a*b*
d*x/c^3 + 1/12*sqrt(-c^2*x^2 + 1)*b^2*d*x*arcsin(c*x)/c^3 + 1/108*(c^2*x^2
- 1)^3*b^2*d/c^4 - 1/2*(c^2*x^2 - 1)^2*a*b*d*arcsin(c*x)/c^4 + 1/12*sqrt(-c
^2*x^2 + 1)*a*b*d*x/c^3 + 1/72*(c^2*x^2 - 1)^2*b^2*d/c^4 + 1/24*b^2*d*arcsi
n(c*x)^2/c^4 - 1/24*(c^2*x^2 - 1)*b^2*d/c^4 + 1/12*a*b*d*arcsin(c*x)/c^4 -
5/216*b^2*d/c^4
```

Mupad [F(-1)]

Timed out.

$$\int x^3(d - c^2dx^2)(a + b\arcsin(cx))^2\,dx = \int x^3\,(a + b\,\mathrm{asin}(c\,x))^2\,\left(d - c^2\,d\,x^2\right)\,dx$$

```
[In] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2),x)
[Out] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2), x)
```

3.158 $\int x^2(d-c^2dx^2)\,(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 25, antiderivative size = 211

$$\begin{aligned}\int x^2\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx=&-\frac{52b^2dx}{225c^2}-\frac{26}{675}b^2dx^3+\frac{2}{125}b^2c^2dx^5\\&+\frac{8bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c^3}\\&+\frac{4bdx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c}\\&+\frac{2bd(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{15c^3}\\&-\frac{2bd(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}{25c^3}\\&+\frac{2}{15}dx^3(a+b\arcsin(cx))^2\\&+\frac{1}{5}dx^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2\end{aligned}$$

```
[Out] -52/225*b^2*d*x/c^2-26/675*b^2*d*x^3+2/125*b^2*c^2*d*x^5+2/15*b*d*(-c^2*x^2
+1)^(3/2)*(a+b*arcsin(c*x))/c^3-2/25*b*d*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x
))/c^3+2/15*d*x^3*(a+b*arcsin(c*x))^2+1/5*d*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*
x))^2+8/45*b*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+4/45*b*d*x^2*(a+b*a
rcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 211, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4787, 4723, 4795, 4767, 8, 30, 272, 45, 4779, 12}

$$\int x^2(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx = \frac{4bdx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c} + \frac{1}{5}dx^3(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{2bd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{25c^3} + \frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{15c^3} + \frac{8bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c^3} + \frac{2}{15}dx^3(a+b\arcsin(cx))^2 + \frac{2}{125}b^2c^2dx^5 - \frac{52b^2dx}{225c^2} - \frac{26}{675}b^2dx^3$$

```
[In] Int[x^2*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-52*b^2*d*x)/(225*c^2) - (26*b^2*d*x^3)/675 + (2*b^2*c^2*d*x^5)/125 + (8*b
*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(45*c^3) + (4*b*d*x^2*Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x]))/(45*c) + (2*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcS
in[c*x]))/(15*c^3) - (2*b*d*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(25*c^
3) + (2*d*x^3*(a + b*ArcSin[c*x])^2)/15 + (d*x^3*(1 - c^2*x^2)*(a + b*ArcSi
n[c*x])^2)/5
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{5}dx^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{1}{5}(2d)\int x^2(a+b\arcsin(cx))^2\,dx \\
&\quad -\frac{1}{5}(2bcd)\int x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx \\
&= \frac{2bd\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))}{15c^3}-\frac{2bd\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{25c^3} \\
&\quad +\frac{2}{15}dx^3(a+b\arcsin(cx))^2+\frac{1}{5}dx^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad -\frac{1}{15}(4bcd)\int\frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx+\frac{1}{5}\left(2b^2c^2d\right)\int\frac{-2-c^2x^2+3c^4x^4}{15c^4}\,dx \\
&= \frac{4bdx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c}+\frac{2bd\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))}{15c^3} \\
&\quad -\frac{2bd\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{25c^3} \\
&\quad +\frac{2}{15}dx^3(a+b\arcsin(cx))^2+\frac{1}{5}dx^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad -\frac{1}{45}\left(4b^2d\right)\int x^2\,dx+\frac{\left(2b^2d\right)\int\left(-2-c^2x^2+3c^4x^4\right)\,dx}{75c^2}-\frac{(8bd)\int\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{45c} \\
&= -\frac{4b^2dx}{75c^2}-\frac{26}{675}b^2dx^3+\frac{2}{125}b^2c^2dx^5+\frac{8bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c^3} \\
&\quad +\frac{4bdx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c}+\frac{2bd\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))}{15c^3} \\
&\quad -\frac{2bd\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{25c^3} \\
&\quad +\frac{2}{15}dx^3(a+b\arcsin(cx))^2+\frac{1}{5}dx^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2-\frac{\left(8b^2d\right)\int 1\,dx}{45c^2}
\end{aligned}$$

$$= -\frac{52b^2dx}{225c^2} - \frac{26}{675}b^2dx^3 + \frac{2}{125}b^2c^2dx^5 + \frac{8bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c^3}$$
$$+ \frac{4bdx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c} + \frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{15c^3}$$
$$- \frac{2bd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{25c^3}$$
$$+ \frac{2}{15}dx^3(a+b\arcsin(cx))^2 + \frac{1}{5}dx^3(1-c^2x^2)(a+b\arcsin(cx))^2$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 179, normalized size of antiderivative = 0.85

$$\int x^2(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx =$$
$$-\frac{d\left(225a^2c^3x^3(-5+3c^2x^2)+30ab\sqrt{1-c^2x^2}(-26-13c^2x^2+9c^4x^4)+b^2(780cx+130c^3x^3-54c^5x^5)+\right.}{}$$

```
[In] Integrate[x^2*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/3375*(d*(225*a^2*c^3*x^3*(-5 + 3*c^2*x^2) + 30*a*b*Sqrt[1 - c^2*x^2]*(-2
6 - 13*c^2*x^2 + 9*c^4*x^4) + b^2*(780*c*x + 130*c^3*x^3 - 54*c^5*x^5) + 30
*b*(15*a*c^3*x^3*(-5 + 3*c^2*x^2) + b*Sqrt[1 - c^2*x^2]*(-26 - 13*c^2*x^2 +
 9*c^4*x^4))*ArcSin[c*x] + 225*b^2*c^3*x^3*(-5 + 3*c^2*x^2)*ArcSin[c*x]^2))
/c^3
```

Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 279, normalized size of antiderivative = 1.32

method	result
parts	$-d\,a^2\left(\frac{1}{5}c^2x^5-\frac{1}{3}x^3\right)-\frac{d\,b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-3\right)cx}{3}+\frac{4cx}{15}-\frac{4\arcsin(cx)\sqrt{-c^2x^2+1}}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)\sqrt{-c^2x^2+1}}{45}\right.}{}$
derivativedivides	$\frac{-d\,a^2\left(\frac{1}{5}c^5x^5-\frac{1}{3}c^3x^3\right)-d\,b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-3\right)cx}{3}+\frac{4cx}{15}-\frac{4\arcsin(cx)\sqrt{-c^2x^2+1}}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)\sqrt{-c^2x^2+1}}{45}-\frac{2(c}{}\right.}{}$
default	$\frac{-d\,a^2\left(\frac{1}{5}c^5x^5-\frac{1}{3}c^3x^3\right)-d\,b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-3\right)cx}{3}+\frac{4cx}{15}-\frac{4\arcsin(cx)\sqrt{-c^2x^2+1}}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)\sqrt{-c^2x^2+1}}{45}-\frac{2(c}{}\right.}{}$

```
[In] int(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -d*a^2*(1/5*c^2*x^5-1/3*x^3)-d*b^2/c^3*(1/3*arcsin(c*x)^2*(c^2*x^2-3)*c*x+4
/15*c*x-4/15*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+2/45*arcsin(c*x)*(c^2*x^2-1)*(-
c^2*x^2+1)^(1/2)-2/135*(c^2*x^2-3)*c*x+1/15*arcsin(c*x)^2*(3*c^4*x^4-10*c^2
```

```
*x^2+15)*c*x+2/25*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)-2/375*(3*c^4
*x^4-10*c^2*x^2+15)*c*x)-2*d*a*b/c^3*(1/5*arcsin(c*x)*c^5*x^5-1/3*c^3*x^3*a
rcsin(c*x)+1/25*c^4*x^4*(-c^2*x^2+1)^(1/2)-13/225*c^2*x^2*(-c^2*x^2+1)^(1/2
)-26/225*(-c^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 194, normalized size of antiderivative = 0.92

$$\int x^2\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx =$$
$$-\frac{27\,(25\,a^2-2\,b^2)c^5dx^5-5\,(225\,a^2-26\,b^2)c^3dx^3+780\,b^2cdx+225\,(3\,b^2c^5dx^5-5\,b^2c^3dx^3)\arcsin{(cx)}^2+}{}$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/3375*(27*(25*a^2 - 2*b^2)*c^5*d*x^5 - 5*(225*a^2 - 26*b^2)*c^3*d*x^3 + 7
80*b^2*c*d*x + 225*(3*b^2*c^5*d*x^5 - 5*b^2*c^3*d*x^3)*arcsin(c*x)^2 + 450*
(3*a*b*c^5*d*x^5 - 5*a*b*c^3*d*x^3)*arcsin(c*x) + 30*(9*a*b*c^4*d*x^4 - 13*
a*b*c^2*d*x^2 - 26*a*b*d + (9*b^2*c^4*d*x^4 - 13*b^2*c^2*d*x^2 - 26*b^2*d)*
arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A] (verification not implemented)

Time = 0.49 (sec) , antiderivative size = 313, normalized size of antiderivative = 1.48

$$\int x^2\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$=\begin{cases} -\frac{a^2c^2dx^5}{5}+\frac{a^2dx^3}{3}-\frac{2abc^2dx^5\operatorname{asin}{(cx)}}{5}-\frac{2abcdx^4\sqrt{-c^2x^2+1}}{25}+\frac{2abdx^3\operatorname{asin}{(cx)}}{3}+\frac{26abdx^2\sqrt{-c^2x^2+1}}{225c}+\frac{52abd\sqrt{-c^2x^2+1}}{225c^3}-\frac{b^2c}{} \\ \frac{a^2dx^3}{3} \end{cases}$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**5/5 + a**2*d*x**3/3 - 2*a*b*c**2*d*x**5*asin(c*x
)/5 - 2*a*b*c*d*x**4*sqrt(-c**2*x**2 + 1)/25 + 2*a*b*d*x**3*asin(c*x)/3 + 2
6*a*b*d*x**2*sqrt(-c**2*x**2 + 1)/(225*c) + 52*a*b*d*sqrt(-c**2*x**2 + 1)/(
225*c**3) - b**2*c**2*d*x**5*asin(c*x)**2/5 + 2*b**2*c**2*d*x**5/125 - 2*b*
*2*c*d*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/25 + b**2*d*x**3*asin(c*x)**2/3
- 26*b**2*d*x**3/675 + 26*b**2*d*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(225*c
) - 52*b**2*d*x/(225*c**2) + 52*b**2*d*sqrt(-c**2*x**2 + 1)*asin(c*x)/(225*
c**3), Ne(c, 0)), (a**2*d*x**3/3, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 354, normalized size of antiderivative = 1.68

$$\int x^2\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$=-\frac{1}{5}\,b^2c^2dx^5\arcsin\left(cx\right)^2-\frac{1}{5}\,a^2c^2dx^5+\frac{1}{3}\,b^2dx^3\arcsin\left(cx\right)^2$$
$$-\frac{2}{75}\left(15\,x^5\arcsin\left(cx\right)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abc^2d$$
$$-\frac{2}{1125}\left(15\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\arcsin\left(cx\right)-\frac{9\,c^4x^5+20\,c^2x^3+12}{c^4}\right.$$
$$+\frac{1}{3}\,a^2dx^3+\frac{2}{9}\left(3\,x^3\arcsin\left(cx\right)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abd$$
$$+\frac{2}{27}\left(3\,c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\arcsin\left(cx\right)-\frac{c^2x^3+6\,x}{c^2}\right)b^2d$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/5*b^2*c^2*d*x^5*arcsin(c*x)^2 - 1/5*a^2*c^2*d*x^5 + 1/3*b^2*d*x^3*arcsin
(c*x)^2 - 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt
(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^2*d - 2/1125*(1
5*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^
2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*c
^2*d + 1/3*a^2*d*x^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c
^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d + 2/27*(3*c*(sqrt(-c^2*x^2 + 1)*x^2/c
^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*b^2*d
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 356, normalized size of antiderivative = 1.69

$$\int x^2(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx = -\frac{1}{5}a^2c^2dx^5+\frac{1}{3}a^2dx^3-\frac{(c^2x^2-1)^2b^2dx\arcsin(cx)^2}{5c^2} - \frac{2(c^2x^2-1)^2abdx\arcsin(cx)}{5c^2} - \frac{(c^2x^2-1)b^2dx\arcsin(cx)^2}{15c^2} + \frac{2(c^2x^2-1)^2b^2dx}{125c^2} - \frac{2(c^2x^2-1)abdx\arcsin(cx)}{15c^2} + \frac{2b^2dx\arcsin(cx)^2}{15c^2} - \frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}b^2d\arcsin(cx)}{25c^3} - \frac{22(c^2x^2-1)b^2dx}{3375c^2} + \frac{4abdx\arcsin(cx)}{15c^2} - \frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}abd}{25c^3} + \frac{2(-c^2x^2+1)^{\frac{3}{2}}b^2d\arcsin(cx)}{45c^3} - \frac{856b^2dx}{3375c^2} + \frac{2(-c^2x^2+1)^{\frac{3}{2}}abd}{45c^3} + \frac{4\sqrt{-c^2x^2+1}b^2d\arcsin(cx)}{15c^3} + \frac{4\sqrt{-c^2x^2+1}abd}{15c^3}$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/5*a^2*c^2*d*x^5 + 1/3*a^2*d*x^3 - 1/5*(c^2*x^2 - 1)^2*b^2*d*x*arcsin(c*x
)^2/c^2 - 2/5*(c^2*x^2 - 1)^2*a*b*d*x*arcsin(c*x)/c^2 - 1/15*(c^2*x^2 - 1)*
b^2*d*x*arcsin(c*x)^2/c^2 + 2/125*(c^2*x^2 - 1)^2*b^2*d*x/c^2 - 2/15*(c^2*x
^2 - 1)*a*b*d*x*arcsin(c*x)/c^2 + 2/15*b^2*d*x*arcsin(c*x)^2/c^2 - 2/25*(c^
2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d*arcsin(c*x)/c^3 - 22/3375*(c^2*x^2 -
1)*b^2*d*x/c^2 + 4/15*a*b*d*x*arcsin(c*x)/c^2 - 2/25*(c^2*x^2 - 1)^2*sqrt(-
c^2*x^2 + 1)*a*b*d/c^3 + 2/45*(-c^2*x^2 + 1)^(3/2)*b^2*d*arcsin(c*x)/c^3 -
856/3375*b^2*d*x/c^2 + 2/45*(-c^2*x^2 + 1)^(3/2)*a*b*d/c^3 + 4/15*sqrt(-c^2
*x^2 + 1)*b^2*d*arcsin(c*x)/c^3 + 4/15*sqrt(-c^2*x^2 + 1)*a*b*d/c^3
```

Mupad [F(-1)]

Timed out.

$$\int x^2(d-c^2dx^2)\,(a+b\arcsin(cx))^2\,dx=\int x^2\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)\,dx$$

```
[In] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2),x)
[Out] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2), x)
```

3.159 $\int x(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 23, antiderivative size = 138

$$\int x(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx = -\frac{5}{32}b^2dx^2+\frac{1}{32}b^2c^2dx^4 + \frac{3bdx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c} + \frac{bdx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{8c} + \frac{3d(a+b\arcsin(cx))^2}{32c^2} - \frac{d(1-c^2x^2)^2(a+b\arcsin(cx))^2}{4c^2}$$

```
[Out] -5/32*b^2*d*x^2+1/32*b^2*c^2*d*x^4+1/8*b*d*x*(-c^2*x^2+1)^(3/2)*(a+b*arcsin
(c*x))/c+3/32*d*(a+b*arcsin(c*x))^2/c^2-1/4*d*(-c^2*x^2+1)^2*(a+b*arcsin(c*
x))^2/c^2+3/16*b*d*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used

$= \{4767, 4743, 4741, 4737, 30, 14\}$

$$\int x(d-c^2dx^2)\,(a+b\arcsin(cx))^2\,dx = \frac{bdx(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{8c} + \frac{3bdx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c} - \frac{d(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{4c^2} + \frac{3d(a+b\arcsin(cx))^2}{32c^2} + \frac{1}{32}b^2c^2dx^4 - \frac{5}{32}b^2dx^2$$

```
[In] Int[x*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-5*b^2*d*x^2)/32 + (b^2*c^2*d*x^4)/32 + (3*b*d*x*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/(16*c) + (b*d*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(8*c
) + (3*d*(a + b*ArcSin[c*x])^2)/(32*c^2) - (d*(1 - c^2*x^2)^2*(a + b*ArcSin
[c*x])^2)/(4*c^2)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{4c^2}+\frac{(bd)\int(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\,dx}{2c}\\
&= \frac{bdx(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{8c}-\frac{d(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{4c^2}\\
&\quad -\frac{1}{8}\left(b^2d\right)\int x\left(1-c^2x^2\right)\,dx+\frac{(3bd)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{8c}\\
&= \frac{3bdx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c}+\frac{bdx(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{8c}\\
&\quad -\frac{d(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{4c^2}\\
&\quad -\frac{1}{8}\left(b^2d\right)\int\left(x-c^2x^3\right)\,dx-\frac{1}{16}\left(3b^2d\right)\int x\,dx+\frac{(3bd)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{16c}\\
&= -\frac{5}{32}b^2dx^2+\frac{1}{32}b^2c^2dx^4+\frac{3bdx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c}\\
&\quad +\frac{bdx(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{8c}\\
&\quad +\frac{3d(a+b\arcsin(cx))^2}{32c^2}-\frac{d(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{4c^2}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 165, normalized size of antiderivative = 1.20

$$\int x(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx =$$
$$-\frac{d\left(b^2c^2x^2(5-c^2x^2)+2abcx\sqrt{1-c^2x^2}(-5+2c^2x^2)+a^2(5-16c^2x^2+8c^4x^4)+2b\left(bcx\sqrt{1-c^2x^2}(-5+\right.\right.}{32c^2}$$

```
[In] Integrate[x*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/32*(d*(b^2*c^2*x^2*(5 - c^2*x^2) + 2*a*b*c*x*Sqrt[1 - c^2*x^2]*(-5 + 2*c
^2*x^2) + a^2*(5 - 16*c^2*x^2 + 8*c^4*x^4) + 2*b*(b*c*x*Sqrt[1 - c^2*x^2]*(
-5 + 2*c^2*x^2) + a*(5 - 16*c^2*x^2 + 8*c^4*x^4))*ArcSin[c*x] + b^2*(5 - 16
*c^2*x^2 + 8*c^4*x^4)*ArcSin[c*x]^2))/c^2
```

Maple [A] (verified)

Time = 0.22 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.39

method	result
derivativedivides	$\frac{-\frac{d a^2\left(c^2x^2-1\right)^2}{4}-d b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^2}{4}-\frac{\arcsin(cx)\left(-2c^3x^3\sqrt{-c^2x^2+1}+5cx\sqrt{-c^2x^2+1}+3\arcsin(cx)\right)}{16}+\frac{3\arcsin(cx)^2}{32}-\right.}{c^2}$
default	$\frac{-\frac{d a^2\left(c^2x^2-1\right)^2}{4}-d b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^2}{4}-\frac{\arcsin(cx)\left(-2c^3x^3\sqrt{-c^2x^2+1}+5cx\sqrt{-c^2x^2+1}+3\arcsin(cx)\right)}{16}+\frac{3\arcsin(cx)^2}{32}-\right.}{c^2}$
parts	$-\frac{d a^2\left(c^2x^2-1\right)^2}{4c^2}-\frac{d b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^2}{4}-\frac{\arcsin(cx)\left(-2c^3x^3\sqrt{-c^2x^2+1}+5cx\sqrt{-c^2x^2+1}+3\arcsin(cx)\right)}{16}+\frac{3\arcsin(cx}{32}\right.}{c^2}$

```
[In] int(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(-1/4*d*a^2*(c^2*x^2-1)^2-d*b^2*(1/4*arcsin(c*x)^2*(c^2*x^2-1)^2-1/16
*arcsin(c*x)*(-2*c^3*x^3*(-c^2*x^2+1)^(1/2)+5*c*x*(-c^2*x^2+1)^(1/2)+3*arcs
in(c*x))+3/32*arcsin(c*x)^2-1/128*(2*c^2*x^2-5)^2)-2*d*a*b*(1/4*c^4*x^4*arc
sin(c*x)-1/2*c^2*x^2*arcsin(c*x)+5/32*arcsin(c*x)+1/16*c^3*x^3*(-c^2*x^2+1)
^(1/2)-5/32*c*x*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.28

$$\int x(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx =$$
$$-\frac{(8\,a^2-b^2)c^4dx^4-(16\,a^2-5\,b^2)c^2dx^2+(8\,b^2c^4dx^4-16\,b^2c^2dx^2+5\,b^2d)\arcsin(cx)^2+2\,(8\,abc^4dx^4-16}{32\,c}$$

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/32*((8*a^2 - b^2)*c^4*d*x^4 - (16*a^2 - 5*b^2)*c^2*d*x^2 + (8*b^2*c^4*d*
x^4 - 16*b^2*c^2*d*x^2 + 5*b^2*d)*arcsin(c*x)^2 + 2*(8*a*b*c^4*d*x^4 - 16*a
*b*c^2*d*x^2 + 5*a*b*d)*arcsin(c*x) + 2*(2*a*b*c^3*d*x^3 - 5*a*b*c*d*x + (2
*b^2*c^3*d*x^3 - 5*b^2*c*d*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 269 vs. 2(129) = 258.

Time = 0.40 (sec) , antiderivative size = 269, normalized size of antiderivative = 1.95

$$\int x(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx$$
$$=\begin{cases}-\frac{a^2c^2dx^4}{4}+\frac{a^2dx^2}{2}-\frac{abc^2dx^4\operatorname{asin}(cx)}{2}-\frac{abcdx^3\sqrt{-c^2x^2+1}}{8}+abdx^2\operatorname{asin}(cx)+\frac{5abdx\sqrt{-c^2x^2+1}}{16c}-\frac{5abd\operatorname{asin}(cx)}{16c^2}-\frac{b^2c^2dx^4}{} \\ \frac{a^2dx^2}{2}\end{cases}$$

```
[In] integrate(x*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**4/4 + a**2*d*x**2/2 - a*b*c**2*d*x**4*asin(c*x)/
2 - a*b*c*d*x**3*sqrt(-c**2*x**2 + 1)/8 + a*b*d*x**2*asin(c*x) + 5*a*b*d*x*
sqrt(-c**2*x**2 + 1)/(16*c) - 5*a*b*d*asin(c*x)/(16*c**2) - b**2*c**2*d*x**
4*asin(c*x)**2/4 + b**2*c**2*d*x**4/32 - b**2*c*d*x**3*sqrt(-c**2*x**2 + 1)
*asin(c*x)/8 + b**2*d*x**2*asin(c*x)**2/2 - 5*b**2*d*x**2/32 + 5*b**2*d*x*s
qrt(-c**2*x**2 + 1)*asin(c*x)/(16*c) - 5*b**2*d*asin(c*x)**2/(32*c**2), Ne(
c, 0)), (a**2*d*x**2/2, True))
```

Maxima [F]

$$\int x(d - c^2dx^2) (a + b \arcsin(cx))^2 \, dx = \int -\left(c^2dx^2 - d\right)\left(b \arcsin\left(cx\right) + a\right)^2 x \, dx$$

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*c^2*d*x^4 - 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^
2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*c^2*d + 1/2*a^2*
d*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/
c^3))*a*b*d - 1/4*(b^2*c^2*d*x^4 - 2*b^2*d*x^2)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))^2 - integrate(1/2*(b^2*c^3*d*x^4 - 2*b^2*c*d*x^2)*sqrt(c*x
+ 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1
), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 248 vs. $2(121) = 242$.

Time = 0.33 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.80

$$\begin{aligned}\int x(d - c^2dx^2) (a + b \arcsin(cx))^2 \, dx = & -\frac{1}{4} a^2c^2dx^4 + \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}} b^2dx \arcsin\left(cx\right)}{8\,c} \\ & - \frac{\left(c^2x^2-1\right)^2 b^2d \arcsin\left(cx\right)^2}{4\,c^2} + \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}} abdx}{8\,c} \\ & + \frac{3\,\sqrt{-c^2x^2+1} b^2dx \arcsin\left(cx\right)}{16\,c} \\ & - \frac{\left(c^2x^2-1\right)^2 abd \arcsin\left(cx\right)}{2\,c^2} \\ & + \frac{3\,\sqrt{-c^2x^2+1} abdx}{16\,c} + \frac{\left(c^2x^2-1\right)^2 b^2d}{32\,c^2} \\ & + \frac{3\,b^2d \arcsin\left(cx\right)^2}{32\,c^2} + \frac{(c^2x^2-1)a^2d}{2\,c^2} \\ & - \frac{3\,(c^2x^2-1)b^2d}{32\,c^2} + \frac{3\,abd \arcsin\left(cx\right)}{16\,c^2} - \frac{15\,b^2d}{256\,c^2}\end{aligned}$$

```
[In] integrate(x*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/4*a^2*c^2*d*x^4 + 1/8*(-c^2*x^2 + 1)^(3/2)*b^2*d*x*arcsin(c*x)/c - 1/4*(
c^2*x^2 - 1)^2*b^2*d*arcsin(c*x)^2/c^2 + 1/8*(-c^2*x^2 + 1)^(3/2)*a*b*d*x/c
 + 3/16*sqrt(-c^2*x^2 + 1)*b^2*d*x*arcsin(c*x)/c - 1/2*(c^2*x^2 - 1)^2*a*b*
d*arcsin(c*x)/c^2 + 3/16*sqrt(-c^2*x^2 + 1)*a*b*d*x/c + 1/32*(c^2*x^2 - 1)^
2*b^2*d/c^2 + 3/32*b^2*d*arcsin(c*x)^2/c^2 + 1/2*(c^2*x^2 - 1)*a^2*d/c^2 -
3/32*(c^2*x^2 - 1)*b^2*d/c^2 + 3/16*a*b*d*arcsin(c*x)/c^2 - 15/256*b^2*d/c^
2
```

Mupad [F(-1)]

Timed out.

$$\int x(d-c^2dx^2)\,(a+b\arcsin(cx))^2\,dx=\int x\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)\,dx$$

```
[In] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2),x)
[Out] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2), x)
```

3.160 $\int (d-c^2dx^2) (a+b\arcsin(cx))^2 dx$

Optimal result

Integrand size = 22, antiderivative size = 128

$$\int (d-c^2dx^2) (a+b\arcsin(cx))^2 dx = -\frac{14}{9}b^2dx+\frac{2}{27}b^2c^2dx^3 + \frac{4bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c} + \frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{9c} + \frac{2}{3}dx(a+b\arcsin(cx))^2 + \frac{1}{3}dx(1-c^2x^2)(a+b\arcsin(cx))^2$$

```
[Out] -14/9*b^2*d*x+2/27*b^2*c^2*d*x^3+2/9*b*d*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x
))/c+2/3*d*x*(a+b*arcsin(c*x))^2+1/3*d*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+4
/3*b*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4743, 4715, 4767, 8}

$$\int (d-c^2dx^2) (a+b\arcsin(cx))^2 dx = \frac{1}{3}dx(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{9c} + \frac{4bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c} + \frac{2}{3}dx(a+b\arcsin(cx))^2+\frac{2}{27}b^2c^2dx^3-\frac{14}{9}b^2dx$$

```
[In] Int[(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-14*b^2*d*x)/9 + (2*b^2*c^2*d*x^3)/27 + (4*b*d*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x]))/(3*c) + (2*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(9*c) +
 (2*d*x*(a + b*ArcSin[c*x])^2)/3 + (d*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2
)/3
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{3}dx\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{1}{3}(2d)\int(a+b\arcsin(cx))^2\,dx \\
&\quad -\frac{1}{3}(2bcd)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx \\
&= \frac{2bd\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))}{9c} \\
&\quad +\frac{2}{3}dx(a+b\arcsin(cx))^2+\frac{1}{3}dx\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad -\frac{1}{9}\left(2b^2d\right)\int\left(1-c^2x^2\right)\,dx-\frac{1}{3}(4bcd)\int\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx
\end{aligned}
$$

$$= -\frac{2}{9}b^2dx + \frac{2}{27}b^2c^2dx^3 + \frac{4bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c} + \frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{9c} + \frac{2}{3}dx(a+b\arcsin(cx))^2 + \frac{1}{3}dx(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{1}{3}(4b^2d)\int 1\,dx$$

$$= -\frac{14}{9}b^2dx + \frac{2}{27}b^2c^2dx^3 + \frac{4bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c} + \frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{9c} + \frac{2}{3}dx(a+b\arcsin(cx))^2 + \frac{1}{3}dx(1-c^2x^2)(a+b\arcsin(cx))^2$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.07

$$\int (d-c^2dx^2)(a+b\arcsin(cx))^2\,dx = -\frac{d\left(-2b^2cx(-21+c^2x^2)+6ab\sqrt{1-c^2x^2}(-7+c^2x^2)+9a^2cx(-3+c^2x^2)+6b\left(b\sqrt{1-c^2x^2}(-7+c^2x^2)\right.\right.}{27c}$$

```
[In] Integrate[(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/27*(d*(-2*b^2*c*x*(-21 + c^2*x^2) + 6*a*b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^
2) + 9*a^2*c*x*(-3 + c^2*x^2) + 6*b*(b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^2) + 3
*a*c*x*(-3 + c^2*x^2))*ArcSin[c*x] + 9*b^2*c*x*(-3 + c^2*x^2)*ArcSin[c*x]^2
))/c
```

Maple [A] (verified)

Time = 0.06 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.35

method	result
derivativedivides	$\frac{-d\,a^2\left(\frac{1}{3}c^3x^3-cx\right)-d\,b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-3\right)cx}{3}+\frac{4cx}{3}-\frac{4\arcsin(cx)\sqrt{-c^2x^2+1}}{3}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)\sqrt{-c^2x^2+1}}{9}-\frac{2\left(c^2x^2\right.}{27}\right.}{c}$
default	$\frac{-d\,a^2\left(\frac{1}{3}c^3x^3-cx\right)-d\,b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-3\right)cx}{3}+\frac{4cx}{3}-\frac{4\arcsin(cx)\sqrt{-c^2x^2+1}}{3}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)\sqrt{-c^2x^2+1}}{9}-\frac{2\left(c^2x^2\right.}{27}\right.}{c}$
parts	$-d\,a^2\left(\frac{1}{3}c^2x^3-x\right)-\frac{d\,b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-3\right)cx}{3}+\frac{4cx}{3}-\frac{4\arcsin(cx)\sqrt{-c^2x^2+1}}{3}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)\sqrt{-c^2x^2+1}}{9}-\right.}{c}$

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-d*a^2*(1/3*c^3*x^3-c*x)-d*b^2*(1/3*arcsin(c*x)^2*(c^2*x^2-3)*c*x+4/3*
c*x-4/3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+2/9*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^
```

```
2+1)^(1/2)-2/27*(c^2*x^2-3)*c*x)-2*d*a*b*(1/3*c^3*x^3*arcsin(c*x)-c*x*arcsi
n(c*x)+1/9*c^2*x^2*(-c^2*x^2+1)^(1/2)-7/9*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.14

$$\int \left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx = -\frac{(9\,a^2-2\,b^2)c^3dx^3-3\,(9\,a^2-14\,b^2)cdx+9\,(b^2c^3dx^3-3\,b^2cdx)\arcsin{(cx)}^2+18\,(abc^3dx^3-3\,abcdx)\,\mathrm{arc}}{27\,c}$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/27*((9*a^2 - 2*b^2)*c^3*d*x^3 - 3*(9*a^2 - 14*b^2)*c*d*x + 9*(b^2*c^3*d*
x^3 - 3*b^2*c*d*x)*arcsin(c*x)^2 + 18*(a*b*c^3*d*x^3 - 3*a*b*c*d*x)*arcsin(
c*x) + 6*(a*b*c^2*d*x^2 - 7*a*b*d + (b^2*c^2*d*x^2 - 7*b^2*d)*arcsin(c*x))*
sqrt(-c^2*x^2 + 1))/c
```

Sympy [A] (verification not implemented)

Time = 0.20 (sec) , antiderivative size = 224, normalized size of antiderivative = 1.75

$$\int \left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx = \begin{cases} -\frac{a^2c^2dx^3}{3}+a^2dx-\frac{2abc^2dx^3\operatorname{asin}{(cx)}}{3}-\frac{2abcdx^2\sqrt{-c^2x^2+1}}{9}+2abdx\operatorname{asin}{(cx)}+\frac{14abd\sqrt{-c^2x^2+1}}{9c}-\frac{b^2c^2dx^3\operatorname{asin}^2{(cx)}}{3}+ \\ a^2dx \end{cases}$$

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**2*d*x**3/3 + a**2*d*x - 2*a*b*c**2*d*x**3*asin(c*x)/3 -
 2*a*b*c*d*x**2*sqrt(-c**2*x**2 + 1)/9 + 2*a*b*d*x*asin(c*x) + 14*a*b*d*sqr
t(-c**2*x**2 + 1)/(9*c) - b**2*c**2*d*x**3*asin(c*x)**2/3 + 2*b**2*c**2*d*x
**3/27 - 2*b**2*c*d*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/9 + b**2*d*x*asin(c
*x)**2 - 14*b**2*d*x/9 + 14*b**2*d*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c), Ne
(c, 0)), (a**2*d*x, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 233 vs. $2(111) = 222$.

Time = 0.28 (sec) , antiderivative size = 233, normalized size of antiderivative = 1.82

$$\int (d - c^2dx^2)(a + b\arcsin(cx))^2\,dx$$
$$= -\frac{1}{3}b^2c^2dx^3\arcsin(cx)^2 - \frac{1}{3}a^2c^2dx^3 - \frac{2}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abc^2d - \frac{2}{27}\left(3c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\arcsin(cx) - \frac{c^2x^3+6x}{c^2}\right)b^2c^2d + b^2dx\arcsin(cx)^2 - 2b^2d\left(x - \frac{\sqrt{-c^2x^2+1}\arcsin(cx)}{c}\right) + a^2dx + \frac{2\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)abd}{c}$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/3*b^2*c^2*d*x^3*arcsin(c*x)^2 - 1/3*a^2*c^2*d*x^3 - 2/9*(3*x^3*arcsin(c*
x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^2*d -
 2/27*(3*c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c
*x) - (c^2*x^3 + 6*x)/c^2)*b^2*c^2*d + b^2*d*x*arcsin(c*x)^2 - 2*b^2*d*(x -
 sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d*x + 2*(c*x*arcsin(c*x) + sqrt(-c
^2*x^2 + 1))*a*b*d/c
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 196, normalized size of antiderivative = 1.53

$$\int (d - c^2dx^2)(a + b\arcsin(cx))^2\,dx = -\frac{1}{3}a^2c^2dx^3 - \frac{1}{3}(c^2x^2-1)b^2dx\arcsin(cx)^2 - \frac{2}{3}(c^2x^2-1)abdx\arcsin(cx) + \frac{2}{3}b^2dx\arcsin(cx)^2 + \frac{2}{27}(c^2x^2-1)b^2dx + \frac{4}{3}abdx\arcsin(cx) + \frac{2(-c^2x^2+1)^{\frac{3}{2}}b^2d\arcsin(cx)}{9c} + a^2dx - \frac{40}{27}b^2dx + \frac{2(-c^2x^2+1)^{\frac{3}{2}}abd}{9c} + \frac{4\sqrt{-c^2x^2+1}b^2d\arcsin(cx)}{3c} + \frac{4\sqrt{-c^2x^2+1}abd}{3c}$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/3*a^2*c^2*d*x^3 - 1/3*(c^2*x^2 - 1)*b^2*d*x*arcsin(c*x)^2 - 2/3*(c^2*x^2
 - 1)*a*b*d*x*arcsin(c*x) + 2/3*b^2*d*x*arcsin(c*x)^2 + 2/27*(c^2*x^2 - 1)*
b^2*d*x + 4/3*a*b*d*x*arcsin(c*x) + 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*d*arcsin(c
*x)/c + a^2*d*x - 40/27*b^2*d*x + 2/9*(-c^2*x^2 + 1)^(3/2)*a*b*d/c + 4/3*sq
rt(-c^2*x^2 + 1)*b^2*d*arcsin(c*x)/c + 4/3*sqrt(-c^2*x^2 + 1)*a*b*d/c
```

Mupad [F(-1)]

Timed out.

$$\int (d-c^2dx^2)\,(a+b\arcsin(cx))^2\,dx=\int (a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d - c^2*d*x^2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d - c^2*d*x^2), x)
```

3.161 $\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 178

$$\begin{aligned}\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x}\,dx &= \frac{1}{4}b^2c^2dx^2-\frac{1}{2}bcdx\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\ &\quad -\frac{1}{4}d(a+b\arcsin(cx))^2 \\ &\quad +\frac{1}{2}d\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\ &\quad -\frac{id(a+b\arcsin(cx))^3}{3b} \\ &\quad +d(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) \\ &\quad -ibd(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) \\ &\quad +\frac{1}{2}b^2d\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)\end{aligned}$$

```
[Out] 1/4*b^2*c^2*d*x^2-1/4*d*(a+b*arcsin(c*x))^2+1/2*d*(-c^2*x^2+1)*(a+b*arcsin(
c*x))^2-1/3*I*d*(a+b*arcsin(c*x))^3/b+d*(a+b*arcsin(c*x))^2*ln(1-(I*c*x+(-c
^2*x^2+1)^(1/2))^2)-I*b*d*(a+b*arcsin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(
1/2))^2)+1/2*b^2*d*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b*c*d*x*(a+b
*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4787, 4721, 3798, 2221, 2611, 2320, 6724, 4741, 4737, 30}

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x}\,dx = \frac{1}{2}d(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{1}{2}bcdx\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - ibd\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx)) - \frac{id(a+b\arcsin(cx))^3}{3b} - \frac{1}{4}d(a+b\arcsin(cx))^2 + d\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))^2 + \frac{1}{2}b^2d\,\text{PolyLog}\left(3,e^{2i\arcsin(cx)}\right) + \frac{1}{4}b^2c^2dx^2$$

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (b^2*c^2*d*x^2)/4 - (b*c*d*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/2 - (d*
(a + b*ArcSin[c*x])^2)/4 + (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/2 - ((I/
3)*d*(a + b*ArcSin[c*x])^3)/b + d*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*Ar
cSin[c*x])] - I*b*d*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])] +
 (b^2*d*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{2}d\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+d\int\frac{(a+b\arcsin(cx))^2}{x}\,dx \\
&\quad-(bcd)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx \\
&= -\frac{1}{2}bcdx\sqrt{1-c^2x^2}(a+b\arcsin(cx))+\frac{1}{2}d\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad+d\text{Subst}\left(\int(a+bx)^2\cot(x)\,dx,x,\arcsin(cx)\right) \\
&\quad-\frac{1}{2}(bcd)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx+\frac{1}{2}\left(b^2c^2d\right)\int x\,dx \\
&= \frac{1}{4}b^2c^2dx^2-\frac{1}{2}bcdx\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{1}{4}d(a+b\arcsin(cx))^2 \\
&\quad+\frac{1}{2}d\left(1-c^2x^2\right)(a+b\arcsin(cx))^2-\frac{id(a+b\arcsin(cx))^3}{3b} \\
&\quad-(2id)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)^2}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right) \\
&= \frac{1}{4}b^2c^2dx^2-\frac{1}{2}bcdx\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad-\frac{1}{4}d(a+b\arcsin(cx))^2+\frac{1}{2}d\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad-\frac{id(a+b\arcsin(cx))^3}{3b}+d(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) \\
&\quad-(2bd)\text{Subst}\left(\int(a+bx)\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right) \\
&= \frac{1}{4}b^2c^2dx^2-\frac{1}{2}bcdx\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad-\frac{1}{4}d(a+b\arcsin(cx))^2+\frac{1}{2}d\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad-\frac{id(a+b\arcsin(cx))^3}{3b}+d(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) \\
&\quad-ibd(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) \\
&\quad+\left(ib^2d\right)\text{Subst}\left(\int\text{PolyLog}\left(2,e^{2ix}\right)\,dx,x,\arcsin(cx)\right)
\end{aligned}$$

$$
\begin{aligned}
&= \frac{1}{4}b^2c^2dx^2 - \frac{1}{2}bcdx\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad - \frac{1}{4}d(a+b\arcsin(cx))^2 + \frac{1}{2}d\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad - \frac{id(a+b\arcsin(cx))^3}{3b} + d(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) \\
&\quad - ibd(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) \\
&\quad + \frac{1}{2}\left(b^2d\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right) \\
&= \frac{1}{4}b^2c^2dx^2 - \frac{1}{2}bcdx\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad - \frac{1}{4}d(a+b\arcsin(cx))^2 + \frac{1}{2}d\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad - \frac{id(a+b\arcsin(cx))^3}{3b} + d(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) \\
&\quad - ibd(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) + \frac{1}{2}b^2d\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.41 (sec) , antiderivative size = 256, normalized size of antiderivative = 1.44

$$
\begin{aligned}
\int\frac{\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2}{x}\,dx &= \frac{1}{2}d\Bigg(-a^2c^2x^2 - 2abc^2x^2\arcsin(cx) \\
&\quad - ab\left(cx\sqrt{1-c^2x^2} - 2\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right) \\
&\quad + \frac{1}{4}b^2\left(-1+2\arcsin(cx)^2\right)\cos(2\arcsin(cx)) \\
&\quad + 4ab\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) + 2a^2\log(x) \\
&\quad - 2iab\left(\arcsin(cx)^2 + \operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\right) \\
&\quad + \frac{1}{12}b^2\Big(-i\pi^3 + 8i\arcsin(cx)^3 \\
&\quad + 24\arcsin(cx)^2\log\left(1-e^{-2i\arcsin(cx)}\right) \\
&\quad + 24i\arcsin(cx)\operatorname{PolyLog}\left(2,e^{-2i\arcsin(cx)}\right) \\
&\quad + 12\operatorname{PolyLog}\left(3,e^{-2i\arcsin(cx)}\right)\Big) \\
&\quad - \frac{1}{2}b^2\arcsin(cx)\sin(2\arcsin(cx))\Bigg)
\end{aligned}
$$

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (d*(-(a^2*c^2*x^2) - 2*a*b*c^2*x^2*ArcSin[c*x] - a*b*(c*x*Sqrt[1 - c^2*x^2]
 - 2*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])]) + (b^2*(-1 + 2*ArcSin[c*x]^2)*
Cos[2*ArcSin[c*x]])/4 + 4*a*b*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] +
2*a^2*Log[x] - (2*I)*a*b*(ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

```
) + (b^2*((-I)*Pi^3 + (8*I)*ArcSin[c*x]^3 + 24*ArcSin[c*x]^2*Log[1 - E^((-2
*I)*ArcSin[c*x])] + (24*I)*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] +
 12*PolyLog[3, E^((-2*I)*ArcSin[c*x])]))/12 - (b^2*ArcSin[c*x]*Sin[2*ArcSin
[c*x]])/2))/2
```

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 368, normalized size of antiderivative = 2.07

method	result
parts	$-d\,a^{2}\left(\frac{c^{2}x^{2}}{2}-\ln\left(x\right)\right)-d\,b^{2}\left(\frac{i\arcsin\left(cx\right)^{3}}{3}-\arcsin\left(cx\right)^{2}\ln\left(1+icx+\sqrt{-c^{2}x^{2}+1}\right)+2i\,\text{ar}$
derivativedivides	$-d\,a^{2}\left(\frac{c^{2}x^{2}}{2}-\ln\left(cx\right)\right)-d\,b^{2}\left(\frac{i\arcsin\left(cx\right)^{3}}{3}-\arcsin\left(cx\right)^{2}\ln\left(1+icx+\sqrt{-c^{2}x^{2}+1}\right)+2i\,\text{a}$
default	$-d\,a^{2}\left(\frac{c^{2}x^{2}}{2}-\ln\left(cx\right)\right)-d\,b^{2}\left(\frac{i\arcsin\left(cx\right)^{3}}{3}-\arcsin\left(cx\right)^{2}\ln\left(1+icx+\sqrt{-c^{2}x^{2}+1}\right)+2i\,\text{a}$

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x,x,method=_RETURNVERBOSE)
```

```
[Out] -d*a^2*(1/2*c^2*x^2-ln(x))-d*b^2*(1/3*I*arcsin(c*x)^3-arcsin(c*x)^2*ln(1+I*
c*x+(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)
)-2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2
+1)^(1/2))+2*I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-2*polylog(3,
I*c*x+(-c^2*x^2+1)^(1/2))-1/8*(2*arcsin(c*x)^2-1)*cos(2*arcsin(c*x))+1/4*ar
csin(c*x)*sin(2*arcsin(c*x)))-2*d*a*b*(1/2*I*arcsin(c*x)^2-arcsin(c*x)*ln(1
+I*c*x+(-c^2*x^2+1)^(1/2))+I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-arcsin(c*
x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+I*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/4
*arcsin(c*x)*cos(2*arcsin(c*x))+1/8*sin(2*arcsin(c*x)))
```

Fricas [F]

$$\int\frac{\left(d-c^{2}dx^{2}\right)\left(a+b\arcsin(cx)\right)^{2}}{x}\,dx=\int-\frac{\left(c^{2}dx^{2}-d\right)\left(b\arcsin\left(cx\right)+a\right)^{2}}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))/x, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x}\,dx = -d\left(\int \left(-\frac{a^2}{x}\right)dx + \int a^2c^2x\,dx + \int \left(-\frac{b^2\operatorname{asin}^2(cx)}{x}\right)dx + \int \left(-\frac{2ab\operatorname{asin}(cx)}{x}\right)dx + \int b^2c^2x\operatorname{asin}^2(cx)\,dx + \int 2abc^2x\operatorname{asin}(cx)\,dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2/x,x)
```

```
[Out] -d*(Integral(-a**2/x, x) + Integral(a**2*c**2*x, x) + Integral(-b**2*asin(c
*x)**2/x, x) + Integral(-2*a*b*asin(c*x)/x, x) + Integral(b**2*c**2*x*asin(
c*x)**2, x) + Integral(2*a*b*c**2*x*asin(c*x), x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x}\,dx = \int -\frac{(c^2dx^2-d)(b\arcsin(cx)+a)^2}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] -1/2*a^2*c^2*d*x^2 + a^2*d*log(x) - integrate(((b^2*c^2*d*x^2 - b^2*d)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*x^2 - a*b*d)*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/x, x)
```

Giac [F]

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x}\,dx = \int -\frac{(c^2dx^2-d)(b\arcsin(cx)+a)^2}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)^2/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x}\,dx = \int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(d-c^2\,d\,x^2\right)}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x, x)
```

3.162 $\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 149

$$\begin{aligned}\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^2}\,dx &= 2b^2c^2dx-2bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\ &\quad -2c^2dx(a+b\arcsin(cx))^2 \\ &\quad -\frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{x} \\ &\quad -4bcd(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right) \\ &\quad +2ib^2cd\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) \\ &\quad -2ib^2cd\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)\end{aligned}$$

```
[Out] 2*b^2*c^2*d*x-2*c^2*d*x*(a+b*arcsin(c*x))^2-d*(-c^2*x^2+1)*(a+b*arcsin(c*x)
)^2/x-4*b*c*d*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))+2*I*b^2*c
*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*b^2*c*d*polylog(2,I*c*x+(-c^2*x
^2+1)^(1/2))-2*b*c*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used

= {4785, 4715, 4767, 8, 4783, 4803, 4268, 2317, 2438}

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x^2}\,dx = -4bcd\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx)) - 2bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{x} - 2c^2dx(a+b\arcsin(cx))^2 + 2ib^2cd\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) - 2ib^2cd\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right) + 2b^2c^2dx$$

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] 2*b^2*c^2*d*x - 2*b*c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - 2*c^2*d*x*(
a + b*ArcSin[c*x])^2 - (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/x - 4*b*c*d*
(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])] + (2*I)*b^2*c*d*PolyLog[2, -
E^(I*ArcSin[c*x])] - (2*I)*b^2*c*d*PolyLog[2, E^(I*ArcSin[c*x])]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{x}+(2bcd)\int\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x}\,dx\\&\quad-\left(2c^2d\right)\int(a+b\arcsin(cx))^2\,dx\\&=2bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))-2c^2dx(a+b\arcsin(cx))^2-\frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{x}\\&\quad+(2bcd)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx-\left(2b^2c^2d\right)\int 1\,dx+\left(4bc^3d\right)\int\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx\end{aligned}$$

$$
\begin{aligned}
&= -2b^2c^2dx - 2bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad - 2c^2dx(a+b\arcsin(cx))^2 - \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{x} \\
&\quad + (2bcd)\text{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \arcsin(cx)\right) + \left(4b^2c^2d\right)\int 1\,dx \\
&= 2b^2c^2dx - 2bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - 2c^2dx(a+b\arcsin(cx))^2 \\
&\quad - \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{x} - 4bcd(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right) \\
&\quad - \left(2b^2cd\right)\text{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right) \\
&\quad + \left(2b^2cd\right)\text{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right) \\
&= 2b^2c^2dx - 2bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - 2c^2dx(a+b\arcsin(cx))^2 \\
&\quad - \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{x} - 4bcd(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right) \\
&\quad + \left(2ib^2cd\right)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right) \\
&\quad - \left(2ib^2cd\right)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(cx)}\right) \\
&= 2b^2c^2dx - 2bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - 2c^2dx(a+b\arcsin(cx))^2 \\
&\quad - \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{x} - 4bcd(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right) \\
&\quad + 2ib^2cd\,\text{PolyLog}\left(2, -e^{i\arcsin(cx)}\right) - 2ib^2cd\,\text{PolyLog}\left(2, e^{i\arcsin(cx)}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.36

$$
\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x^2}\,dx = -\frac{d\left(a^2+a^2c^2x^2+2abcx\left(\sqrt{1-c^2x^2}+cx\arcsin(cx)\right)+b^2cx\left(2\sqrt{1-c^2x^2}\arcsin(cx)+cx(-2+\arcsin(cx)\right.\right.}{}
$$

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] -((d*(a^2 + a^2*c^2*x^2 + 2*a*b*c*x*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]) +
 b^2*c*x*(2*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + c*x*(-2 + ArcSin[c*x]^2)) + 2*a
*b*(ArcSin[c*x] + c*x*ArcTanh[Sqrt[1 - c^2*x^2]]) - I*b^2*(I*ArcSin[c*x]*(A
rcSin[c*x] + 2*c*x*(-Log[1 - E^(I*ArcSin[c*x])] + Log[1 + E^(I*ArcSin[c*x])
])) + 2*c*x*PolyLog[2, -E^(I*ArcSin[c*x])] - 2*c*x*PolyLog[2, E^(I*ArcSin[c
*x])]))))/x)
```

Maple [A] (verified)

Time = 0.17 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.68

method	result
derivativedivides	$c\left(-d\,a^2\left(cx+\frac{1}{cx}\right)-2d\,b^2\arcsin\left(cx\right)\sqrt{-c^2x^2+1}-d\,b^2\arcsin\left(cx\right)^2cx+2d\,b^2cx-\frac{d\,b^2}{}\right.$
default	$c\left(-d\,a^2\left(cx+\frac{1}{cx}\right)-2d\,b^2\arcsin\left(cx\right)\sqrt{-c^2x^2+1}-d\,b^2\arcsin\left(cx\right)^2cx+2d\,b^2cx-\frac{d\,b^2}{}\right.$
parts	$-d\,a^2\left(c^2x+\frac{1}{x}\right)-2d\,b^2c\sqrt{-c^2x^2+1}\,\arcsin\left(cx\right)-d\,b^2c^2\arcsin\left(cx\right)^2x+2b^2c^2dx-\frac{d\,b^2}{}$

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^2,x,method=_RETURNVERBOSE)
[Out] c*(-d*a^2*(c*x+1/c/x)-2*d*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-d*b^2*arcsin(c
*x)^2*c*x+2*d*b^2*c*x-d*b^2/c/x*arcsin(c*x)^2-2*d*b^2*arcsin(c*x)*ln(1+I*c*
x+(-c^2*x^2+1)^(1/2))+2*d*b^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*
I*d*b^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*d*b^2*polylog(2,I*c*x+(-c^
2*x^2+1)^(1/2))-2*d*a*b*(c*x*arcsin(c*x)+1/c/x*arcsin(c*x)+(-c^2*x^2+1)^(1/
2)+arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x^2}\,dx=\int -\frac{(c^2dx^2-d)(b\arcsin\left(cx\right)+a)^2}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas")
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))/x^2, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x^2}\,dx=-d\left(\int a^2c^2\,dx+\int\left(-\frac{a^2}{x^2}\right)dx+\int b^2c^2\operatorname{asin}^2\left(cx\right)dx+\int\left(-\frac{b^2\operatorname{asin}^2\left(cx\right)}{x^2}\right)dx+\int 2abc^2\operatorname{asin}\left(cx\right)dx+\int\left(-\frac{2ab\operatorname{asin}\left(cx\right)}{x^2}\right)dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2/x**2,x)
[Out] -d*(Integral(a**2*c**2, x) + Integral(-a**2/x**2, x) + Integral(b**2*c**2*a
sin(c*x)**2, x) + Integral(-b**2*asin(c*x)**2/x**2, x) + Integral(2*a*b*c**
2*asin(c*x), x) + Integral(-2*a*b*asin(c*x)/x**2, x))
```

Maxima [F]

$$\int \frac{(d - c^2dx^2)(a + b\arcsin(cx))^2}{x^2}\,dx = \int -\frac{(c^2dx^2 - d)(b\arcsin(cx) + a)^2}{x^2}\,dx$$

[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima")

[Out] -b^2*c^2*d*x*arcsin(c*x)^2 + 2*b^2*c^2*d*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) - a^2*c^2*d*x - 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c*d - 2*(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*d - (2*c*x*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^3 - x), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)*b^2*d/x - a^2*d/x

Giac [F]

$$\int \frac{(d - c^2dx^2)(a + b\arcsin(cx))^2}{x^2}\,dx = \int -\frac{(c^2dx^2 - d)(b\arcsin(cx) + a)^2}{x^2}\,dx$$

[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")

[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)^2/x^2, x)

Mupad [F(-1)]

Timed out.

$$\int \frac{(d - c^2dx^2)(a + b\arcsin(cx))^2}{x^2}\,dx = \int \frac{(a + b\,\mathrm{asin}(c\,x))^2\,(d - c^2\,d\,x^2)}{x^2}\,dx$$

[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x^2,x)

[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x^2, x)

3.163 $\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^3}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 193

$$\begin{aligned}\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^3}\,dx = &-\frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x}\\ &-\frac{1}{2}c^2d(a+b\arcsin(cx))^2\\ &-\frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{2x^2}\\ &+\frac{ic^2d(a+b\arcsin(cx))^3}{3b}\\ &-c^2d(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right)\\ &+b^2c^2d\log(x)\\ &+ibc^2d(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\\ &-\frac{1}{2}b^2c^2d\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)\end{aligned}$$

```
[Out] -1/2*c^2*d*(a+b*arcsin(c*x))^2-1/2*d*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/x^2+1
/3*I*c^2*d*(a+b*arcsin(c*x))^3/b-c^2*d*(a+b*arcsin(c*x))^2*ln(1-(I*c*x+(-c^
2*x^2+1)^(1/2))^2)+b^2*c^2*d*ln(x)+I*b*c^2*d*(a+b*arcsin(c*x))*polylog(2,(I
*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b^2*c^2*d*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/
2))^2)-b*c*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/x
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 193, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4785, 4721, 3798, 2221, 2611, 2320, 6724, 4781, 29, 4737}

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^3}\,dx = ibc^2d\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx)) - \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{2x^2} - \frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x} + \frac{ic^2d(a+b\arcsin(cx))^3}{3b} - \frac{1}{2}c^2d(a+b\arcsin(cx))^2 - c^2d\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))^2 - \frac{1}{2}b^2c^2d\,\text{PolyLog}\left(3,e^{2i\arcsin(cx)}\right) + b^2c^2d\log(x)$$

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] -((b*c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/x) - (c^2*d*(a + b*ArcSin[c
*x])^2)/2 - (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*x^2) + ((I/3)*c^2*d*
(a + b*ArcSin[c*x])^3)/b - c^2*d*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*Arc
Sin[c*x])] + b^2*c^2*d*Log[x] + I*b*c^2*d*(a + b*ArcSin[c*x])*PolyLog[2, E^
((2*I)*ArcSin[c*x])] - (b^2*c^2*d*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{2x^2}+(bcd)\int\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x^2}\,dx \\
&\quad-(c^2d)\int\frac{(a+b\arcsin(cx))^2}{x}\,dx \\
&= -\frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x}-\frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{2x^2} \\
&\quad-(c^2d)\,\text{Subst}\left(\int(a+bx)^2\cot(x)\,dx,x,\arcsin(cx)\right) \\
&\quad+(b^2c^2d)\int\frac{1}{x}\,dx-(bc^3d)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x}-\frac{1}{2}c^2d(a+b\arcsin(cx))^2 \\
&\quad-\frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{2x^2}+\frac{ic^2d(a+b\arcsin(cx))^3}{3b} \\
&\quad+b^2c^2d\log(x)+(2ic^2d)\,\text{Subst}\left(\int\frac{e^{2ix}(a+bx)^2}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right) \\
&= -\frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x}-\frac{1}{2}c^2d(a+b\arcsin(cx))^2 \\
&\quad-\frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{2x^2}+\frac{ic^2d(a+b\arcsin(cx))^3}{3b} \\
&\quad-c^2d(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right)+b^2c^2d\log(x) \\
&\quad+(2bc^2d)\,\text{Subst}\left(\int(a+bx)\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right) \\
&= -\frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x}-\frac{1}{2}c^2d(a+b\arcsin(cx))^2 \\
&\quad-\frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{2x^2}+\frac{ic^2d(a+b\arcsin(cx))^3}{3b} \\
&\quad-c^2d(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right)+b^2c^2d\log(x) \\
&\quad+ibc^2d(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) \\
&\quad-(ib^2c^2d)\,\text{Subst}\left(\int\text{PolyLog}\left(2,e^{2ix}\right)\,dx,x,\arcsin(cx)\right)
\end{aligned}
$$

$$= -\frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x} - \frac{1}{2}c^2d(a+b\arcsin(cx))^2 - \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{2x^2} + \frac{ic^2d(a+b\arcsin(cx))^3}{3b} - c^2d(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) + b^2c^2d\log(x) + ibc^2d(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) - \frac{1}{2}(b^2c^2d)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)$$

$$= -\frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x} - \frac{1}{2}c^2d(a+b\arcsin(cx))^2 - \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{2x^2} + \frac{ic^2d(a+b\arcsin(cx))^3}{3b} - c^2d(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) + b^2c^2d\log(x) + ibc^2d(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) - \frac{1}{2}b^2c^2d\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 236, normalized size of antiderivative = 1.22

$$\int\frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^3}\,dx$$

$$= \frac{1}{2}d\left(-\frac{a^2}{x^2} - \frac{2ab\left(cx\sqrt{1-c^2x^2}+\arcsin(cx)\right)}{x^2} - 2a^2c^2\log(x) - \frac{b^2\left(2cx\sqrt{1-c^2x^2}\arcsin(cx)+\arcsin(cx)^2-2c^2x^2\log(cx)\right)}{x^2} + 2iabc^2\left(\arcsin(cx)\left(\arcsin(cx)+2i\log\left(1-e^{2i\arcsin(cx)}\right)\right)+\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\right) + \frac{1}{12}ib^2c^2\left(\pi^3-8\arcsin(cx)^3+24i\arcsin(cx)^2\log\left(1-e^{-2i\arcsin(cx)}\right) - 24\arcsin(cx)\operatorname{PolyLog}\left(2,e^{-2i\arcsin(cx)}\right)+12i\operatorname{PolyLog}\left(3,e^{-2i\arcsin(cx)}\right)\right)\right)$$

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (d*(-(a^2/x^2) - (2*a*b*(c*x*Sqrt[1 - c^2*x^2] + ArcSin[c*x]))/x^2 - 2*a^2*
c^2*Log[x] - (b^2*(2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]^2 - 2*
c^2*x^2*Log[c*x]))/x^2 + (2*I)*a*b*c^2*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*Lo
g[1 - E^((2*I)*ArcSin[c*x])]) + PolyLog[2, E^((2*I)*ArcSin[c*x])]) + (I/12)
*b^2*c^2*(Pi^3 - 8*ArcSin[c*x]^3 + (24*I)*ArcSin[c*x]^2*Log[1 - E^((-2*I)*A
rcSin[c*x])] - 24*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] + (12*I)*P
olyLog[3, E^((-2*I)*ArcSin[c*x])]))/2
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 457 vs. $2(211) = 422$.

Time = 0.26 (sec) , antiderivative size = 458, normalized size of antiderivative = 2.37

method	result
derivativedivides	$c^2\left(-d\,a^2\left(\frac{1}{2c^2x^2}+\ln(cx)\right)-d\,b^2\left(-\frac{i\arcsin(cx)^3}{3}+\frac{\arcsin(cx)\left(-2ic^2x^2+2cx\sqrt{-c^2x^2+1}+\arcsin(cx)\right)}{2c^2x^2}+\right.\right.$
default	$c^2\left(-d\,a^2\left(\frac{1}{2c^2x^2}+\ln(cx)\right)-d\,b^2\left(-\frac{i\arcsin(cx)^3}{3}+\frac{\arcsin(cx)\left(-2ic^2x^2+2cx\sqrt{-c^2x^2+1}+\arcsin(cx)\right)}{2c^2x^2}+\right.\right.$
parts	$-\frac{d\,a^2}{2x^2}-d\,a^2c^2\ln(x)-d\,b^2c^2\left(-\frac{i\arcsin(cx)^3}{3}+\frac{\arcsin(cx)\left(-2ic^2x^2+2cx\sqrt{-c^2x^2+1}+\arcsin(cx)\right)}{2c^2x^2}+\text{arcs}\right.$

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(-d*a^2*(1/2/c^2/x^2+ln(c*x))-d*b^2*(-1/3*I*arcsin(c*x)^3+1/2*arcsin(c*
x)*(-2*I*c^2*x^2+2*c*x*(-c^2*x^2+1)^(1/2)+arcsin(c*x))/c^2/x^2+arcsin(c*x)^
2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2
+1)^(1/2))+2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+arcsin(c*x)^2*ln(1-I*c*x-
(-c^2*x^2+1)^(1/2))-2*I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*p
olylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)+2*ln(I*c*
x+(-c^2*x^2+1)^(1/2))-ln(1+I*c*x+(-c^2*x^2+1)^(1/2)))-2*d*a*b*(-1/2*I*arcsi
n(c*x)^2+1/2*(-I*c^2*x^2+c*x*(-c^2*x^2+1)^(1/2)+arcsin(c*x))/c^2/x^2+arcsin
(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1
/2))-I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*polylog(2,I*c*x+(-c^2*x^2+1)^
(1/2))))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x^3}\,dx = \int -\frac{(c^2dx^2-d)(b\arcsin(cx)+a)^2}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))/x^3, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x^3}\,dx = -d\left(\int\left(-\frac{a^2}{x^3}\right)dx + \int\frac{a^2c^2}{x}\,dx + \int\left(-\frac{b^2\operatorname{asin}^2(cx)}{x^3}\right)dx + \int\left(-\frac{2ab\operatorname{asin}(cx)}{x^3}\right)dx + \int\frac{b^2c^2\operatorname{asin}^2(cx)}{x}\,dx + \int\frac{2abc^2\operatorname{asin}(cx)}{x}\,dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2/x**3,x)
[Out] -d*(Integral(-a**2/x**3, x) + Integral(a**2*c**2/x, x) + Integral(-b**2*asi
n(c*x)**2/x**3, x) + Integral(-2*a*b*asin(c*x)/x**3, x) + Integral(b**2*c**
2*asin(c*x)**2/x, x) + Integral(2*a*b*c**2*asin(c*x)/x, x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x^3}\,dx = \int -\frac{(c^2dx^2-d)(b\arcsin(cx)+a)^2}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima")
[Out] -a^2*c^2*d*log(x) - a*b*d*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) - 1/2*
a^2*d/x^2 - integrate((2*a*b*c^2*d*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)) + (b^2*c^2*d*x^2 - b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
^2)/x^3, x)
```

Giac [F]

$$\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x^3}\,dx = \int -\frac{(c^2dx^2-d)(b\arcsin(cx)+a)^2}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)^2/x^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)}{x^3}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x^3,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x^3, x)
```

3.164 $\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^4}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 176

$$\begin{aligned}\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^4}\,dx = &-\frac{b^2c^2d}{3x}-\frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2}\\&+\frac{2c^2d(a+b\arcsin(cx))^2}{3x}\\&-\frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{3x^3}\\&+\frac{10}{3}bc^3d(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)\\&-\frac{5}{3}ib^2c^3d\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)\\&+\frac{5}{3}ib^2c^3d\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)\end{aligned}$$

```
[Out] -1/3*b^2*c^2*d/x+2/3*c^2*d*(a+b*arcsin(c*x))^2/x-1/3*d*(-c^2*x^2+1)*(a+b*ar
csin(c*x))^2/x^3+10/3*b*c^3*d*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^
(1/2))-5/3*I*b^2*c^3*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+5/3*I*b^2*c^3*d
*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/3*b*c*d*(a+b*arcsin(c*x))*(-c^2*x^2+
1)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {4785, 4723, 4803, 4268, 2317, 2438, 4781, 30}

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^4}\,dx = \frac{10}{3}bc^3d\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx)) - \frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2} - \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{3x^3} + \frac{2c^2d(a+b\arcsin(cx))^2}{3x} - \frac{5}{3}ib^2c^3d\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) + \frac{5}{3}ib^2c^3d\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right) - \frac{b^2c^2d}{3x}$$

```
[In] Int[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -1/3*(b^2*c^2*d)/x - (b*c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*x^2)
+ (2*c^2*d*(a + b*ArcSin[c*x])^2)/(3*x) - (d*(1 - c^2*x^2)*(a + b*ArcSin[c*
x])^2)/(3*x^3) + (10*b*c^3*d*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])]
)/3 - ((5*I)/3)*b^2*c^3*d*PolyLog[2, -E^(I*ArcSin[c*x])] + ((5*I)/3)*b^2*c^
3*d*PolyLog[2, E^(I*ArcSin[c*x])]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
```

```
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\text{integral} = -\frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3x^3} + \frac{1}{3}(2bcd)\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x^3}\,dx - \frac{1}{3}(2c^2d)\int \frac{(a+b\arcsin(cx))^2}{x^2}\,dx$$

$$= -\frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2} + \frac{2c^2d(a+b\arcsin(cx))^2}{3x} - \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3x^3} + \frac{1}{3}\left(b^2c^2d\right)\int \frac{1}{x^2}\,dx - \frac{1}{3}\left(bc^3d\right)\int \frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx - \frac{1}{3}\left(4bc^3d\right)\int \frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{b^2c^2d}{3x} - \frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2} + \frac{2c^2d(a+b\arcsin(cx))^2}{3x} - \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3x^3} - \frac{1}{3}\left(bc^3d\right)\text{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \arcsin(cx)\right) - \frac{1}{3}\left(4bc^3d\right)\text{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \arcsin(cx)\right)$$

$$= -\frac{b^2c^2d}{3x} - \frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2} + \frac{2c^2d(a+b\arcsin(cx))^2}{3x} - \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3x^3} + \frac{10}{3}bc^3d(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right) + \frac{1}{3}\left(b^2c^3d\right)\text{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right) - \frac{1}{3}\left(b^2c^3d\right)\text{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right) + \frac{1}{3}\left(4b^2c^3d\right)\text{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right) - \frac{1}{3}\left(4b^2c^3d\right)\text{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)$$

$$= -\frac{b^2c^2d}{3x} - \frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2} + \frac{2c^2d(a+b\arcsin(cx))^2}{3x} - \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3x^3} + \frac{10}{3}bc^3d(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right) - \frac{1}{3}\left(ib^2c^3d\right)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right) + \frac{1}{3}\left(ib^2c^3d\right)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(cx)}\right) - \frac{1}{3}\left(4ib^2c^3d\right)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right) + \frac{1}{3}\left(4ib^2c^3d\right)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)$$

$$= -\frac{b^2c^2d}{3x} - \frac{bcd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2} + \frac{2c^2d(a+b\arcsin(cx))^2}{3x} - \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{3x^3} + \frac{10}{3}bc^3d(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right) - \frac{5}{3}ib^2c^3d\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) + \frac{5}{3}ib^2c^3d\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.63 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.51

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^4}\,dx = \frac{d\left(-a^2+3a^2c^2x^2-b^2c^2x^2-abcx\sqrt{1-c^2x^2}-2ab\arcsin(cx)+6abc^2x^2\arcsin(cx)-b^2cx\sqrt{1-c^2x^2}\,\text{arcsi}\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (d*(-a^2 + 3*a^2*c^2*x^2 - b^2*c^2*x^2 - a*b*c*x*Sqrt[1 - c^2*x^2] - 2*a*b*
ArcSin[c*x] + 6*a*b*c^2*x^2*ArcSin[c*x] - b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[
c*x] - b^2*ArcSin[c*x]^2 + 3*b^2*c^2*x^2*ArcSin[c*x]^2 + 5*a*b*c^3*x^3*ArcT
anh[Sqrt[1 - c^2*x^2]] - 5*b^2*c^3*x^3*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x]
)] + 5*b^2*c^3*x^3*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (5*I)*b^2*c^3*x
^3*PolyLog[2, -E^(I*ArcSin[c*x])] + (5*I)*b^2*c^3*x^3*PolyLog[2, E^(I*ArcSi
n[c*x])]))/(3*x^3)
```

Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 261, normalized size of antiderivative = 1.48

method	result
parts	$-d\,a^2\left(-\frac{c^2}{x}+\frac{1}{3x^3}\right)-d\,b^2c^3\left(-\frac{3\arcsin(cx)^2x^2c^2-\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcsin(cx)^2-c^2x^2}{3c^3x^3}-\frac{5\arcsin(}{}\right.$
derivativedivides	$c^3\left(-d\,a^2\left(\frac{1}{3c^3x^3}-\frac{1}{cx}\right)-d\,b^2\left(-\frac{3\arcsin(cx)^2x^2c^2-\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcsin(cx)^2-c^2x^2}{3c^3x^3}-\frac{5\arcsi}{}\right.\right.$
default	$c^3\left(-d\,a^2\left(\frac{1}{3c^3x^3}-\frac{1}{cx}\right)-d\,b^2\left(-\frac{3\arcsin(cx)^2x^2c^2-\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcsin(cx)^2-c^2x^2}{3c^3x^3}-\frac{5\arcsi}{}\right.\right.$

```
[In] int((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -d*a^2*(-c^2/x+1/3/x^3)-d*b^2*c^3*(-1/3*(3*arcsin(c*x)^2*x^2*c^2-(-c^2*x^2+
1)^(1/2)*arcsin(c*x)*x*c-arcsin(c*x)^2-c^2*x^2)/c^3/x^3-5/3*arcsin(c*x)*ln(
```

```
1+I*c*x+(-c^2*x^2+1)^(1/2))+5/3*I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+5/3*
arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-5/3*I*polylog(2,I*c*x+(-c^2*x^2+
1)^(1/2)))-2*d*a*b*c^3*(1/3/c^3/x^3*arcsin(c*x)-1/c/x*arcsin(c*x)+1/6/c^2/x
^2*(-c^2*x^2+1)^(1/2)-5/6*arctanh(1/(-c^2*x^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^4}\,dx = \int -\frac{(c^2dx^2-d)(b\arcsin(cx)+a)^2}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas")
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))/x^4, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^4}\,dx = -d\left(\int \left(-\frac{a^2}{x^4}\right)dx + \int \frac{a^2c^2}{x^2}\,dx + \int \left(-\frac{b^2\operatorname{asin}^2(cx)}{x^4}\right)dx + \int \left(-\frac{2ab\operatorname{asin}(cx)}{x^4}\right)dx + \int \frac{b^2c^2\operatorname{asin}^2(cx)}{x^2}\,dx + \int \frac{2abc^2\operatorname{asin}(cx)}{x^2}\,dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)*(a+b*asin(c*x))**2/x**4,x)
[Out] -d*(Integral(-a**2/x**4, x) + Integral(a**2*c**2/x**2, x) + Integral(-b**2*
asin(c*x)**2/x**4, x) + Integral(-2*a*b*asin(c*x)/x**4, x) + Integral(b**2*
c**2*asin(c*x)**2/x**2, x) + Integral(2*a*b*c**2*asin(c*x)/x**2, x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^4}\,dx = \int -\frac{(c^2dx^2-d)(b\arcsin(cx)+a)^2}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima")
[Out] 2*(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*c^2*d
 - 1/3*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 +
```

```
1)/x^2)*c + 2*arcsin(c*x)/x^3)*a*b*d + a^2*c^2*d/x - 1/3*a^2*d/x^3 + 1/3*(3
*x^3*integrate(2/3*(3*b^2*c^3*d*x^2 - b^2*c*d)*sqrt(c*x + 1)*sqrt(-c*x + 1)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^5 - x^3), x) + (3*b^2*c^
2*d*x^2 - b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/x^3
```

Giac [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^4}\,dx = \text{Timed out}$$

```
[In] integrate((-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)(a+b\arcsin(cx))^2}{x^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)}{x^4}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x^4,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2))/x^4, x)
```

3.165 $\int x^4(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 27, antiderivative size = 395

$$\begin{aligned}\int x^4(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx &= -\frac{4208b^2d^2x}{99225c^4}-\frac{2104b^2d^2x^3}{297675c^2}-\frac{526b^2d^2x^5}{165375} \\ &+\frac{212b^2c^2d^2x^7}{27783}-\frac{2}{729}b^2c^4d^2x^9+\frac{128bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{4725c^5} \\ &+\frac{64bd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{4725c^3}+\frac{16bd^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{1575c} \\ &+\frac{8bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{189c^5}-\frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{315c^5} \\ &-\frac{20bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{441c^5}+\frac{2bd^2(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{81c^5} \\ &+\frac{8}{315}d^2x^5(a+b\arcsin(cx))^2+\frac{4}{63}d^2x^5(1-c^2x^2)(a+b\arcsin(cx))^2+\frac{1}{9}d^2x^5(1-c^2x^2)^2(a+b\arcsin(cx))^2\end{aligned}$$

```
[Out] -4208/99225*b^2*d^2*x/c^4-2104/297675*b^2*d^2*x^3/c^2-526/165375*b^2*d^2*x^
5+212/27783*b^2*c^2*d^2*x^7-2/729*b^2*c^4*d^2*x^9+8/189*b*d^2*(-c^2*x^2+1)^
(3/2)*(a+b*arcsin(c*x))/c^5-2/315*b*d^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x)
)/c^5-20/441*b*d^2*(-c^2*x^2+1)^(7/2)*(a+b*arcsin(c*x))/c^5+2/81*b*d^2*(-c^
2*x^2+1)^(9/2)*(a+b*arcsin(c*x))/c^5+8/315*d^2*x^5*(a+b*arcsin(c*x))^2+4/63
*d^2*x^5*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+1/9*d^2*x^5*(-c^2*x^2+1)^2*(a+b*a
rcsin(c*x))^2+128/4725*b*d^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^5+64/47
25*b*d^2*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+16/1575*b*d^2*x^4*(a+
b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 395, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.407, Rules used = {4787, 4723, 4795, 4767, 8, 30, 272, 45, 4779, 12, 1167}

$$\int x^4(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx=\frac{1}{9}d^2x^5(1-c^2x^2)^2(a+b\arcsin(cx))^2+\frac{4}{63}d^2x^5(1-c^2x^2)(a+b\arcsin(cx))^2+\frac{16bd^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{1575c}+\frac{2bd^2(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{81c^5}-\frac{20bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{441c^5}-\frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{315c^5}+\frac{8bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{189c^5}+\frac{128bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{4725c^5}+\frac{64bd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{4725c^3}+\frac{8}{315}d^2x^5(a+b\arcsin(cx))^2-\frac{2}{729}b^2c^4d^2x^9-\frac{4208b^2d^2x}{99225c^4}+\frac{212b^2c^2d^2x^7}{27783}-\frac{2104b^2d^2x^3}{297675c^2}-\frac{526b^2d^2x^5}{165375}$$

```
[In] Int[x^4*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-4208*b^2*d^2*x)/(99225*c^4) - (2104*b^2*d^2*x^3)/(297675*c^2) - (526*b^2*
d^2*x^5)/165375 + (212*b^2*c^2*d^2*x^7)/27783 - (2*b^2*c^4*d^2*x^9)/729 + (
128*b*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(4725*c^5) + (64*b*d^2*x^2
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(4725*c^3) + (16*b*d^2*x^4*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(1575*c) + (8*b*d^2*(1 - c^2*x^2)^(3/2)*(a +
 b*ArcSin[c*x]))/(189*c^5) - (2*b*d^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x
]))/(315*c^5) - (20*b*d^2*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(441*c^5
) + (2*b*d^2*(1 - c^2*x^2)^(9/2)*(a + b*ArcSin[c*x]))/(81*c^5) + (8*d^2*x^5
*(a + b*ArcSin[c*x])^2)/315 + (4*d^2*x^5*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^
2)/63 + (d^2*x^5*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/9
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{9}d^2x^5\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+\frac{1}{9}(4d)\int x^4\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$-\frac{1}{9}\left(2bcd^2\right)\int x^5\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx$$
$$=\frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{45c^5}$$
$$-\frac{4bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{63c^5}+\frac{2bd^2(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{81c^5}$$
$$+\frac{4}{63}d^2x^5\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{1}{9}d^2x^5\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+\frac{1}{63}\left(8d^2\right)\int x^4(a+b\,\mathrm{a}$$
$$=\frac{8bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{189c^5}-\frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{315c^5}$$
$$-\frac{20bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{441c^5}+\frac{2bd^2(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{81c^5}$$
$$+\frac{8}{315}d^2x^5(a+b\arcsin(cx))^2+\frac{4}{63}d^2x^5\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{1}{9}d^2x^5\left(1-c^2x^2\right)^2(a+b\arcsin($$

$$= \frac{16bd^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{1575c} + \frac{8bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{189c^5} - \frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{315c^5} - \frac{20bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{441c^5} + \frac{2bd^2(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{81c^5} + \frac{8}{315}d^2x^5(a+b\arcsin(cx))^2 + \frac{4}{63}d^2x^5(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{1}{9}d^2x^5(1-c^2x^2)^2(a+b\arcsin(c$$

$$= -\frac{304b^2d^2x}{19845c^4} - \frac{152b^2d^2x^3}{59535c^2} - \frac{526b^2d^2x^5}{165375} + \frac{212b^2c^2d^2x^7}{27783} - \frac{2}{729}b^2c^4d^2x^9 + \frac{64bd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{4725c^3} + \frac{16bd^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{1575c} + \frac{8bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{189c^5} - \frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{315c^5} - \frac{20bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{441c^5} + \frac{2bd^2(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{81c^5} + \frac{8}{315}d^2x^5(a+b\arcsin(cx))^2 + \frac{4}{63}d^2x^5(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{1}{9}d^2x^5(1-c^2x^2)^2(a+b\arcsin(c$$

$$= -\frac{304b^2d^2x}{19845c^4} - \frac{2104b^2d^2x^3}{297675c^2} - \frac{526b^2d^2x^5}{165375} + \frac{212b^2c^2d^2x^7}{27783} - \frac{2}{729}b^2c^4d^2x^9 + \frac{128bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{4725c^5} + \frac{64bd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{4725c^3} + \frac{16bd^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{1575c} + \frac{8bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{189c^5} - \frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{315c^5} - \frac{20bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{441c^5} + \frac{2bd^2(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{81c^5} + \frac{8}{315}d^2x^5(a+b\arcsin(cx))^2 + \frac{4}{63}d^2x^5(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{1}{9}d^2x^5(1-c^2x^2)^2(a+b\arcsin(c$$

$$= -\frac{4208b^2d^2x}{99225c^4} - \frac{2104b^2d^2x^3}{297675c^2} - \frac{526b^2d^2x^5}{165375} + \frac{212b^2c^2d^2x^7}{27783} - \frac{2}{729}b^2c^4d^2x^9 + \frac{128bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{4725c^5} + \frac{64bd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{4725c^3} + \frac{16bd^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{1575c} + \frac{8bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{189c^5} - \frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{315c^5} - \frac{20bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{441c^5} + \frac{2bd^2(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{81c^5} + \frac{8}{315}d^2x^5(a+b\arcsin(cx))^2 + \frac{4}{63}d^2x^5(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{1}{9}d^2x^5(1-c^2x^2)^2(a+b\arcsin($$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 253, normalized size of antiderivative = 0.64

$$\int x^4(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx = \frac{d^2(99225a^2c^5x^5(63-90c^2x^2+35c^4x^4)+630ab\sqrt{1-c^2x^2}(2104+1052c^2x^2+789c^4x^4-2650c^6x^6+122}{}$$

```
[In] Integrate[x^4*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(99225*a^2*c^5*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4) + 630*a*b*Sqrt[1 - c
^2*x^2]*(2104 + 1052*c^2*x^2 + 789*c^4*x^4 - 2650*c^6*x^6 + 1225*c^8*x^8) -
 2*b^2*c*x*(662760 + 110460*c^2*x^2 + 49707*c^4*x^4 - 119250*c^6*x^6 + 4287
5*c^8*x^8) + 630*b*(315*a*c^5*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4) + b*Sqrt[1
 - c^2*x^2]*(2104 + 1052*c^2*x^2 + 789*c^4*x^4 - 2650*c^6*x^6 + 1225*c^8*x^
8))*ArcSin[c*x] + 99225*b^2*c^5*x^5*(63 - 90*c^2*x^2 + 35*c^4*x^4)*ArcSin[c
*x]^2))/(31255875*c^5)
```

Maple [A] (verified)

Time = 0.38 (sec) , antiderivative size = 530, normalized size of antiderivative = 1.34

method	result
parts	$d^2a^2\left(\frac{1}{9}c^4x^9-\frac{2}{7}c^2x^7+\frac{1}{5}x^5\right)+\frac{d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{525}-\frac{2\left(3c^4\right.}{}\right.}{}$
derivativedivides	$\frac{d^2a^2\left(\frac{1}{9}c^9x^9-\frac{2}{7}c^7x^7+\frac{1}{5}c^5x^5\right)+d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{525}-\frac{2\left(3c^4x^4-10c^2x^2\right.}{7875}\right.}{}$
default	$\frac{d^2a^2\left(\frac{1}{9}c^9x^9-\frac{2}{7}c^7x^7+\frac{1}{5}c^5x^5\right)+d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{525}-\frac{2\left(3c^4x^4-10c^2x^2\right.}{7875}\right.}{}$

```
[In] int(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] d^2*a^2*(1/9*c^4*x^9-2/7*c^2*x^7+1/5*x^5)+d^2*b^2/c^5*(1/15*arcsin(c*x)^2*(
3*c^4*x^4-10*c^2*x^2+15)*c*x+2/525*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(
1/2)-2/7875*(3*c^4*x^4-10*c^2*x^2+15)*c*x-8/945*arcsin(c*x)*(c^2*x^2-1)*(-c
^2*x^2+1)^(1/2)+8/2835*(c^2*x^2-3)*c*x-16/315*c*x+16/315*arcsin(c*x)*(-c^2*
x^2+1)^(1/2)+2/35*arcsin(c*x)^2*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x+20
/441*arcsin(c*x)*(c^2*x^2-1)^3*(-c^2*x^2+1)^(1/2)-4/3087*(5*c^6*x^6-21*c^4*
x^4+35*c^2*x^2-35)*c*x+1/315*arcsin(c*x)^2*(35*c^8*x^8-180*c^6*x^6+378*c^4*
x^4-420*c^2*x^2+315)*c*x+2/81*arcsin(c*x)*(c^2*x^2-1)^4*(-c^2*x^2+1)^(1/2)-
2/25515*(35*c^8*x^8-180*c^6*x^6+378*c^4*x^4-420*c^2*x^2+315)*c*x)+2*d^2*a*b
/c^5*(1/9*arcsin(c*x)*c^9*x^9-2/7*arcsin(c*x)*c^7*x^7+1/5*arcsin(c*x)*c^5*x
^5+1/81*c^8*x^8*(-c^2*x^2+1)^(1/2)-106/3969*c^6*x^6*(-c^2*x^2+1)^(1/2)+263/
33075*c^4*x^4*(-c^2*x^2+1)^(1/2)+1052/99225*c^2*x^2*(-c^2*x^2+1)^(1/2)+2104
/99225*(-c^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 337, normalized size of antiderivative = 0.85

$$\int x^4\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2\,dx$$
$$=\frac{42875\left(81a^2-2b^2\right)c^9d^2x^9-2250\left(3969a^2-106b^2\right)c^7d^2x^7+189\left(33075a^2-526b^2\right)c^5d^2x^5-220920b^2c^3d\cdots}{}$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/31255875*(42875*(81*a^2 - 2*b^2)*c^9*d^2*x^9 - 2250*(3969*a^2 - 106*b^2)*
c^7*d^2*x^7 + 189*(33075*a^2 - 526*b^2)*c^5*d^2*x^5 - 220920*b^2*c^3*d^2*x^
3 - 1325520*b^2*c*d^2*x + 99225*(35*b^2*c^9*d^2*x^9 - 90*b^2*c^7*d^2*x^7 +
63*b^2*c^5*d^2*x^5)*arcsin(c*x)^2 + 198450*(35*a*b*c^9*d^2*x^9 - 90*a*b*c^7
*d^2*x^7 + 63*a*b*c^5*d^2*x^5)*arcsin(c*x) + 630*(1225*a*b*c^8*d^2*x^8 - 26
50*a*b*c^6*d^2*x^6 + 789*a*b*c^4*d^2*x^4 + 1052*a*b*c^2*d^2*x^2 + 2104*a*b*
d^2 + (1225*b^2*c^8*d^2*x^8 - 2650*b^2*c^6*d^2*x^6 + 789*b^2*c^4*d^2*x^4 +
1052*b^2*c^2*d^2*x^2 + 2104*b^2*d^2)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] (verification not implemented)

Time = 1.63 (sec) , antiderivative size = 563, normalized size of antiderivative = 1.43

$$\int x^4(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx$$
$$=\begin{cases}\frac{a^2c^4d^2x^9}{9}-\frac{2a^2c^2d^2x^7}{7}+\frac{a^2d^2x^5}{5}+\frac{2abc^4d^2x^9\operatorname{asin}(cx)}{9}+\frac{2abc^3d^2x^8\sqrt{-c^2x^2+1}}{81}-\frac{4abc^2d^2x^7\operatorname{asin}(cx)}{7}-\frac{212abcd^2x^6\sqrt{-c^2x^2+1}}{3969}+ \\ \frac{a^2d^2x^5}{5}\end{cases}$$

```
[In] integrate(x**4*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**9/9 - 2*a**2*c**2*d**2*x**7/7 + a**2*d**2*x**5
/5 + 2*a*b*c**4*d**2*x**9*asin(c*x)/9 + 2*a*b*c**3*d**2*x**8*sqrt(-c**2*x**
2 + 1)/81 - 4*a*b*c**2*d**2*x**7*asin(c*x)/7 - 212*a*b*c*d**2*x**6*sqrt(-c*
*2*x**2 + 1)/3969 + 2*a*b*d**2*x**5*asin(c*x)/5 + 526*a*b*d**2*x**4*sqrt(-c
**2*x**2 + 1)/(33075*c) + 2104*a*b*d**2*x**2*sqrt(-c**2*x**2 + 1)/(99225*c*
*3) + 4208*a*b*d**2*sqrt(-c**2*x**2 + 1)/(99225*c**5) + b**2*c**4*d**2*x**9
*asin(c*x)**2/9 - 2*b**2*c**4*d**2*x**9/729 + 2*b**2*c**3*d**2*x**8*sqrt(-c
**2*x**2 + 1)*asin(c*x)/81 - 2*b**2*c**2*d**2*x**7*asin(c*x)**2/7 + 212*b**
2*c**2*d**2*x**7/27783 - 212*b**2*c*d**2*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x
)/3969 + b**2*d**2*x**5*asin(c*x)**2/5 - 526*b**2*d**2*x**5/165375 + 526*b*
*2*d**2*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/(33075*c) - 2104*b**2*d**2*x**3
/(297675*c**2) + 2104*b**2*d**2*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(99225*
c**3) - 4208*b**2*d**2*x/(99225*c**4) + 4208*b**2*d**2*sqrt(-c**2*x**2 + 1)
*asin(c*x)/(99225*c**5), Ne(c, 0)), (a**2*d**2*x**5/5, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 781 vs. $2(349) = 698$.

Time = 0.30 (sec) , antiderivative size = 781, normalized size of antiderivative = 1.98

$$\int x^4(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx = \frac{1}{9}b^2c^4d^2x^9\arcsin(cx)^2 + \frac{1}{9}a^2c^4d^2x^9 - \frac{2}{7}b^2c^2d^2x^7\arcsin(cx)^2 - \frac{2}{7}a^2c^2d^2x^7 + \frac{1}{5}b^2d^2x^5\arcsin(cx)^2 + \frac{2}{2835}\left(315x^9\arcsin(cx) + \left(\frac{35\sqrt{-c^2x^2+1}x^8}{c^2} + \frac{40\sqrt{-c^2x^2+1}x^6}{c^4} + \frac{48\sqrt{-c^2x^2+1}x^4}{c^6} + \frac{64\sqrt{-c^2x^2+1}x^2}{c^8} \cdots\right.\right.$$
$$+\frac{2}{893025}\left(315\left(\frac{35\sqrt{-c^2x^2+1}x^8}{c^2} + \frac{40\sqrt{-c^2x^2+1}x^6}{c^4} + \frac{48\sqrt{-c^2x^2+1}x^4}{c^6} + \frac{64\sqrt{-c^2x^2+1}x^2}{c^8} + \frac{128\sqrt{\cdots}}{\cdots}\right.\right.$$
$$+\frac{1}{5}a^2d^2x^5$$
$$-\frac{4}{245}\left(35x^7\arcsin(cx) + \left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2} + \frac{6\sqrt{-c^2x^2+1}x^4}{c^4} + \frac{8\sqrt{-c^2x^2+1}x^2}{c^6} + \frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c \cdots\right.$$
$$-\frac{4}{25725}\left(105\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2} + \frac{6\sqrt{-c^2x^2+1}x^4}{c^4} + \frac{8\sqrt{-c^2x^2+1}x^2}{c^6} + \frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\arcsin(cx) - \cdots\right.$$
$$+\frac{2}{75}\left(15x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abd^2$$
$$+\frac{2}{1125}\left(15\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\arcsin(cx) - \frac{9c^4x^5+20c^2x^3+120\cdots}{c^4}\right.$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/9*b^2*c^4*d^2*x^9*arcsin(c*x)^2 + 1/9*a^2*c^4*d^2*x^9 - 2/7*b^2*c^2*d^2*x
^7*arcsin(c*x)^2 - 2/7*a^2*c^2*d^2*x^7 + 1/5*b^2*d^2*x^5*arcsin(c*x)^2 + 2/
2835*(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x
^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2
/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*a*b*c^4*d^2 + 2/893025*(315*(35*sqrt
(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 +
 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*
c*arcsin(c*x) - (1225*c^8*x^9 + 1800*c^6*x^7 + 3024*c^4*x^5 + 6720*c^2*x^3
+ 40320*x)/c^8)*b^2*c^4*d^2 + 1/5*a^2*d^2*x^5 - 4/245*(35*x^7*arcsin(c*x) +
 (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2
*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^2*d^2 - 4/25725*(10
5*(5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^
2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7
 + 126*c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2*c^2*d^2 + 2/75*(15*x^5*arcs
in(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*
sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*d^2 + 2/1125*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c
^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x)
 - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*d^2
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 702 vs. $2(349) = 698$.

Time = 0.36 (sec) , antiderivative size = 702, normalized size of antiderivative = 1.78

$$\int x^4 \left(d-c^2 d x^2\right)^2 (a+b \arcsin(cx))^2 \, dx = \frac{1}{9} a^2 c^4 d^2 x^9 - \frac{2}{7} a^2 c^2 d^2 x^7 + \frac{1}{5} a^2 d^2 x^5 + \frac{\left(c^2 x^2-1\right)^4 b^2 d^2 x \arcsin(cx)^2}{9 c^4} + \frac{2 \left(c^2 x^2-1\right)^4 a b d^2 x \arcsin(cx)}{9 c^4} + \frac{10 \left(c^2 x^2-1\right)^3 b^2 d^2 x \arcsin(cx)^2}{63 c^4} - \frac{2 \left(c^2 x^2-1\right)^4 b^2 d^2 x}{729 c^4} + \frac{20 \left(c^2 x^2-1\right)^3 a b d^2 x \arcsin(cx)}{63 c^4} + \frac{\left(c^2 x^2-1\right)^2 b^2 d^2 x \arcsin(cx)^2}{105 c^4} + \frac{2 \left(c^2 x^2-1\right)^4 \sqrt{-c^2 x^2+1}\, b^2 d^2 \arcsin(cx)}{81 c^5} - \frac{836 \left(c^2 x^2-1\right)^3 b^2 d^2 x}{250047 c^4} + \frac{2 \left(c^2 x^2-1\right)^2 a b d^2 x \arcsin(cx)}{105 c^4} - \frac{4 \left(c^2 x^2-1\right) b^2 d^2 x \arcsin(cx)^2}{315 c^4} + \frac{2 \left(c^2 x^2-1\right)^4 \sqrt{-c^2 x^2+1}\, a b d^2}{81 c^5} + \frac{20 \left(c^2 x^2-1\right)^3 \sqrt{-c^2 x^2+1}\, b^2 d^2 \arcsin(cx)}{441 c^5} + \frac{33862 \left(c^2 x^2-1\right)^2 b^2 d^2 x}{10418625 c^4} - \frac{8 \left(c^2 x^2-1\right) a b d^2 x \arcsin(cx)}{315 c^4} + \frac{8 b^2 d^2 x \arcsin(cx)^2}{315 c^4} + \frac{20 \left(c^2 x^2-1\right)^3 \sqrt{-c^2 x^2+1}\, a b d^2}{441 c^5} + \frac{2 \left(c^2 x^2-1\right)^2 \sqrt{-c^2 x^2+1}\, b^2 d^2 \arcsin(cx)}{525 c^5} - \frac{47248 \left(c^2 x^2-1\right) b^2 d^2 x}{31255875 c^4} + \frac{16 a b d^2 x \arcsin(cx)}{315 c^4} + \frac{2 \left(c^2 x^2-1\right)^2 \sqrt{-c^2 x^2+1}\, a b d^2}{525 c^5} + \frac{8 \left(-c^2 x^2+1\right)^{\frac{3}{2}} b^2 d^2 \arcsin(cx)}{945 c^5} - \frac{1493104 b^2 d^2 x}{31255875 c^4} + \frac{8 \left(-c^2 x^2+1\right)^{\frac{3}{2}} a b d^2}{945 c^5} + \frac{16 \sqrt{-c^2 x^2+1}\, b^2 d^2 \arcsin(cx)}{315 c^5}$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/9*a^2*c^4*d^2*x^9 - 2/7*a^2*c^2*d^2*x^7 + 1/5*a^2*d^2*x^5 + 1/9*(c^2*x^2
- 1)^4*b^2*d^2*x*arcsin(c*x)^2/c^4 + 2/9*(c^2*x^2 - 1)^4*a*b*d^2*x*arcsin(c
*x)/c^4 + 10/63*(c^2*x^2 - 1)^3*b^2*d^2*x*arcsin(c*x)^2/c^4 - 2/729*(c^2*x^
2 - 1)^4*b^2*d^2*x/c^4 + 20/63*(c^2*x^2 - 1)^3*a*b*d^2*x*arcsin(c*x)/c^4 +
1/105*(c^2*x^2 - 1)^2*b^2*d^2*x*arcsin(c*x)^2/c^4 + 2/81*(c^2*x^2 - 1)^4*sq
rt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^5 - 836/250047*(c^2*x^2 - 1)^3*b^2*d
^2*x/c^4 + 2/105*(c^2*x^2 - 1)^2*a*b*d^2*x*arcsin(c*x)/c^4 - 4/315*(c^2*x^2
 - 1)*b^2*d^2*x*arcsin(c*x)^2/c^4 + 2/81*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)
*a*b*d^2/c^5 + 20/441*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x
)/c^5 + 33862/10418625*(c^2*x^2 - 1)^2*b^2*d^2*x/c^4 - 8/315*(c^2*x^2 - 1)*
a*b*d^2*x*arcsin(c*x)/c^4 + 8/315*b^2*d^2*x*arcsin(c*x)^2/c^4 + 20/441*(c^2
*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*d^2/c^5 + 2/525*(c^2*x^2 - 1)^2*sqrt(-c^
2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^5 - 47248/31255875*(c^2*x^2 - 1)*b^2*d^2*x
/c^4 + 16/315*a*b*d^2*x*arcsin(c*x)/c^4 + 2/525*(c^2*x^2 - 1)^2*sqrt(-c^2*x
^2 + 1)*a*b*d^2/c^5 + 8/945*(-c^2*x^2 + 1)^(3/2)*b^2*d^2*arcsin(c*x)/c^5 -
1493104/31255875*b^2*d^2*x/c^4 + 8/945*(-c^2*x^2 + 1)^(3/2)*a*b*d^2/c^5 + 1
6/315*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^5 + 16/315*sqrt(-c^2*x^2 + 1
)*a*b*d^2/c^5
```

Mupad [F(-1)]

Timed out.

$$\int x^4 \left(d-c^2 d x^2\right)^2 (a+b \arcsin(cx))^2 \, dx = \int x^4 \left(a+b \operatorname{asin}(c x)\right)^2 \left(d-c^2 d x^2\right)^2 \, dx$$

```
[In] int(x^4*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2,x)
```

```
[Out] int(x^4*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2, x)
```

3.166 $\int x^3(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 27, antiderivative size = 302

$$\int x^3\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2\,dx=-\frac{73b^2d^2x^2}{3072c^2}-\frac{73b^2d^2x^4}{9216}+\frac{43b^2c^2d^2x^6}{3456}-\frac{1}{256}b^2c^4d^2x^8+\frac{73bd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{1536c^3}+\frac{73bd^2x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2304c}-\frac{25}{576}bcd^2x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{1}{32}bcd^2x^5\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))-\frac{73d^2(a+b\arcsin(cx))^2}{3072c^4}+\frac{1}{24}d^2x^4(a+b\arcsin(cx))^2+\frac{1}{12}d^2x^4\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{1}{8}d^2x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2$$

```
[Out] -73/3072*b^2*d^2*x^2/c^2-73/9216*b^2*d^2*x^4+43/3456*b^2*c^2*d^2*x^6-1/256*
b^2*c^4*d^2*x^8-1/32*b*c*d^2*x^5*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))-73/30
72*d^2*(a+b*arcsin(c*x))^2/c^4+1/24*d^2*x^4*(a+b*arcsin(c*x))^2+1/12*d^2*x^
4*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+1/8*d^2*x^4*(-c^2*x^2+1)^2*(a+b*arcsin(c
*x))^2+73/1536*b*d^2*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+73/2304*b*d
^2*x^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c-25/576*b*c*d^2*x^5*(a+b*arcsi
n(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.65 (sec) , antiderivative size = 302, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {4787, 4723, 4795, 4737, 30, 4783, 14}

$$\begin{aligned}\int x^3(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx = &-\frac{73d^2(a+b\arcsin(cx))^2}{3072c^4}\\ &-\frac{1}{32}bcd^2x^5(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\\ &-\frac{25}{576}bcd^2x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))\\ &+\frac{1}{8}d^2x^4(1-c^2x^2)^2(a+b\arcsin(cx))^2\\ &+\frac{1}{12}d^2x^4(1-c^2x^2)(a+b\arcsin(cx))^2\\ &+\frac{73bd^2x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2304c}\\ &+\frac{73bd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{1536c^3}\\ &+\frac{1}{24}d^2x^4(a+b\arcsin(cx))^2-\frac{1}{256}b^2c^4d^2x^8\\ &+\frac{43b^2c^2d^2x^6}{3456}-\frac{73b^2d^2x^2}{3072c^2}-\frac{73b^2d^2x^4}{9216}\end{aligned}$$

```
[In] Int[x^3*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-73*b^2*d^2*x^2)/(3072*c^2) - (73*b^2*d^2*x^4)/9216 + (43*b^2*c^2*d^2*x^6)
/3456 - (b^2*c^4*d^2*x^8)/256 + (73*b*d^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x]))/(1536*c^3) + (73*b*d^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(
2304*c) - (25*b*c*d^2*x^5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/576 - (b*c
*d^2*x^5*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/32 - (73*d^2*(a + b*ArcSi
n[c*x])^2)/(3072*c^4) + (d^2*x^4*(a + b*ArcSin[c*x])^2)/24 + (d^2*x^4*(1 -
c^2*x^2)*(a + b*ArcSin[c*x])^2)/12 + (d^2*x^4*(1 - c^2*x^2)^2*(a + b*ArcSin
[c*x])^2)/8
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{8}d^2x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+\frac{1}{2}d\int x^3\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx \\
&\quad -\frac{1}{4}\left(bcd^2\right)\int x^4\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx \\
&= -\frac{1}{32}bcd^2x^5\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{12}d^2x^4\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{8}d^2x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+\frac{1}{6}d^2\int x^3(a+b\arcsin(cx))^2\,dx \\
&\quad -\frac{1}{32}\left(3bcd^2\right)\int x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx \\
&\quad -\frac{1}{6}\left(bcd^2\right)\int x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx+\frac{1}{32}\left(b^2c^2d^2\right)\int x^5\left(1-c^2x^2\right)\,dx \\
&= -\frac{25}{576}bcd^2x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{1}{32}bcd^2x^5\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) \\
&\quad +\frac{1}{24}d^2x^4(a+b\arcsin(cx))^2+\frac{1}{12}d^2x^4\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{8}d^2x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2-\frac{1}{64}\left(bcd^2\right)\int\frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad -\frac{1}{36}\left(bcd^2\right)\int\frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{12}\left(bcd^2\right)\int\frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad +\frac{1}{64}\left(b^2c^2d^2\right)\int x^5\,dx+\frac{1}{36}\left(b^2c^2d^2\right)\int x^5\,dx+\frac{1}{32}\left(b^2c^2d^2\right)\int\left(x^5-c^2x^7\right)\,dx \\
&= \frac{43b^2c^2d^2x^6}{3456}-\frac{1}{256}b^2c^4d^2x^8+\frac{73bd^2x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2304c} \\
&\quad -\frac{25}{576}bcd^2x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{1}{32}bcd^2x^5\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) \\
&\quad +\frac{1}{24}d^2x^4(a+b\arcsin(cx))^2+\frac{1}{12}d^2x^4\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{8}d^2x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2-\frac{1}{256}\left(b^2d^2\right)\int x^3\,dx \\
&\quad -\frac{1}{144}\left(b^2d^2\right)\int x^3\,dx-\frac{1}{48}\left(b^2d^2\right)\int x^3\,dx-\frac{\left(3bd^2\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{256c} \\
&\quad -\frac{\left(bd^2\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{48c}-\frac{\left(bd^2\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{16c}
\end{aligned}
$$

$$= -\frac{73b^2d^2x^4}{9216} + \frac{43b^2c^2d^2x^6}{3456} - \frac{1}{256}b^2c^4d^2x^8 + \frac{73bd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{1536c^3} + \frac{73bd^2x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2304c} - \frac{25}{576}bcd^2x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{1}{32}bcd^2x^5\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{1}{24}d^2x^4(a+b\arcsin(cx))^2 + \frac{1}{12}d^2x^4\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{1}{8}d^2x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 - \frac{(3bd^2)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{512c^3} - \frac{(bd^2)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{96c^3} - \frac{(bd^2)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{32c^3} - \frac{(3b^2d^2)\int x\,dx}{512c^2} - \frac{(b^2d^2)\int x\,dx}{96c^2} - \frac{(b^2d^2)\int x\,dx}{32c^2}$$

$$= -\frac{73b^2d^2x^2}{3072c^2} - \frac{73b^2d^2x^4}{9216} + \frac{43b^2c^2d^2x^6}{3456} - \frac{1}{256}b^2c^4d^2x^8 + \frac{73bd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{1536c^3} + \frac{73bd^2x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2304c} - \frac{25}{576}bcd^2x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{1}{32}bcd^2x^5\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{73d^2(a+b\arcsin(cx))^2}{3072c^4} + \frac{1}{24}d^2x^4(a+b\arcsin(cx))^2 + \frac{1}{12}d^2x^4\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{1}{8}d^2x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 239, normalized size of antiderivative = 0.79

$$\int x^3\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2\,dx = \frac{d^2\left(cx\left(1152a^2c^3x^3(6-8c^2x^2+3c^4x^4)-b^2cx(657+219c^2x^2-344c^4x^4+108c^6x^6)+6ab\sqrt{1-c^2x^2}(219+\right.\right.}{}$$

```
[In] Integrate[x^3*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(c*x*(1152*a^2*c^3*x^3*(6 - 8*c^2*x^2 + 3*c^4*x^4) - b^2*c*x*(657 + 21
9*c^2*x^2 - 344*c^4*x^4 + 108*c^6*x^6) + 6*a*b*Sqrt[1 - c^2*x^2]*(219 + 146
*c^2*x^2 - 344*c^4*x^4 + 144*c^6*x^6)) + 6*b*(b*c*x*Sqrt[1 - c^2*x^2]*(219
+ 146*c^2*x^2 - 344*c^4*x^4 + 144*c^6*x^6) + 3*a*(-73 + 768*c^4*x^4 - 1024*
c^6*x^6 + 384*c^8*x^8))*ArcSin[c*x] + 9*b^2*(-73 + 768*c^4*x^4 - 1024*c^6*x
^6 + 384*c^8*x^8)*ArcSin[c*x]^2))/(27648*c^4)
```

Maple [A] (verified)

Time = 0.29 (sec) , antiderivative size = 423, normalized size of antiderivative = 1.40

method	result
parts	$d^2a^2\left(\frac{1}{8}c^4x^8-\frac{1}{3}c^2x^6+\frac{1}{4}x^4\right)+\frac{d^2b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^3}{6}+\frac{\arcsin(cx)\left(8c^5x^5\sqrt{-c^2x^2+1}-26c^3x^3\sqrt{-c^2x^2+1}+33\ldots\right.}{144}\ldots\right.}{\ldots}$
derivativedivides	$\frac{d^2a^2\left(\frac{1}{8}c^8x^8-\frac{1}{3}c^6x^6+\frac{1}{4}c^4x^4\right)+d^2b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^3}{6}+\frac{\arcsin(cx)\left(8c^5x^5\sqrt{-c^2x^2+1}-26c^3x^3\sqrt{-c^2x^2+1}+33cx\sqrt{-c^2x^2\ldots}\right.}{144}\ldots\right.}{\ldots}$
default	$\frac{d^2a^2\left(\frac{1}{8}c^8x^8-\frac{1}{3}c^6x^6+\frac{1}{4}c^4x^4\right)+d^2b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^3}{6}+\frac{\arcsin(cx)\left(8c^5x^5\sqrt{-c^2x^2+1}-26c^3x^3\sqrt{-c^2x^2+1}+33cx\sqrt{-c^2x^2\ldots}\right.}{144}\ldots\right.}{\ldots}$

```
[In] int(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] d^2*a^2*(1/8*c^4*x^8-1/3*c^2*x^6+1/4*x^4)+d^2*b^2/c^4*(1/6*arcsin(c*x)^2*(c
^2*x^2-1)^3+1/144*arcsin(c*x)*(8*c^5*x^5*(-c^2*x^2+1)^(1/2)-26*c^3*x^3*(-c^
2*x^2+1)^(1/2)+33*c*x*(-c^2*x^2+1)^(1/2)+15*arcsin(c*x))-55/3072*arcsin(c*x
)^2-11/3456*(c^2*x^2-1)^3+55/9216*(c^2*x^2-1)^2-55/3072*c^2*x^2+55/3072+1/8
*arcsin(c*x)^2*(c^2*x^2-1)^4-1/1536*arcsin(c*x)*(-48*c^7*x^7*(-c^2*x^2+1)^(
1/2)+200*c^5*x^5*(-c^2*x^2+1)^(1/2)-326*c^3*x^3*(-c^2*x^2+1)^(1/2)+279*c*x*
(-c^2*x^2+1)^(1/2)+105*arcsin(c*x))-1/256*(c^2*x^2-1)^4)+2*d^2*a*b/c^4*(1/8
*arcsin(c*x)*c^8*x^8-1/3*arcsin(c*x)*c^6*x^6+1/4*c^4*x^4*arcsin(c*x)+1/64*c
^7*x^7*(-c^2*x^2+1)^(1/2)-43/1152*c^5*x^5*(-c^2*x^2+1)^(1/2)+73/4608*c^3*x^
3*(-c^2*x^2+1)^(1/2)+73/3072*c*x*(-c^2*x^2+1)^(1/2)-73/3072*arcsin(c*x))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 319, normalized size of antiderivative = 1.06

$$\int x^3\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2\,dx$$
$$=\frac{108\,(32\,a^2-b^2)c^8d^2x^8-8\,(1152\,a^2-43\,b^2)c^6d^2x^6+3\,(2304\,a^2-73\,b^2)c^4d^2x^4-657\,b^2c^2d^2x^2+9\,(384\,b^2c\ldots}{\ldots}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/27648*(108*(32*a^2 - b^2)*c^8*d^2*x^8 - 8*(1152*a^2 - 43*b^2)*c^6*d^2*x^6
 + 3*(2304*a^2 - 73*b^2)*c^4*d^2*x^4 - 657*b^2*c^2*d^2*x^2 + 9*(384*b^2*c^8
*d^2*x^8 - 1024*b^2*c^6*d^2*x^6 + 768*b^2*c^4*d^2*x^4 - 73*b^2*d^2)*arcsin(
c*x)^2 + 18*(384*a*b*c^8*d^2*x^8 - 1024*a*b*c^6*d^2*x^6 + 768*a*b*c^4*d^2*x
^4 - 73*a*b*d^2)*arcsin(c*x) + 6*(144*a*b*c^7*d^2*x^7 - 344*a*b*c^5*d^2*x^5
 + 146*a*b*c^3*d^2*x^3 + 219*a*b*c*d^2*x + (144*b^2*c^7*d^2*x^7 - 344*b^2*c
^5*d^2*x^5 + 146*b^2*c^3*d^2*x^3 + 219*b^2*c*d^2*x)*arcsin(c*x))*sqrt(-c^2*
x^2 + 1))/c^4
```

Sympy [A] (verification not implemented)

Time = 1.24 (sec) , antiderivative size = 515, normalized size of antiderivative = 1.71

$$\int x^3(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx$$
$$=\begin{cases}\frac{a^2c^4d^2x^8}{8}-\frac{a^2c^2d^2x^6}{3}+\frac{a^2d^2x^4}{4}+\frac{abc^4d^2x^8\operatorname{asin}(cx)}{4}+\frac{abc^3d^2x^7\sqrt{-c^2x^2+1}}{32}-\frac{2abc^2d^2x^6\operatorname{asin}(cx)}{3}-\frac{43abcd^2x^5\sqrt{-c^2x^2+1}}{576}+\frac{abd^2}{} \\ \frac{a^2d^2x^4}{4}\end{cases}$$

```
[In] integrate(x**3*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**8/8 - a**2*c**2*d**2*x**6/3 + a**2*d**2*x**4/4
 + a*b*c**4*d**2*x**8*asin(c*x)/4 + a*b*c**3*d**2*x**7*sqrt(-c**2*x**2 + 1)
/32 - 2*a*b*c**2*d**2*x**6*asin(c*x)/3 - 43*a*b*c*d**2*x**5*sqrt(-c**2*x**2
 + 1)/576 + a*b*d**2*x**4*asin(c*x)/2 + 73*a*b*d**2*x**3*sqrt(-c**2*x**2 +
1)/(2304*c) + 73*a*b*d**2*x*sqrt(-c**2*x**2 + 1)/(1536*c**3) - 73*a*b*d**2*
asin(c*x)/(1536*c**4) + b**2*c**4*d**2*x**8*asin(c*x)**2/8 - b**2*c**4*d**2
*x**8/256 + b**2*c**3*d**2*x**7*sqrt(-c**2*x**2 + 1)*asin(c*x)/32 - b**2*c*
*2*d**2*x**6*asin(c*x)**2/3 + 43*b**2*c**2*d**2*x**6/3456 - 43*b**2*c*d**2*
x**5*sqrt(-c**2*x**2 + 1)*asin(c*x)/576 + b**2*d**2*x**4*asin(c*x)**2/4 - 7
3*b**2*d**2*x**4/9216 + 73*b**2*d**2*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2
304*c) - 73*b**2*d**2*x**2/(3072*c**2) + 73*b**2*d**2*x*sqrt(-c**2*x**2 + 1
)*asin(c*x)/(1536*c**3) - 73*b**2*d**2*asin(c*x)**2/(3072*c**4), Ne(c, 0)),
 (a**2*d**2*x**4/4, True))
```

Maxima [F]

$$\int x^3(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx=\int(c^2dx^2-d)^2(b\arcsin(cx)+a)^2x^3\,dx$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/8*a^2*c^4*d^2*x^8 - 1/3*a^2*c^2*d^2*x^6 + 1/1536*(384*x^8*arcsin(c*x) + (
48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^
2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c*x)/c^9)*c)
*a*b*c^4*d^2 + 1/4*a^2*d^2*x^4 - 1/72*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^
2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^
6 - 15*arcsin(c*x)/c^7)*c)*a*b*c^2*d^2 + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(
-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*
a*b*d^2 + 1/24*(3*b^2*c^4*d^2*x^8 - 8*b^2*c^2*d^2*x^6 + 6*b^2*d^2*x^4)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + integrate(1/12*(3*b^2*c^5*d^2*x^
8 - 8*b^2*c^3*d^2*x^6 + 6*b^2*c*d^2*x^4)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 522, normalized size of antiderivative = 1.73

$$\int x^3 (d - c^2 d x^2)^2 (a + b \arcsin(cx))^2 \, dx$$
$$= \frac{1}{8} a^2 c^4 d^2 x^8 - \frac{1}{3} a^2 c^2 d^2 x^6 + \frac{1}{4} a^2 d^2 x^4 + \frac{(c^2x^2-1)^3 \sqrt{-c^2x^2+1} b^2 d^2 x \arcsin(cx)}{32 c^3} + \frac{(c^2x^2-1)^4 b^2 d^2 \arcsin(cx)^2}{8 c^4} + \frac{(c^2x^2-1)^3 \sqrt{-c^2x^2+1} abd^2 x}{32 c^3} + \frac{11 (c^2x^2-1)^2 \sqrt{-c^2x^2+1} b^2 d^2 x \arcsin(cx)}{576 c^3} + \frac{(c^2x^2-1)^4 abd^2 \arcsin(cx)}{4 c^4} + \frac{(c^2x^2-1)^3 b^2 d^2 \arcsin(cx)^2}{6 c^4} + \frac{11 (c^2x^2-1)^2 \sqrt{-c^2x^2+1} abd^2 x}{576 c^3} + \frac{55 (-c^2x^2+1)^{\frac{3}{2}} b^2 d^2 x \arcsin(cx)}{2304 c^3} - \frac{(c^2x^2-1)^4 b^2 d^2}{256 c^4} + \frac{(c^2x^2-1)^3 abd^2 \arcsin(cx)}{3 c^4} + \frac{55 (-c^2x^2+1)^{\frac{3}{2}} abd^2 x}{2304 c^3} + \frac{55 \sqrt{-c^2x^2+1} b^2 d^2 x \arcsin(cx)}{1536 c^3} - \frac{11 (c^2x^2-1)^3 b^2 d^2}{3456 c^4} + \frac{55 \sqrt{-c^2x^2+1} abd^2 x}{1536 c^3} + \frac{55 (c^2x^2-1)^2 b^2 d^2}{9216 c^4} + \frac{55 b^2 d^2 \arcsin(cx)^2}{3072 c^4} - \frac{55 (c^2x^2-1) b^2 d^2}{3072 c^4} + \frac{55 abd^2 \arcsin(cx)}{1536 c^4} - \frac{9835 b^2 d^2}{884736 c^4}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/8*a^2*c^4*d^2*x^8 - 1/3*a^2*c^2*d^2*x^6 + 1/4*a^2*d^2*x^4 + 1/32*(c^2*x^2
 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^2*x*arcsin(c*x)/c^3 + 1/8*(c^2*x^2 - 1)^4*
b^2*d^2*arcsin(c*x)^2/c^4 + 1/32*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*d^2
*x/c^3 + 11/576*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^2*x*arcsin(c*x)/c^
3 + 1/4*(c^2*x^2 - 1)^4*a*b*d^2*arcsin(c*x)/c^4 + 1/6*(c^2*x^2 - 1)^3*b^2*d
^2*arcsin(c*x)^2/c^4 + 11/576*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^2*x/
c^3 + 55/2304*(-c^2*x^2 + 1)^(3/2)*b^2*d^2*x*arcsin(c*x)/c^3 - 1/256*(c^2*x
^2 - 1)^4*b^2*d^2/c^4 + 1/3*(c^2*x^2 - 1)^3*a*b*d^2*arcsin(c*x)/c^4 + 55/23
04*(-c^2*x^2 + 1)^(3/2)*a*b*d^2*x/c^3 + 55/1536*sqrt(-c^2*x^2 + 1)*b^2*d^2*
x*arcsin(c*x)/c^3 - 11/3456*(c^2*x^2 - 1)^3*b^2*d^2/c^4 + 55/1536*sqrt(-c^2
*x^2 + 1)*a*b*d^2*x/c^3 + 55/9216*(c^2*x^2 - 1)^2*b^2*d^2/c^4 + 55/3072*b^2
*d^2*arcsin(c*x)^2/c^4 - 55/3072*(c^2*x^2 - 1)*b^2*d^2/c^4 + 55/1536*a*b*d^
2*arcsin(c*x)/c^4 - 9835/884736*b^2*d^2/c^4
```

Mupad [F(-1)]

Timed out.

$$\int x^3 \left(d-c^2 d x^2\right)^2 (a+b \arcsin(cx))^2 \, dx = \int x^3 \, (a+b \, \mathrm{asin}(c \, x))^2 \, \left(d-c^2 \, d \, x^2\right)^2 \, dx$$

```
[In] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2,x)
[Out] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2, x)
```

3.167 $\int x^2(d-c^2dx^2)^2 (a+b\arcsin(cx))^2 dx$

Optimal result

Integrand size = 27, antiderivative size = 310

$$\begin{aligned}\int x^2(d-c^2dx^2)^2 (a+b\arcsin(cx))^2 dx &= -\frac{1636b^2d^2x}{11025c^2} - \frac{818b^2d^2x^3}{33075} \\ &+ \frac{136b^2c^2d^2x^5}{6125} - \frac{2}{343}b^2c^4d^2x^7 + \frac{32bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{315c^3} \\ &+ \frac{16bd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{315c} + \frac{8bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{105c^3} \\ &+ \frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{175c^3} - \frac{2bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c^3} \\ &+ \frac{8}{105}d^2x^3(a+b\arcsin(cx))^2 + \frac{4}{35}d^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{1}{7}d^2x^3(1-c^2x^2)^2(a+b\arcsin(cx))^2\end{aligned}$$

```
[Out] -1636/11025*b^2*d^2*x/c^2-818/33075*b^2*d^2*x^3+136/6125*b^2*c^2*d^2*x^5-2/
343*b^2*c^4*d^2*x^7+8/105*b*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c^3+2/
175*b*d^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))/c^3-2/49*b*d^2*(-c^2*x^2+1)^
(7/2)*(a+b*arcsin(c*x))/c^3+8/105*d^2*x^3*(a+b*arcsin(c*x))^2+4/35*d^2*x^3*
(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+1/7*d^2*x^3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x
))^2+32/315*b*d^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+16/315*b*d^2*x^2
*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 310, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.407, Rules used = {4787, 4723, 4795, 4767, 8, 30, 272, 45, 4779, 12, 380}

$$\int x^2\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2\,dx$$
$$=\frac{16bd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{315c}+\frac{1}{7}d^2x^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2$$
$$+\frac{4}{35}d^2x^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2$$
$$-\frac{2bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c^3}+\frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{175c^3}$$
$$+\frac{8bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{105c^3}+\frac{32bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{315c^3}$$
$$+\frac{8}{105}d^2x^3(a+b\arcsin(cx))^2-\frac{2}{343}b^2c^4d^2x^7+\frac{136b^2c^2d^2x^5}{6125}-\frac{1636b^2d^2x}{11025c^2}-\frac{818b^2d^2x^3}{33075}$$

```
[In] Int[x^2*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-1636*b^2*d^2*x)/(11025*c^2) - (818*b^2*d^2*x^3)/33075 + (136*b^2*c^2*d^2*
x^5)/6125 - (2*b^2*c^4*d^2*x^7)/343 + (32*b*d^2*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x]))/(315*c^3) + (16*b*d^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/(315*c) + (8*b*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(105*c^3) + (
2*b*d^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(175*c^3) - (2*b*d^2*(1 -
c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(49*c^3) + (8*d^2*x^3*(a + b*ArcSin[c*x
])^2)/105 + (4*d^2*x^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/35 + (d^2*x^3*(
1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/7
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 380

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
```

```
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{7}d^2x^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+\frac{1}{7}(4d)\int x^2\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx\\
&\quad-\frac{1}{7}\left(2bcd^2\right)\int x^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx\\
&=\frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{35c^3}-\frac{2bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c^3}\\
&\quad+\frac{4}{35}d^2x^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2\\
&\quad+\frac{1}{7}d^2x^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+\frac{1}{35}\left(8d^2\right)\int x^2(a+b\arcsin(cx))^2\,dx\\
&\quad-\frac{1}{35}\left(8bcd^2\right)\int x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx\\
&\quad+\frac{1}{7}\left(2b^2c^2d^2\right)\int\frac{(-2-5c^2x^2)\left(1-c^2x^2\right)^2}{35c^4}\,dx\\
&=\frac{8bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{105c^3}\\
&\quad+\frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{175c^3}-\frac{2bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c^3}\\
&\quad+\frac{8}{105}d^2x^3(a+b\arcsin(cx))^2+\frac{4}{35}d^2x^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{1}{7}d^2x^3\left(1-c^2x^2\right)^2(a+b\arcsin(c\\
&=\frac{16bd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{315c}+\frac{8bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{105c^3}\\
&\quad+\frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{175c^3}-\frac{2bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c^3}\\
&\quad+\frac{8}{105}d^2x^3(a+b\arcsin(cx))^2+\frac{4}{35}d^2x^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{1}{7}d^2x^3\left(1-c^2x^2\right)^2(a+b\arcsin(c
\end{aligned}$$

$$= -\frac{172b^2d^2x}{3675c^2} - \frac{818b^2d^2x^3}{33075} + \frac{136b^2c^2d^2x^5}{6125} - \frac{2}{343}b^2c^4d^2x^7 + \frac{32bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{315c^3} + \frac{16bd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{315c} + \frac{8bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{105c^3} + \frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{175c^3} - \frac{2bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c^3} + \frac{8}{105}d^2x^3(a+b\arcsin(cx))^2 + \frac{4}{35}d^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{1}{7}d^2x^3(1-c^2x^2)^2(a+b\arcsin($$

$$= -\frac{1636b^2d^2x}{11025c^2} - \frac{818b^2d^2x^3}{33075} + \frac{136b^2c^2d^2x^5}{6125} - \frac{2}{343}b^2c^4d^2x^7 + \frac{32bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{315c^3} + \frac{16bd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{315c} + \frac{8bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{105c^3} + \frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{175c^3} - \frac{2bd^2(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c^3} + \frac{8}{105}d^2x^3(a+b\arcsin(cx))^2 + \frac{4}{35}d^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{1}{7}d^2x^3(1-c^2x^2)^2(a+b\arcsin($$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 229, normalized size of antiderivative = 0.74

$$\int x^2(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx$$

$$= \frac{d^2\left(11025a^2c^3x^3(35-42c^2x^2+15c^4x^4)+210ab\sqrt{1-c^2x^2}(818+409c^2x^2-612c^4x^4+225c^6x^6)-2b^2cx(\right.}{}$$

```
[In] Integrate[x^2*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(11025*a^2*c^3*x^3*(35 - 42*c^2*x^2 + 15*c^4*x^4) + 210*a*b*Sqrt[1 - c
^2*x^2]*(818 + 409*c^2*x^2 - 612*c^4*x^4 + 225*c^6*x^6) - 2*b^2*c*x*(85890
+ 14315*c^2*x^2 - 12852*c^4*x^4 + 3375*c^6*x^6) + 210*b*(105*a*c^3*x^3*(35
- 42*c^2*x^2 + 15*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(818 + 409*c^2*x^2 - 612*c
^4*x^4 + 225*c^6*x^6))*ArcSin[c*x] + 11025*b^2*c^3*x^3*(35 - 42*c^2*x^2 + 1
5*c^4*x^4)*ArcSin[c*x]^2))/(1157625*c^3)
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 399, normalized size of antiderivative = 1.29

method	result
parts	$d^2a^2\left(\frac{1}{7}c^4x^7-\frac{2}{5}c^2x^5+\frac{1}{3}x^3\right)+\frac{d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{175}-\frac{2(3c^4}{}\right.}{}$
derivativedivides	$\frac{d^2a^2\left(\frac{1}{7}c^7x^7-\frac{2}{5}c^5x^5+\frac{1}{3}c^3x^3\right)+d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{175}-\frac{2\left(3c^4x^4-10c^2x^2\right.}{2625}\right.}{}$
default	$\frac{d^2a^2\left(\frac{1}{7}c^7x^7-\frac{2}{5}c^5x^5+\frac{1}{3}c^3x^3\right)+d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{175}-\frac{2\left(3c^4x^4-10c^2x^2\right.}{2625}\right.}{}$

```
[In] int(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] d^2*a^2*(1/7*c^4*x^7-2/5*c^2*x^5+1/3*x^3)+d^2*b^2/c^3*(1/15*arcsin(c*x)^2*(
3*c^4*x^4-10*c^2*x^2+15)*c*x+2/175*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(
1/2)-2/2625*(3*c^4*x^4-10*c^2*x^2+15)*c*x-8/315*arcsin(c*x)*(c^2*x^2-1)*(-c
^2*x^2+1)^(1/2)+8/945*(c^2*x^2-3)*c*x-16/105*c*x+16/105*arcsin(c*x)*(-c^2*x
^2+1)^(1/2)+1/35*arcsin(c*x)^2*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x+2/4
9*arcsin(c*x)*(c^2*x^2-1)^3*(-c^2*x^2+1)^(1/2)-2/1715*(5*c^6*x^6-21*c^4*x^4
+35*c^2*x^2-35)*c*x)+2*d^2*a*b/c^3*(1/7*arcsin(c*x)*c^7*x^7-2/5*arcsin(c*x)
*c^5*x^5+1/3*c^3*x^3*arcsin(c*x)+1/49*c^6*x^6*(-c^2*x^2+1)^(1/2)-68/1225*c^
4*x^4*(-c^2*x^2+1)^(1/2)+409/11025*c^2*x^2*(-c^2*x^2+1)^(1/2)+818/11025*(-c
^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 296, normalized size of antiderivative = 0.95

$$\int x^2\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2\,dx$$
$$=\frac{3375\,(49\,a^2-2\,b^2)c^7d^2x^7-378\,(1225\,a^2-68\,b^2)c^5d^2x^5+35\,(11025\,a^2-818\,b^2)c^3d^2x^3-171780\,b^2cd^2x+}{}$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/1157625*(3375*(49*a^2 - 2*b^2)*c^7*d^2*x^7 - 378*(1225*a^2 - 68*b^2)*c^5*
d^2*x^5 + 35*(11025*a^2 - 818*b^2)*c^3*d^2*x^3 - 171780*b^2*c*d^2*x + 11025
*(15*b^2*c^7*d^2*x^7 - 42*b^2*c^5*d^2*x^5 + 35*b^2*c^3*d^2*x^3)*arcsin(c*x)
^2 + 22050*(15*a*b*c^7*d^2*x^7 - 42*a*b*c^5*d^2*x^5 + 35*a*b*c^3*d^2*x^3)*a
rcsin(c*x) + 210*(225*a*b*c^6*d^2*x^6 - 612*a*b*c^4*d^2*x^4 + 409*a*b*c^2*d
^2*x^2 + 818*a*b*d^2 + (225*b^2*c^6*d^2*x^6 - 612*b^2*c^4*d^2*x^4 + 409*b^2
*c^2*d^2*x^2 + 818*b^2*d^2)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A] (verification not implemented)

Time = 0.90 (sec) , antiderivative size = 483, normalized size of antiderivative = 1.56

$$\int x^2(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx$$

$$= \begin{cases} \frac{a^2c^4d^2x^7}{7} - \frac{2a^2c^2d^2x^5}{5} + \frac{a^2d^2x^3}{3} + \frac{2abc^4d^2x^7\operatorname{asin}(cx)}{7} + \frac{2abc^3d^2x^6\sqrt{-c^2x^2+1}}{49} - \frac{4abc^2d^2x^5\operatorname{asin}(cx)}{5} - \frac{136abcd^2x^4\sqrt{-c^2x^2+1}}{1225} + \\ \frac{a^2d^2x^3}{3} \end{cases}$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**7/7 - 2*a**2*c**2*d**2*x**5/5 + a**2*d**2*x**3
/3 + 2*a*b*c**4*d**2*x**7*asin(c*x)/7 + 2*a*b*c**3*d**2*x**6*sqrt(-c**2*x**
2 + 1)/49 - 4*a*b*c**2*d**2*x**5*asin(c*x)/5 - 136*a*b*c*d**2*x**4*sqrt(-c*
*2*x**2 + 1)/1225 + 2*a*b*d**2*x**3*asin(c*x)/3 + 818*a*b*d**2*x**2*sqrt(-c
**2*x**2 + 1)/(11025*c) + 1636*a*b*d**2*sqrt(-c**2*x**2 + 1)/(11025*c**3) +
 b**2*c**4*d**2*x**7*asin(c*x)**2/7 - 2*b**2*c**4*d**2*x**7/343 + 2*b**2*c*
*3*d**2*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x)/49 - 2*b**2*c**2*d**2*x**5*asin
(c*x)**2/5 + 136*b**2*c**2*d**2*x**5/6125 - 136*b**2*c*d**2*x**4*sqrt(-c**2
*x**2 + 1)*asin(c*x)/1225 + b**2*d**2*x**3*asin(c*x)**2/3 - 818*b**2*d**2*x
**3/33075 + 818*b**2*d**2*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(11025*c) - 1
636*b**2*d**2*x/(11025*c**2) + 1636*b**2*d**2*sqrt(-c**2*x**2 + 1)*asin(c*x
)/(11025*c**3), Ne(c, 0)), (a**2*d**2*x**3/3, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 634 vs. 2(274) = 548.

Time = 0.31 (sec) , antiderivative size = 634, normalized size of antiderivative = 2.05

$$\int x^2(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx$$
$$= \frac{1}{7}b^2c^4d^2x^7\arcsin(cx)^2 + \frac{1}{7}a^2c^4d^2x^7 - \frac{2}{5}b^2c^2d^2x^5\arcsin(cx)^2 - \frac{2}{5}a^2c^2d^2x^5$$
$$+\frac{2}{245}\left(35\,x^7\arcsin(cx) + \left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2} + \frac{6\sqrt{-c^2x^2+1}x^4}{c^4} + \frac{8\sqrt{-c^2x^2+1}x^2}{c^6} + \frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right.$$
$$+\frac{2}{25725}\left(105\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2} + \frac{6\sqrt{-c^2x^2+1}x^4}{c^4} + \frac{8\sqrt{-c^2x^2+1}x^2}{c^6} + \frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\arcsin(cx) - \right.$$
$$+\frac{1}{3}b^2d^2x^3\arcsin(cx)^2$$
$$-\frac{4}{75}\left(15\,x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abc^2d^2$$
$$-\frac{4}{1125}\left(15\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\arcsin(cx) - \frac{9\,c^4x^5+20\,c^2x^3+120}{c^4}\right.$$
$$+\frac{1}{3}a^2d^2x^3 + \frac{2}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abd^2$$
$$+\frac{2}{27}\left(3\,c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\arcsin(cx) - \frac{c^2x^3+6\,x}{c^2}\right)b^2d^2$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/7*b^2*c^4*d^2*x^7*arcsin(c*x)^2 + 1/7*a^2*c^4*d^2*x^7 - 2/5*b^2*c^2*d^2*x
^5*arcsin(c*x)^2 - 2/5*a^2*c^2*d^2*x^5 + 2/245*(35*x^7*arcsin(c*x) + (5*sqr
t(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 +
1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^4*d^2 + 2/25725*(105*(5*sq
rt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 +
 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7 + 126*
c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2*c^4*d^2 + 1/3*b^2*d^2*x^3*arcsin(c
*x)^2 - 4/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-
c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^2*d^2 - 4/1125*(1
5*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^
2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*c
^2*d^2 + 1/3*a^2*d^2*x^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x
^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d^2 + 2/27*(3*c*(sqrt(-c^2*x^2 + 1)
*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*b^2
*d^2
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 553 vs. 2(274) = 548.

Time = 0.34 (sec) , antiderivative size = 553, normalized size of antiderivative = 1.78

$$\int x^2 (d-c^2dx^2)^2 (a+b\arcsin(cx))^2 \, dx = \frac{1}{7}a^2c^4d^2x^7 - \frac{2}{5}a^2c^2d^2x^5 + \frac{(c^2x^2-1)^3b^2d^2x\arcsin(cx)^2}{7c^2} + \frac{1}{3}a^2d^2x^3 + \frac{2(c^2x^2-1)^3abd^2x\arcsin(cx)}{7c^2} + \frac{(c^2x^2-1)^2b^2d^2x\arcsin(cx)^2}{35c^2} - \frac{2(c^2x^2-1)^3b^2d^2x}{343c^2} + \frac{2(c^2x^2-1)^2abd^2x\arcsin(cx)}{35c^2} - \frac{4(c^2x^2-1)b^2d^2x\arcsin(cx)^2}{105c^2} + \frac{2(c^2x^2-1)^3\sqrt{-c^2x^2+1}b^2d^2\arcsin(cx)}{49c^3} + \frac{202(c^2x^2-1)^2b^2d^2x}{42875c^2} - \frac{8(c^2x^2-1)abd^2x\arcsin(cx)}{105c^2} + \frac{8b^2d^2x\arcsin(cx)^2}{105c^2} + \frac{2(c^2x^2-1)^3\sqrt{-c^2x^2+1}abd^2}{49c^3} + \frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}b^2d^2\arcsin(cx)}{175c^3} + \frac{2528(c^2x^2-1)b^2d^2x}{1157625c^2} + \frac{16abd^2x\arcsin(cx)}{105c^2} + \frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}abd^2}{175c^3} + \frac{8(-c^2x^2+1)^{\frac{3}{2}}b^2d^2\arcsin(cx)}{315c^3} - \frac{181456b^2d^2x}{1157625c^2} + \frac{8(-c^2x^2+1)^{\frac{3}{2}}abd^2}{315c^3} + \frac{16\sqrt{-c^2x^2+1}b^2d^2\arcsin(cx)}{105c^3} + \frac{16\sqrt{-c^2x^2+1}abd^2}{105c^3}$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/7*a^2*c^4*d^2*x^7 - 2/5*a^2*c^2*d^2*x^5 + 1/7*(c^2*x^2 - 1)^3*b^2*d^2*x*a
rcsin(c*x)^2/c^2 + 1/3*a^2*d^2*x^3 + 2/7*(c^2*x^2 - 1)^3*a*b*d^2*x*arcsin(c
*x)/c^2 + 1/35*(c^2*x^2 - 1)^2*b^2*d^2*x*arcsin(c*x)^2/c^2 - 2/343*(c^2*x^2
 - 1)^3*b^2*d^2*x/c^2 + 2/35*(c^2*x^2 - 1)^2*a*b*d^2*x*arcsin(c*x)/c^2 - 4/
105*(c^2*x^2 - 1)*b^2*d^2*x*arcsin(c*x)^2/c^2 + 2/49*(c^2*x^2 - 1)^3*sqrt(-
c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^3 + 202/42875*(c^2*x^2 - 1)^2*b^2*d^2*x/
c^2 - 8/105*(c^2*x^2 - 1)*a*b*d^2*x*arcsin(c*x)/c^2 + 8/105*b^2*d^2*x*arcsi
n(c*x)^2/c^2 + 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*d^2/c^3 + 2/175*
(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^3 + 2528/1157625*(
c^2*x^2 - 1)*b^2*d^2*x/c^2 + 16/105*a*b*d^2*x*arcsin(c*x)/c^2 + 2/175*(c^2*
x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^2/c^3 + 8/315*(-c^2*x^2 + 1)^(3/2)*b^2*
d^2*arcsin(c*x)/c^3 - 181456/1157625*b^2*d^2*x/c^2 + 8/315*(-c^2*x^2 + 1)^(
3/2)*a*b*d^2/c^3 + 16/105*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c^3 + 16/1
05*sqrt(-c^2*x^2 + 1)*a*b*d^2/c^3
```

Mupad [F(-1)]

Timed out.

$$\int x^2 \left(d-c^2 d x^2\right)^2 (a+b \arcsin(cx))^2 \, dx = \int x^2 \left(a+b \,\mathrm{asin}(c\,x)\right)^2 \left(d-c^2\,d\,x^2\right)^2 \,dx$$

```
[In] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2,x)
```

```
[Out] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2, x)
```

3.168 $\int x(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 25, antiderivative size = 209

$$\int x(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx=-\frac{25}{288}b^2d^2x^2+\frac{5}{288}b^2c^2d^2x^4+\frac{b^2d^2(1-c^2x^2)^3}{108c^2}+\frac{5bd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{48c}+\frac{5bd^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{72c}+\frac{bd^2x(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{18c}+\frac{5d^2(a+b\arcsin(cx))^2}{96c^2}-\frac{d^2(1-c^2x^2)^3(a+b\arcsin(cx))^2}{6c^2}$$

```
[Out] -25/288*b^2*d^2*x^2+5/288*b^2*c^2*d^2*x^4+1/108*b^2*d^2*(-c^2*x^2+1)^3/c^2+
5/72*b*d^2*x*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c+1/18*b*d^2*x*(-c^2*x^2+
1)^(5/2)*(a+b*arcsin(c*x))/c+5/96*d^2*(a+b*arcsin(c*x))^2/c^2-1/6*d^2*(-c^2
*x^2+1)^3*(a+b*arcsin(c*x))^2/c^2+5/48*b*d^2*x*(a+b*arcsin(c*x))*(-c^2*x^2+
1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 209, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {4767, 4743, 4741, 4737, 30, 14, 267}

$$\int x(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx=\frac{bd^2x(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{18c}+\frac{5bd^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{72c}+\frac{5bd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{48c}-\frac{d^2(1-c^2x^2)^3(a+b\arcsin(cx))^2}{6c^2}+\frac{5d^2(a+b\arcsin(cx))^2}{96c^2}+\frac{5}{288}b^2c^2d^2x^4+\frac{b^2d^2(1-c^2x^2)^3}{108c^2}-\frac{25}{288}b^2d^2x^2$$

```
[In] Int[x*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-25*b^2*d^2*x^2)/288 + (5*b^2*c^2*d^2*x^4)/288 + (b^2*d^2*(1 - c^2*x^2)^3)
/(108*c^2) + (5*b*d^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(48*c) + (5*
b*d^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(72*c) + (b*d^2*x*(1 - c^2
*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(18*c) + (5*d^2*(a + b*ArcSin[c*x])^2)/(96
*c^2) - (d^2*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(6*c^2)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^2(1-c^2x^2)^3\,(a+b\arcsin(cx))^2}{6c^2}+\frac{(bd^2)\int(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))\,dx}{3c}\\
&= \frac{bd^2x(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}{18c}-\frac{d^2(1-c^2x^2)^3\,(a+b\arcsin(cx))^2}{6c^2}\\
&\quad -\frac{1}{18}(b^2d^2)\int x\left(1-c^2x^2\right)^2\,dx+\frac{(5bd^2)\int(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\,dx}{18c}
\end{aligned}$$

$$= \frac{b^2d^2(1-c^2x^2)^3}{108c^2} + \frac{5bd^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{72c} + \frac{bd^2x(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{18c} - \frac{d^2(1-c^2x^2)^3(a+b\arcsin(cx))^2}{6c^2} - \frac{1}{72}(5b^2d^2)\int x(1-c^2x^2)\,dx + \frac{(5bd^2)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{24c}$$

$$= \frac{b^2d^2(1-c^2x^2)^3}{108c^2} + \frac{5bd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{48c} + \frac{5bd^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{72c} + \frac{bd^2x(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{18c} - \frac{d^2(1-c^2x^2)^3(a+b\arcsin(cx))^2}{6c^2} - \frac{1}{72}(5b^2d^2)\int(x-c^2x^3)\,dx - \frac{1}{48}(5b^2d^2)\int x\,dx + \frac{(5bd^2)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{48c}$$

$$= -\frac{25}{288}b^2d^2x^2 + \frac{5}{288}b^2c^2d^2x^4 + \frac{b^2d^2(1-c^2x^2)^3}{108c^2} + \frac{5bd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{48c} + \frac{5bd^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{72c} + \frac{bd^2x(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{18c} + \frac{5d^2(a+b\arcsin(cx))^2}{96c^2} - \frac{d^2(1-c^2x^2)^3(a+b\arcsin(cx))^2}{6c^2}$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.04

$$\int x(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx = \frac{d^2(b^2c^2x^2(-99+39c^2x^2-8c^4x^4)+6abcx\sqrt{1-c^2x^2}(33-26c^2x^2+8c^4x^4)+9a^2(-11+48c^2x^2-48c^4x^4}{}$$

```
[In] Integrate[x*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(b^2*c^2*x^2*(-99 + 39*c^2*x^2 - 8*c^4*x^4) + 6*a*b*c*x*Sqrt[1 - c^2*x
^2]*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 9*a^2*(-11 + 48*c^2*x^2 - 48*c^4*x^4 +
16*c^6*x^6) + 6*b*(b*c*x*Sqrt[1 - c^2*x^2]*(33 - 26*c^2*x^2 + 8*c^4*x^4) +
3*a*(-11 + 48*c^2*x^2 - 48*c^4*x^4 + 16*c^6*x^6))*ArcSin[c*x] + 9*b^2*(-11
+ 48*c^2*x^2 - 48*c^4*x^4 + 16*c^6*x^6)*ArcSin[c*x]^2))/(864*c^2)
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.29

method	result
derivativedivides	$\frac{\frac{d^2a^2\left(c^2x^2-1\right)^3}{6}+d^2b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^3}{6}+\frac{\arcsin(cx)\left(8c^5x^5\sqrt{-c^2x^2+1}-26c^3x^3\sqrt{-c^2x^2+1}+33cx\sqrt{-c^2x^2+1}+15\arcsin(c\right.}{144}\right.}{}$
default	$\frac{\frac{d^2a^2\left(c^2x^2-1\right)^3}{6}+d^2b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^3}{6}+\frac{\arcsin(cx)\left(8c^5x^5\sqrt{-c^2x^2+1}-26c^3x^3\sqrt{-c^2x^2+1}+33cx\sqrt{-c^2x^2+1}+15\arcsin(c\right.}{144}\right.}{}$
parts	$\frac{d^2a^2\left(c^2x^2-1\right)^3}{6c^2}+\frac{d^2b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^3}{6}+\frac{\arcsin(cx)\left(8c^5x^5\sqrt{-c^2x^2+1}-26c^3x^3\sqrt{-c^2x^2+1}+33cx\sqrt{-c^2x^2+1}+15\arcsin\right.}{144}\right.}{c^2}$

```
[In] int(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(1/6*d^2*a^2*(c^2*x^2-1)^3+d^2*b^2*(1/6*arcsin(c*x)^2*(c^2*x^2-1)^3+1
/144*arcsin(c*x)*(8*c^5*x^5*(-c^2*x^2+1)^(1/2)-26*c^3*x^3*(-c^2*x^2+1)^(1/2
)+33*c*x*(-c^2*x^2+1)^(1/2)+15*arcsin(c*x))-5/96*arcsin(c*x)^2-1/108*(c^2*x
^2-1)^3+5/288*(c^2*x^2-1)^2-5/96*c^2*x^2+5/96)+2*d^2*a*b*(1/6*arcsin(c*x)*c
^6*x^6-1/2*c^4*x^4*arcsin(c*x)+1/2*c^2*x^2*arcsin(c*x)-11/96*arcsin(c*x)+1/
36*c^5*x^5*(-c^2*x^2+1)^(1/2)-13/144*c^3*x^3*(-c^2*x^2+1)^(1/2)+11/96*c*x*(
-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.33

$$\int x\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2\,dx$$
$$=\frac{8\,(18\,a^2-b^2)c^6d^2x^6-3\,(144\,a^2-13\,b^2)c^4d^2x^4+9\,(48\,a^2-11\,b^2)c^2d^2x^2+9\,(16\,b^2c^6d^2x^6-48\,b^2c^4d^2x^4+}{}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/864*(8*(18*a^2 - b^2)*c^6*d^2*x^6 - 3*(144*a^2 - 13*b^2)*c^4*d^2*x^4 + 9*
(48*a^2 - 11*b^2)*c^2*d^2*x^2 + 9*(16*b^2*c^6*d^2*x^6 - 48*b^2*c^4*d^2*x^4
+ 48*b^2*c^2*d^2*x^2 - 11*b^2*d^2)*arcsin(c*x)^2 + 18*(16*a*b*c^6*d^2*x^6 -
 48*a*b*c^4*d^2*x^4 + 48*a*b*c^2*d^2*x^2 - 11*a*b*d^2)*arcsin(c*x) + 6*(8*a
*b*c^5*d^2*x^5 - 26*a*b*c^3*d^2*x^3 + 33*a*b*c*d^2*x + (8*b^2*c^5*d^2*x^5 -
 26*b^2*c^3*d^2*x^3 + 33*b^2*c*d^2*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 430 vs. 2(196) = 392.

Time = 0.69 (sec) , antiderivative size = 430, normalized size of antiderivative = 2.06

$$\int x(d-c^2dx^2)^2 (a+b\arcsin(cx))^2\,dx$$
$$=\begin{cases}\frac{a^2c^4d^2x^6}{6}-\frac{a^2c^2d^2x^4}{2}+\frac{a^2d^2x^2}{2}+\frac{abc^4d^2x^6\operatorname{asin}(cx)}{3}+\frac{abc^3d^2x^5\sqrt{-c^2x^2+1}}{18}-abc^2d^2x^4\operatorname{asin}(cx)-\frac{13abcd^2x^3\sqrt{-c^2x^2+1}}{72}+ \\ \frac{a^2d^2x^2}{2}\end{cases}$$

```
[In] integrate(x*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**6/6 - a**2*c**2*d**2*x**4/2 + a**2*d**2*x**2/2
 + a*b*c**4*d**2*x**6*asin(c*x)/3 + a*b*c**3*d**2*x**5*sqrt(-c**2*x**2 + 1)
/18 - a*b*c**2*d**2*x**4*asin(c*x) - 13*a*b*c*d**2*x**3*sqrt(-c**2*x**2 + 1
)/72 + a*b*d**2*x**2*asin(c*x) + 11*a*b*d**2*x*sqrt(-c**2*x**2 + 1)/(48*c)
- 11*a*b*d**2*asin(c*x)/(48*c**2) + b**2*c**4*d**2*x**6*asin(c*x)**2/6 - b*
*2*c**4*d**2*x**6/108 + b**2*c**3*d**2*x**5*sqrt(-c**2*x**2 + 1)*asin(c*x)/
18 - b**2*c**2*d**2*x**4*asin(c*x)**2/2 + 13*b**2*c**2*d**2*x**4/288 - 13*b
**2*c*d**2*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/72 + b**2*d**2*x**2*asin(c*x
)**2/2 - 11*b**2*d**2*x**2/96 + 11*b**2*d**2*x*sqrt(-c**2*x**2 + 1)*asin(c*
x)/(48*c) - 11*b**2*d**2*asin(c*x)**2/(96*c**2), Ne(c, 0)), (a**2*d**2*x**2
/2, True))
```

Maxima [F]

$$\int x(d-c^2dx^2)^2 (a+b\arcsin(cx))^2\,dx=\int (c^2dx^2-d)^2(b\arcsin(cx)+a)^2x\,dx$$

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/6*a^2*c^4*d^2*x^6 - 1/2*a^2*c^2*d^2*x^4 + 1/144*(48*x^6*arcsin(c*x) + (8*
sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x
^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*a*b*c^4*d^2 - 1/8*(8*x^4*arcsin(c*x)
 + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*
x)/c^5)*c)*a*b*c^2*d^2 + 1/2*a^2*d^2*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt
(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*d^2 + 1/6*(b^2*c^4*d^2*x^6 - 3
*b^2*c^2*d^2*x^4 + 3*b^2*d^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
)^2 + integrate(1/3*(b^2*c^5*d^2*x^6 - 3*b^2*c^3*d^2*x^4 + 3*b^2*c*d^2*x^2)
*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c
^2*x^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 383 vs. $2(185) = 370$.

Time = 0.32 (sec) , antiderivative size = 383, normalized size of antiderivative = 1.83

$$\int x(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx = \frac{1}{6}a^2c^4d^2x^6 - \frac{1}{2}a^2c^2d^2x^4 + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}b^2d^2x\arcsin(cx)}{18c} + \frac{(c^2x^2-1)^3b^2d^2\arcsin(cx)^2}{6c^2} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}abd^2x}{18c} + \frac{5(-c^2x^2+1)^{\frac{3}{2}}b^2d^2x\arcsin(cx)}{72c} + \frac{(c^2x^2-1)^3abd^2\arcsin(cx)}{3c^2} + \frac{5(-c^2x^2+1)^{\frac{3}{2}}abd^2x}{72c} + \frac{5\sqrt{-c^2x^2+1}b^2d^2x\arcsin(cx)}{48c} - \frac{(c^2x^2-1)^3b^2d^2}{108c^2} + \frac{5\sqrt{-c^2x^2+1}abd^2x}{48c} + \frac{5(c^2x^2-1)^2b^2d^2}{288c^2} + \frac{5b^2d^2\arcsin(cx)^2}{96c^2} + \frac{(c^2x^2-1)a^2d^2}{2c^2} - \frac{5(c^2x^2-1)b^2d^2}{96c^2} + \frac{5abd^2\arcsin(cx)}{48c^2} - \frac{245b^2d^2}{6912c^2}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/6*a^2*c^4*d^2*x^6 - 1/2*a^2*c^2*d^2*x^4 + 1/18*(c^2*x^2 - 1)^2*sqrt(-c^2*
x^2 + 1)*b^2*d^2*x*arcsin(c*x)/c + 1/6*(c^2*x^2 - 1)^3*b^2*d^2*arcsin(c*x)^
2/c^2 + 1/18*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^2*x/c + 5/72*(-c^2*x^
2 + 1)^(3/2)*b^2*d^2*x*arcsin(c*x)/c + 1/3*(c^2*x^2 - 1)^3*a*b*d^2*arcsin(c
*x)/c^2 + 5/72*(-c^2*x^2 + 1)^(3/2)*a*b*d^2*x/c + 5/48*sqrt(-c^2*x^2 + 1)*b
^2*d^2*x*arcsin(c*x)/c - 1/108*(c^2*x^2 - 1)^3*b^2*d^2/c^2 + 5/48*sqrt(-c^2
*x^2 + 1)*a*b*d^2*x/c + 5/288*(c^2*x^2 - 1)^2*b^2*d^2/c^2 + 5/96*b^2*d^2*ar
csin(c*x)^2/c^2 + 1/2*(c^2*x^2 - 1)*a^2*d^2/c^2 - 5/96*(c^2*x^2 - 1)*b^2*d^
2/c^2 + 5/48*a*b*d^2*arcsin(c*x)/c^2 - 245/6912*b^2*d^2/c^2
```

Mupad [F(-1)]

Timed out.

$$\int x(d-c^2dx^2)^2 (a+b\arcsin(cx))^2 \, dx = \int x\,(a+b\,\mathrm{asin}(c\,x))^2 \left(d-c^2\,d\,x^2\right)^2 dx$$

```
[In] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2,x)
[Out] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2, x)
```

3.169 $\int \left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 24, antiderivative size = 219

$$\begin{aligned}\int \left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))^2\,dx = & -\frac{298}{225}b^2d^2x+\frac{76}{675}b^2c^2d^2x^3-\frac{2}{125}b^2c^4d^2x^5 \\ & +\frac{16bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{15c} \\ & +\frac{8bd^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))}{45c} \\ & +\frac{2bd^2\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{25c} \\ & +\frac{8}{15}d^2x(a+b\arcsin(cx))^2 \\ & +\frac{4}{15}d^2x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\ & +\frac{1}{5}d^2x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2\end{aligned}$$

```
[Out] -298/225*b^2*d^2*x+76/675*b^2*c^2*d^2*x^3-2/125*b^2*c^4*d^2*x^5+8/45*b*d^2*
(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c+2/25*b*d^2*(-c^2*x^2+1)^(5/2)*(a+b*a
rcsin(c*x))/c+8/15*d^2*x*(a+b*arcsin(c*x))^2+4/15*d^2*x*(-c^2*x^2+1)*(a+b*a
rcsin(c*x))^2+1/5*d^2*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2+16/15*b*d^2*(a+b
*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 219, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4743, 4715, 4767, 8, 200}

$$\int \left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))^2 \, dx = \frac{1}{5}d^2x\left(1-c^2x^2\right)^2 (a+b\arcsin(cx))^2 + \frac{4}{15}d^2x\left(1-c^2x^2\right) (a+b\arcsin(cx))^2 + \frac{2bd^2\left(1-c^2x^2\right)^{5/2} (a+b\arcsin(cx))}{25c} + \frac{8bd^2\left(1-c^2x^2\right)^{3/2} (a+b\arcsin(cx))}{45c} + \frac{16bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{15c} + \frac{8}{15}d^2x(a+b\arcsin(cx))^2 - \frac{2}{125}b^2c^4d^2x^5 + \frac{76}{675}b^2c^2d^2x^3 - \frac{298}{225}b^2d^2x$$

```
[In] Int[(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-298*b^2*d^2*x)/225 + (76*b^2*c^2*d^2*x^3)/675 - (2*b^2*c^4*d^2*x^5)/125 +
 (16*b*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(15*c) + (8*b*d^2*(1 - c^
2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(45*c) + (2*b*d^2*(1 - c^2*x^2)^(5/2)*(a
+ b*ArcSin[c*x]))/(25*c) + (8*d^2*x*(a + b*ArcSin[c*x])^2)/15 + (4*d^2*x*(1
 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/15 + (d^2*x*(1 - c^2*x^2)^2*(a + b*ArcSi
n[c*x])^2)/5
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{5}d^2x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+\frac{1}{5}(4d)\int\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx \\
&\quad -\frac{1}{5}\left(2bcd^2\right)\int x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx \\
&= \frac{2bd^2\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{25c}+\frac{4}{15}d^2x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{5}d^2x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+\frac{1}{15}\left(8d^2\right)\int(a+b\arcsin(cx))^2\,dx \\
&\quad -\frac{1}{25}\left(2b^2d^2\right)\int\left(1-c^2x^2\right)^2\,dx-\frac{1}{15}\left(8bcd^2\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx \\
&= \frac{8bd^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))}{45c}+\frac{2bd^2\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{25c} \\
&\quad +\frac{8}{15}d^2x(a+b\arcsin(cx))^2+\frac{4}{15}d^2x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{5}d^2x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2-\frac{1}{25}\left(2b^2d^2\right)\int\left(1-2c^2x^2+c^4x^4\right)\,dx \\
&\quad -\frac{1}{45}\left(8b^2d^2\right)\int\left(1-c^2x^2\right)\,dx-\frac{1}{15}\left(16bcd^2\right)\int\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{58}{225}b^2d^2x+\frac{76}{675}b^2c^2d^2x^3-\frac{2}{125}b^2c^4d^2x^5+\frac{16bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{15c} \\
&\quad +\frac{8bd^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))}{45c}+\frac{2bd^2\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{25c} \\
&\quad +\frac{8}{15}d^2x(a+b\arcsin(cx))^2+\frac{4}{15}d^2x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{5}d^2x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2-\frac{1}{15}\left(16b^2d^2\right)\int 1\,dx
\end{aligned}
$$

$$= -\frac{298}{225}b^2d^2x + \frac{76}{675}b^2c^2d^2x^3 - \frac{2}{125}b^2c^4d^2x^5 + \frac{16bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{15c} + \frac{8bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{45c} + \frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{25c} + \frac{8}{15}d^2x(a+b\arcsin(cx))^2 + \frac{4}{15}d^2x(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{1}{5}d^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 193, normalized size of antiderivative = 0.88

$$\int \left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2\,dx$$

$$= \frac{d^2\left(225a^2cx(15-10c^2x^2+3c^4x^4)+30ab\sqrt{1-c^2x^2}(149-38c^2x^2+9c^4x^4)-2b^2cx(2235-190c^2x^2+27c^4\right.}{}$$

```
[In] Integrate[(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*(225*a^2*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 30*a*b*Sqrt[1 - c^2*x^2]*
(149 - 38*c^2*x^2 + 9*c^4*x^4) - 2*b^2*c*x*(2235 - 190*c^2*x^2 + 27*c^4*x^4
) + 30*b*(15*a*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*(149
 - 38*c^2*x^2 + 9*c^4*x^4))*ArcSin[c*x] + 225*b^2*c*x*(15 - 10*c^2*x^2 + 3*
c^4*x^4)*ArcSin[c*x]^2))/(3375*c)
```

Maple [A] (verified)

Time = 0.10 (sec) , antiderivative size = 275, normalized size of antiderivative = 1.26

method	result
derivativedivides	$\frac{d^2a^2\left(\frac{1}{5}c^5x^5-\frac{2}{3}c^3x^3+cx\right)+d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{25}-\frac{2\left(3c^4x^4-10c^2x^2+15\right.}{375}\right.}{}$
default	$\frac{d^2a^2\left(\frac{1}{5}c^5x^5-\frac{2}{3}c^3x^3+cx\right)+d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{25}-\frac{2\left(3c^4x^4-10c^2x^2+15\right.}{375}\right.}{}$
parts	$d^2a^2\left(\frac{1}{5}c^4x^5-\frac{2}{3}c^2x^3+x\right)+\frac{d^2b^2\left(\frac{\arcsin(cx)^2\left(3c^4x^4-10c^2x^2+15\right)cx}{15}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{25}-\frac{2\left(3c^4x^4\right.}{}\right.}{}$

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(d^2*a^2*(1/5*c^5*x^5-2/3*c^3*x^3+c*x)+d^2*b^2*(1/15*arcsin(c*x)^2*(3*c
^4*x^4-10*c^2*x^2+15)*c*x+2/25*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)
-2/375*(3*c^4*x^4-10*c^2*x^2+15)*c*x-8/45*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^2
```

```
+1)^(1/2)+8/135*(c^2*x^2-3)*c*x-16/15*c*x+16/15*arcsin(c*x)*(-c^2*x^2+1)^(1
/2))+2*d^2*a*b*(1/5*arcsin(c*x)*c^5*x^5-2/3*c^3*x^3*arcsin(c*x)+c*x*arcsin(
c*x)+149/225*(-c^2*x^2+1)^(1/2)+1/25*c^4*x^4*(-c^2*x^2+1)^(1/2)-38/225*c^2*
x^2*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 247, normalized size of antiderivative = 1.13

$$\int \left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2\,dx$$
$$=\frac{27\,(25\,a^2-2\,b^2)c^5d^2x^5-10\,(225\,a^2-38\,b^2)c^3d^2x^3+15\,(225\,a^2-298\,b^2)cd^2x+225\,(3\,b^2c^5d^2x^5-10\,b^2c^3d$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/3375*(27*(25*a^2 - 2*b^2)*c^5*d^2*x^5 - 10*(225*a^2 - 38*b^2)*c^3*d^2*x^3
 + 15*(225*a^2 - 298*b^2)*c*d^2*x + 225*(3*b^2*c^5*d^2*x^5 - 10*b^2*c^3*d^2
*x^3 + 15*b^2*c*d^2*x)*arcsin(c*x)^2 + 450*(3*a*b*c^5*d^2*x^5 - 10*a*b*c^3*
d^2*x^3 + 15*a*b*c*d^2*x)*arcsin(c*x) + 30*(9*a*b*c^4*d^2*x^4 - 38*a*b*c^2*
d^2*x^2 + 149*a*b*d^2 + (9*b^2*c^4*d^2*x^4 - 38*b^2*c^2*d^2*x^2 + 149*b^2*d
^2)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A] (verification not implemented)

Time = 0.44 (sec) , antiderivative size = 389, normalized size of antiderivative = 1.78

$$\int \left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2\,dx$$
$$=\begin{cases}\frac{a^2c^4d^2x^5}{5}-\frac{2a^2c^2d^2x^3}{3}+a^2d^2x+\frac{2abc^4d^2x^5\operatorname{asin}(cx)}{5}+\frac{2abc^3d^2x^4\sqrt{-c^2x^2+1}}{25}-\frac{4abc^2d^2x^3\operatorname{asin}(cx)}{3}-\frac{76abcd^2x^2\sqrt{-c^2x^2+1}}{225}+ \\ a^2d^2x\end{cases}$$

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*c**4*d**2*x**5/5 - 2*a**2*c**2*d**2*x**3/3 + a**2*d**2*x +
2*a*b*c**4*d**2*x**5*asin(c*x)/5 + 2*a*b*c**3*d**2*x**4*sqrt(-c**2*x**2 + 1
)/25 - 4*a*b*c**2*d**2*x**3*asin(c*x)/3 - 76*a*b*c*d**2*x**2*sqrt(-c**2*x**
2 + 1)/225 + 2*a*b*d**2*x*asin(c*x) + 298*a*b*d**2*sqrt(-c**2*x**2 + 1)/(22
5*c) + b**2*c**4*d**2*x**5*asin(c*x)**2/5 - 2*b**2*c**4*d**2*x**5/125 + 2*b
**2*c**3*d**2*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/25 - 2*b**2*c**2*d**2*x**
3*asin(c*x)**2/3 + 76*b**2*c**2*d**2*x**3/675 - 76*b**2*c*d**2*x**2*sqrt(-c
**2*x**2 + 1)*asin(c*x)/225 + b**2*d**2*x*asin(c*x)**2 - 298*b**2*d**2*x/22
5 + 298*b**2*d**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(225*c), Ne(c, 0)), (a**2*
d**2*x, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 465 vs. $2(193) = 386$.

Time = 0.29 (sec) , antiderivative size = 465, normalized size of antiderivative = 2.12

$$
\begin{aligned}
&\int \left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))^2\,dx \\
&= \frac{1}{5}\,b^2c^4d^2x^5\arcsin\left(cx\right)^2 + \frac{1}{5}\,a^2c^4d^2x^5 - \frac{2}{3}\,b^2c^2d^2x^3\arcsin\left(cx\right)^2 \\
&\quad + \frac{2}{75}\left(15\,x^5\arcsin\left(cx\right) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abc^4d^2 \\
&\quad + \frac{2}{1125}\left(15\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\arcsin\left(cx\right) - \frac{9\,c^4x^5+20\,c^2x^3+120}{c^4}\right. \\
&\quad - \frac{2}{3}\,a^2c^2d^2x^3 - \frac{4}{9}\left(3\,x^3\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abc^2d^2 \\
&\quad - \frac{4}{27}\left(3\,c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\arcsin\left(cx\right) - \frac{c^2x^3+6\,x}{c^2}\right)b^2c^2d^2 \\
&\quad + b^2d^2x\arcsin\left(cx\right)^2 - 2\,b^2d^2\left(x - \frac{\sqrt{-c^2x^2+1}\arcsin\left(cx\right)}{c}\right) \\
&\quad + a^2d^2x + \frac{2\left(cx\arcsin\left(cx\right)+\sqrt{-c^2x^2+1}\right)abd^2}{c}
\end{aligned}
$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/5*b^2*c^4*d^2*x^5*arcsin(c*x)^2 + 1/5*a^2*c^4*d^2*x^5 - 2/3*b^2*c^2*d^2*x
^3*arcsin(c*x)^2 + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2
 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^4*d^2
+ 2/1125*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 +
 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)
/c^4)*b^2*c^4*d^2 - 2/3*a^2*c^2*d^2*x^3 - 4/9*(3*x^3*arcsin(c*x) + c*(sqrt(
-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^2*d^2 - 4/27*(3*c*
(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*
x^3 + 6*x)/c^2)*b^2*c^2*d^2 + b^2*d^2*x*arcsin(c*x)^2 - 2*b^2*d^2*(x - sqrt
(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d^2*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*
x^2 + 1))*a*b*d^2/c
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 374, normalized size of antiderivative = 1.71

$$\int \left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))^2\,dx = \frac{1}{5}\,a^2c^4d^2x^5 - \frac{2}{3}\,a^2c^2d^2x^3 + \frac{1}{5}\,\left(c^2x^2-1\right)^2b^2d^2x\arcsin\left(cx\right)^2 + \frac{2}{5}\,\left(c^2x^2-1\right)^2abd^2x\arcsin\left(cx\right) - \frac{4}{15}\,\left(c^2x^2-1\right)b^2d^2x\arcsin\left(cx\right)^2 - \frac{2}{125}\,\left(c^2x^2-1\right)^2b^2d^2x - \frac{8}{15}\,\left(c^2x^2-1\right)abd^2x\arcsin\left(cx\right) + \frac{8}{15}\,b^2d^2x\arcsin\left(cx\right)^2 + \frac{2\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}b^2d^2\arcsin\left(cx\right)}{25\,c} + \frac{272}{3375}\,\left(c^2x^2-1\right)b^2d^2x + \frac{16}{15}\,abd^2x\arcsin\left(cx\right) + \frac{2\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}abd^2}{25\,c} + \frac{8\left(-c^2x^2+1\right)^{\frac{3}{2}}b^2d^2\arcsin\left(cx\right)}{45\,c} + a^2d^2x - \frac{4144}{3375}\,b^2d^2x + \frac{8\left(-c^2x^2+1\right)^{\frac{3}{2}}abd^2}{45\,c} + \frac{16\sqrt{-c^2x^2+1}b^2d^2\arcsin\left(cx\right)}{15\,c} + \frac{16\sqrt{-c^2x^2+1}abd^2}{15\,c}$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/5*a^2*c^4*d^2*x^5 - 2/3*a^2*c^2*d^2*x^3 + 1/5*(c^2*x^2 - 1)^2*b^2*d^2*x*a
rcsin(c*x)^2 + 2/5*(c^2*x^2 - 1)^2*a*b*d^2*x*arcsin(c*x) - 4/15*(c^2*x^2 -
1)*b^2*d^2*x*arcsin(c*x)^2 - 2/125*(c^2*x^2 - 1)^2*b^2*d^2*x - 8/15*(c^2*x^
2 - 1)*a*b*d^2*x*arcsin(c*x) + 8/15*b^2*d^2*x*arcsin(c*x)^2 + 2/25*(c^2*x^2
 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c + 272/3375*(c^2*x^2 - 1)*b
^2*d^2*x + 16/15*a*b*d^2*x*arcsin(c*x) + 2/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2
 + 1)*a*b*d^2/c + 8/45*(-c^2*x^2 + 1)^(3/2)*b^2*d^2*arcsin(c*x)/c + a^2*d^2
*x - 4144/3375*b^2*d^2*x + 8/45*(-c^2*x^2 + 1)^(3/2)*a*b*d^2/c + 16/15*sqrt
(-c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c + 16/15*sqrt(-c^2*x^2 + 1)*a*b*d^2/c
```

Mupad [F(-1)]

Timed out.

$$\int (d - c^2dx^2)^2 (a + b\arcsin(cx))^2 \, dx = \int (a + b\,\text{asin}(c\,x))^2 \left(d - c^2\,d\,x^2\right)^2 \, dx$$

```
[In] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2,x)
[Out] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2, x)
```

3.170 $\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 271

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x}\,dx = \frac{13}{32}b^2c^2d^2x^2 - \frac{1}{32}b^2c^4d^2x^4 - \frac{11}{16}bcd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{1}{8}bcd^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx)) - \frac{11}{32}d^2(a+b\arcsin(cx))^2 + \frac{1}{2}d^2(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{1}{4}d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2 - \frac{id^2(a+b\arcsin(cx))^3}{3b} + d^2(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) - ibd^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) + \frac{1}{2}b^2d^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)$$

```
[Out] 13/32*b^2*c^2*d^2*x^2-1/32*b^2*c^4*d^2*x^4-1/8*b*c*d^2*x*(-c^2*x^2+1)^(3/2)
*(a+b*arcsin(c*x))-11/32*d^2*(a+b*arcsin(c*x))^2+1/2*d^2*(-c^2*x^2+1)*(a+b*
arcsin(c*x))^2+1/4*d^2*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2-1/3*I*d^2*(a+b*ar
csin(c*x))^3/b+d^2*(a+b*arcsin(c*x))^2*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-I
*b*d^2*(a+b*arcsin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*b^2*d^
2*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-11/16*b*c*d^2*x*(a+b*arcsin(c*x))
*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 271, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {4787, 4721, 3798, 2221, 2611, 2320, 6724, 4741, 4737, 30, 4743, 14}

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x} \, dx = -\frac{1}{8}bcd^2x(1-c^2x^2)^{3/2} (a+b\arcsin(cx)) - \frac{11}{16}bcd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) + \frac{1}{4}d^2(1-c^2x^2)^2 (a+b\arcsin(cx))^2 + \frac{1}{2}d^2(1-c^2x^2) (a+b\arcsin(cx))^2 - ibd^2 \operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) (a+b\arcsin(cx)) - \frac{id^2(a+b\arcsin(cx))^3}{3b} - \frac{11}{32}d^2(a+b\arcsin(cx))^2 + d^2\log\left(1-e^{2i\arcsin(cx)}\right) (a+b\arcsin(cx))^2 + \frac{1}{2}b^2d^2 \operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right) - \frac{1}{32}b^2c^4d^2x^4 + \frac{13}{32}b^2c^2d^2x^2$$

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (13*b^2*c^2*d^2*x^2)/32 - (b^2*c^4*d^2*x^4)/32 - (11*b*c*d^2*x*Sqrt[1 - c^2
*x^2]*(a + b*ArcSin[c*x]))/16 - (b*c*d^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
n[c*x]))/8 - (11*d^2*(a + b*ArcSin[c*x])^2)/32 + (d^2*(1 - c^2*x^2)*(a + b*
ArcSin[c*x])^2)/2 + (d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/4 - ((I/3)*
d^2*(a + b*ArcSin[c*x])^3)/b + d^2*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*A
rcSin[c*x])] - I*b*d^2*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])
] + (b^2*d^2*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
```

```
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+d\int\frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x}\,dx \\
&\quad-\frac{1}{2}\left(bcd^2\right)\int\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx \\
&= -\frac{1}{8}bcd^2x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad+\frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+d^2\int\frac{(a+b\arcsin(cx))^2}{x}\,dx \\
&\quad-\frac{1}{8}\left(3bcd^2\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx \\
&\quad-\left(bcd^2\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx+\frac{1}{8}\left(b^2c^2d^2\right)\int x\left(1-c^2x^2\right)\,dx
\end{aligned}$$

$$= -\frac{11}{16}bcd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{1}{8}bcd^2x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 + d^2\text{Subst}\left(\int (a+bx)^2\cot(x)\,dx, x, \arcsin(cx)\right) - \frac{1}{16}\left(3bcd^2\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx - \frac{1}{2}\left(bcd^2\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx + \frac{1}{8}\left(b^2c^2d^2\right)\int \left(x-c^2x^3\right)\,dx + \frac{1}{16}\left(3b^2c^2d^2\right)\int x\,dx + \frac{1}{2}\left(b^2c^2d^2\right)\int x\,dx$$

$$= \frac{13}{32}b^2c^2d^2x^2 - \frac{1}{32}b^2c^4d^2x^4 - \frac{11}{16}bcd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{1}{8}bcd^2x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{11}{32}d^2(a+b\arcsin(cx))^2 + \frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 - \frac{id^2(a+b\arcsin(cx))^3}{3b} - \left(2id^2\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)^2}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)$$

$$= \frac{13}{32}b^2c^2d^2x^2 - \frac{1}{32}b^2c^4d^2x^4 - \frac{11}{16}bcd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{1}{8}bcd^2x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{11}{32}d^2(a+b\arcsin(cx))^2 + \frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 - \frac{id^2(a+b\arcsin(cx))^3}{3b} + d^2(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) - \left(2bd^2\right)\text{Subst}\left(\int (a+bx)\log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)$$

$$= \frac{13}{32}b^2c^2d^2x^2 - \frac{1}{32}b^2c^4d^2x^4 - \frac{11}{16}bcd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{1}{8}bcd^2x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{11}{32}d^2(a+b\arcsin(cx))^2 + \frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 - \frac{id^2(a+b\arcsin(cx))^3}{3b} + d^2(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) - ibd^2(a+b\arcsin(cx))\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right) + \left(ib^2d^2\right)\text{Subst}\left(\int \text{PolyLog}\left(2, e^{2ix}\right)\,dx, x, \arcsin(cx)\right)$$

$$
\begin{aligned}
&= \frac{13}{32}b^2c^2d^2x^2 - \frac{1}{32}b^2c^4d^2x^4 - \frac{11}{16}bcd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad - \frac{1}{8}bcd^2x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{11}{32}d^2(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 \\
&\quad - \frac{id^2(a+b\arcsin(cx))^3}{3b} + d^2(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) \\
&\quad - ibd^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) \\
&\quad + \frac{1}{2}\left(b^2d^2\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{13}{32}b^2c^2d^2x^2 - \frac{1}{32}b^2c^4d^2x^4 - \frac{11}{16}bcd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad - \frac{1}{8}bcd^2x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{11}{32}d^2(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{2}d^2\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{1}{4}d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 \\
&\quad - \frac{id^2(a+b\arcsin(cx))^3}{3b} + d^2(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) \\
&\quad - ibd^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) + \frac{1}{2}b^2d^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.45 (sec) , antiderivative size = 371, normalized size of antiderivative = 1.37

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x}\,dx = \frac{1}{768}d^2\Big(-32ib^2\pi^3-768a^2c^2x^2+192a^2c^4x^4 - 624abcx\sqrt{1-c^2x^2}+96abc^3x^3\sqrt{1-c^2x^2} - 1536abc^2x^2\arcsin(cx)+384abc^4x^4\arcsin(cx) - 768iab\arcsin(cx)^2+256ib^2\arcsin(cx)^3 + 1248ab\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right) - 144b^2\cos(2\arcsin(cx)) + 288b^2\arcsin(cx)^2\cos(2\arcsin(cx)) - 3b^2\cos(4\arcsin(cx)) + 24b^2\arcsin(cx)^2\cos(4\arcsin(cx)) + 768b^2\arcsin(cx)^2\log\left(1-e^{-2i\arcsin(cx)}\right) + 1536ab\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) + 768a^2\log(cx) + 768ib^2\arcsin(cx)\operatorname{PolyLog}\left(2,e^{-2i\arcsin(cx)}\right) - 768iab\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) + 384b^2\operatorname{PolyLog}\left(3,e^{-2i\arcsin(cx)}\right) - 288b^2\arcsin(cx)\sin(2\arcsin(cx)) - 12b^2\arcsin(cx)\sin(4\arcsin(cx))\Big)$$

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (d^2*((-32*I)*b^2*Pi^3 - 768*a^2*c^2*x^2 + 192*a^2*c^4*x^4 - 624*a*b*c*x*Sq
rt[1 - c^2*x^2] + 96*a*b*c^3*x^3*Sqrt[1 - c^2*x^2] - 1536*a*b*c^2*x^2*ArcSi
n[c*x] + 384*a*b*c^4*x^4*ArcSin[c*x] - (768*I)*a*b*ArcSin[c*x]^2 + (256*I)*
b^2*ArcSin[c*x]^3 + 1248*a*b*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])] - 144*b
^2*Cos[2*ArcSin[c*x]] + 288*b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] - 3*b^2*Co
s[4*ArcSin[c*x]] + 24*b^2*ArcSin[c*x]^2*Cos[4*ArcSin[c*x]] + 768*b^2*ArcSin
[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] + 1536*a*b*ArcSin[c*x]*Log[1 - E^((
2*I)*ArcSin[c*x])] + 768*a^2*Log[c*x] + (768*I)*b^2*ArcSin[c*x]*PolyLog[2,
E^((-2*I)*ArcSin[c*x])] - (768*I)*a*b*PolyLog[2, E^((2*I)*ArcSin[c*x])] + 3
84*b^2*PolyLog[3, E^((-2*I)*ArcSin[c*x])] - 288*b^2*ArcSin[c*x]*Sin[2*ArcSi
n[c*x]] - 12*b^2*ArcSin[c*x]*Sin[4*ArcSin[c*x]]))/768
```

Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 428, normalized size of antiderivative = 1.58

method	result
parts	$d^2a^2\left(\frac{c^4x^4}{4}-c^2x^2+\ln(x)\right)+d^2b^2\left(-\frac{i\arcsin(cx)^3}{3}+\arcsin(cx)^2\ln\left(1+icx+\sqrt{-c^2x^2+1}\right.\right.$
derivativedivides	$d^2a^2\left(\frac{c^4x^4}{4}-c^2x^2+\ln(cx)\right)+d^2b^2\left(-\frac{i\arcsin(cx)^3}{3}+\arcsin(cx)^2\ln\left(1+icx+\sqrt{-c^2x^2+}\right.\right.$
default	$d^2a^2\left(\frac{c^4x^4}{4}-c^2x^2+\ln(cx)\right)+d^2b^2\left(-\frac{i\arcsin(cx)^3}{3}+\arcsin(cx)^2\ln\left(1+icx+\sqrt{-c^2x^2+}\right.\right.$

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x,x,method=_RETURNVERBOSE)
```

```
[Out] d^2*a^2*(1/4*c^4*x^4-c^2*x^2+ln(x))+d^2*b^2*(-1/3*I*arcsin(c*x)^3+arcsin(c*
x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*
x^2+1)^(1/2))+2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+arcsin(c*x)^2*ln(1-I*c
*x-(-c^2*x^2+1)^(1/2))-2*I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+
2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))+1/256*(8*arcsin(c*x)^2-1)*cos(4*arcsi
n(c*x))-1/64*arcsin(c*x)*sin(4*arcsin(c*x))+3/16*(2*arcsin(c*x)^2-1)*cos(2*
arcsin(c*x))-3/8*arcsin(c*x)*sin(2*arcsin(c*x)))+2*d^2*a*b*(-1/2*I*arcsin(c
*x)^2+arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*polylog(2,-I*c*x-(-c^2*x
^2+1)^(1/2))+arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*polylog(2,I*c*x+(
-c^2*x^2+1)^(1/2))+1/32*arcsin(c*x)*cos(4*arcsin(c*x))-1/128*sin(4*arcsin(c
*x))+3/8*arcsin(c*x)*cos(2*arcsin(c*x))-3/16*sin(2*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^2\,(a+b\arcsin(cx))^2}{x}\,dx=\int \frac{(c^2dx^2-d)^2(b\arcsin(cx)+a)^2}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))/x, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x}\,dx = d^2\left(\int \frac{a^2}{x}\,dx + \int \left(-2a^2c^2x\right)\,dx + \int a^2c^4x^3\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{x}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{x}\,dx + \int \left(-2b^2c^2x\operatorname{asin}^2(cx)\right)\,dx + \int b^2c^4x^3\operatorname{asin}^2(cx)\,dx + \int \left(-4abc^2x\operatorname{asin}(cx)\right)\,dx + \int 2abc^4x^3\operatorname{asin}(cx)\,dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2/x,x)
```

```
[Out] d**2*(Integral(a**2/x, x) + Integral(-2*a**2*c**2*x, x) + Integral(a**2*c**
4*x**3, x) + Integral(b**2*asin(c*x)**2/x, x) + Integral(2*a*b*asin(c*x)/x,
 x) + Integral(-2*b**2*c**2*x*asin(c*x)**2, x) + Integral(b**2*c**4*x**3*as
in(c*x)**2, x) + Integral(-4*a*b*c**2*x*asin(c*x), x) + Integral(2*a*b*c**4
*x**3*asin(c*x), x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x}\,dx = \int \frac{(c^2dx^2-d)^2(b\arcsin(cx)+a)^2}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] 1/4*a^2*c^4*d^2*x^4 - a^2*c^2*d^2*x^2 + a^2*d^2*log(x) + integrate(((b^2*c^
4*d^2*x^4 - 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1)))/x, x)
```

Giac [F]

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x}\,dx = \int \frac{(c^2dx^2-d)^2(b\arcsin(cx)+a)^2}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)^2/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^2}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x, x)
```

3.171 $\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 249

$$
\begin{aligned}
\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x^2}\,dx &= \frac{32}{9}b^2c^2d^2x-\frac{2}{27}b^2c^4d^2x^3 \\
&\quad -\frac{10}{3}bcd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad -\frac{2}{9}bcd^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) \\
&\quad -\frac{8}{3}c^2d^2x(a+b\arcsin(cx))^2 \\
&\quad -\frac{4}{3}c^2d^2x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad -\frac{d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2}{x} \\
&\quad -4bcd^2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right) \\
&\quad +2ib^2cd^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) \\
&\quad -2ib^2cd^2\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)
\end{aligned}
$$

```
[Out] 32/9*b^2*c^2*d^2*x-2/27*b^2*c^4*d^2*x^3-2/9*b*c*d^2*(-c^2*x^2+1)^(3/2)*(a+b
*arcsin(c*x))-8/3*c^2*d^2*x*(a+b*arcsin(c*x))^2-4/3*c^2*d^2*x*(-c^2*x^2+1)*
(a+b*arcsin(c*x))^2-d^2*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/x-4*b*c*d^2*(a+b
*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))+2*I*b^2*c*d^2*polylog(2,-I*
c*x-(-c^2*x^2+1)^(1/2))-2*I*b^2*c*d^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1
0/3*b*c*d^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.407, Rules used = {4785, 4743, 4715, 4767, 8, 4787, 4783, 4803, 4268, 2317, 2438}

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x^2} dx = -4bcd^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx)) - \frac{4}{3}c^2d^2x(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{2}{9}bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx)) - \frac{10}{3}bcd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{x} - \frac{8}{3}c^2d^2x(a+b\arcsin(cx))^2 + 2ib^2cd^2\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) - 2ib^2cd^2\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right) - \frac{2}{27}b^2c^4d^2x^3 + \frac{32}{9}b^2c^2d^2x$$

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (32*b^2*c^2*d^2*x)/9 - (2*b^2*c^4*d^2*x^3)/27 - (10*b*c*d^2*Sqrt[1 - c^2*x^
2]*(a + b*ArcSin[c*x]))/3 - (2*b*c*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*
x]))/9 - (8*c^2*d^2*x*(a + b*ArcSin[c*x])^2)/3 - (4*c^2*d^2*x*(1 - c^2*x^2)
*(a + b*ArcSin[c*x])^2)/3 - (d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/x -
 4*b*c*d^2*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])] + (2*I)*b^2*c*d^2
*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*b^2*c*d^2*PolyLog[2, E^(I*ArcSin[c*
x])]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^2(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{x} - (4c^2d)\int \left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx \\
&\quad + (2bcd^2)\int \frac{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{x}\,dx \\
&= \frac{2}{3}bcd^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{4}{3}c^2d^2x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad - \frac{d^2(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{x} + (2bcd^2)\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x}\,dx \\
&\quad - \frac{1}{3}(8c^2d^2)\int (a+b\arcsin(cx))^2\,dx - \frac{1}{3}(2b^2c^2d^2)\int \left(1-c^2x^2\right)\,dx \\
&\quad + \frac{1}{3}(8bc^3d^2)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx
\end{aligned}$$

$$= -\frac{2}{3}b^2c^2d^2x + \frac{2}{9}b^2c^4d^2x^3 + 2bcd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{2}{9}bcd^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{8}{3}c^2d^2x(a+b\arcsin(cx))^2 - \frac{4}{3}c^2d^2x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 - \frac{d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2}{x} + \left(2bcd^2\right)\int \frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx + \frac{1}{9}\left(8b^2c^2d^2\right)\int \left(1-c^2x^2\right)\,dx - \left(2b^2c^2d^2\right)\int 1\,dx + \frac{1}{3}\left(16bc^3d^2\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{16}{9}b^2c^2d^2x - \frac{2}{27}b^2c^4d^2x^3 - \frac{10}{3}bcd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{2}{9}bcd^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{8}{3}c^2d^2x(a+b\arcsin(cx))^2 - \frac{4}{3}c^2d^2x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 - \frac{d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2}{x} + \left(2bcd^2\right)\operatorname{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \arcsin(cx)\right) + \frac{1}{3}\left(16b^2c^2d^2\right)\int 1\,dx$$

$$= \frac{32}{9}b^2c^2d^2x - \frac{2}{27}b^2c^4d^2x^3 - \frac{10}{3}bcd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{2}{9}bcd^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{8}{3}c^2d^2x(a+b\arcsin(cx))^2 - \frac{4}{3}c^2d^2x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 - \frac{d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2}{x} - 4bcd^2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right) - \left(2b^2cd^2\right)\operatorname{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right) + \left(2b^2cd^2\right)\operatorname{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)$$

$$= \frac{32}{9}b^2c^2d^2x - \frac{2}{27}b^2c^4d^2x^3 - \frac{10}{3}bcd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{2}{9}bcd^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{8}{3}c^2d^2x(a+b\arcsin(cx))^2 - \frac{4}{3}c^2d^2x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 - \frac{d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2}{x} - 4bcd^2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right) + \left(2ib^2cd^2\right)\operatorname{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right) - \left(2ib^2cd^2\right)\operatorname{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)$$

$$
\begin{aligned}
&= \frac{32}{9}b^2c^2d^2x - \frac{2}{27}b^2c^4d^2x^3 - \frac{10}{3}bcd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad - \frac{2}{9}bcd^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{8}{3}c^2d^2x(a+b\arcsin(cx))^2 \\
&\quad - \frac{4}{3}c^2d^2x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 - \frac{d^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2}{x} \\
&\quad - 4bcd^2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right) + 2ib^2cd^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) \\
&\quad - 2ib^2cd^2\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.11 (sec) , antiderivative size = 322, normalized size of antiderivative = 1.29

$$
\begin{aligned}
&\int \frac{\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2}{x^2}\,dx \\
&= \frac{1}{54}d^2\Bigg(-\frac{54a^2}{x} - 108a^2c^2x + 18a^2c^4x^3 + 12abc\sqrt{1-c^2x^2}\left(2+c^2x^2\right) + 36abc^4x^3\arcsin(cx) \\
&\quad - 189b^2c\sqrt{1-c^2x^2}\arcsin(cx) - 216abc\left(\sqrt{1-c^2x^2}+cx\arcsin(cx)\right) \\
&\quad - 108b^2c^2x\left(-2+\arcsin(cx)^2\right) + 2b^2c^2x\left(-2\left(6+c^2x^2\right)+9c^2x^2\arcsin(cx)^2\right) \\
&\quad - \frac{108ab\left(\arcsin(cx)+cx\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)\right)}{x} - 3b^2c\arcsin(cx)\cos(3\arcsin(cx)) \\
&\quad - \frac{54b^2\arcsin(cx)\left(\arcsin(cx)+2cx\left(-\log\left(1-e^{i\arcsin(cx)}\right)+\log\left(1+e^{i\arcsin(cx)}\right)\right)\right)}{x} \\
&\quad + 108ib^2c\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) - 108ib^2c\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)\Bigg)
\end{aligned}
$$

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (d^2*((-54*a^2)/x - 108*a^2*c^2*x + 18*a^2*c^4*x^3 + 12*a*b*c*Sqrt[1 - c^2*
x^2]*(2 + c^2*x^2) + 36*a*b*c^4*x^3*ArcSin[c*x] - 189*b^2*c*Sqrt[1 - c^2*x^
2]*ArcSin[c*x] - 216*a*b*c*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]) - 108*b^2*
c^2*x*(-2 + ArcSin[c*x]^2) + 2*b^2*c^2*x*(-2*(6 + c^2*x^2) + 9*c^2*x^2*ArcS
in[c*x]^2) - (108*a*b*(ArcSin[c*x] + c*x*ArcTanh[Sqrt[1 - c^2*x^2]]))/x - 3
*b^2*c*ArcSin[c*x]*Cos[3*ArcSin[c*x]] - (54*b^2*ArcSin[c*x]*(ArcSin[c*x] +
2*c*x*(-Log[1 - E^(I*ArcSin[c*x])] + Log[1 + E^(I*ArcSin[c*x])])))/x + (108
*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])] - (108*I)*b^2*c*PolyLog[2, E^(I*Ar
cSin[c*x])]))/54
```

Maple [A] (verified)

Time = 0.17 (sec) , antiderivative size = 372, normalized size of antiderivative = 1.49

method	result
derivativedivides	$c\left(d^2a^2\left(\frac{c^3x^3}{3}-2cx-\frac{1}{cx}\right)-\frac{7d^2b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{2}-\frac{7d^2b^2\arcsin(cx)^2cx}{4}+\frac{7d^2b^2cx}{2}-\frac{d^2b^2\arcsin}{cx}\right.$
default	$c\left(d^2a^2\left(\frac{c^3x^3}{3}-2cx-\frac{1}{cx}\right)-\frac{7d^2b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{2}-\frac{7d^2b^2\arcsin(cx)^2cx}{4}+\frac{7d^2b^2cx}{2}-\frac{d^2b^2\arcsin}{cx}\right.$
parts	$d^2a^2\left(\frac{c^4x^3}{3}-2c^2x-\frac{1}{x}\right)-\frac{7d^2b^2c\sqrt{-c^2x^2+1}\arcsin(cx)}{2}-\frac{7d^2b^2c^2\arcsin(cx)^2x}{4}+\frac{7b^2c^2d^2x}{2}-\frac{d^2b^2\arcsin}{x}$

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] c*(d^2*a^2*(1/3*c^3*x^3-2*c*x-1/c/x)-7/2*d^2*b^2*arcsin(c*x)*(-c^2*x^2+1)^(
1/2)-7/4*d^2*b^2*arcsin(c*x)^2*c*x+7/2*d^2*b^2*c*x-d^2*b^2/c/x*arcsin(c*x)^
2-2*d^2*b^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*d^2*b^2*arcsin(c*x
)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*d^2*b^2*polylog(2,-I*c*x-(-c^2*x^2+1)^
(1/2))-2*I*d^2*b^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/18*d^2*b^2*arcsin(
c*x)*cos(3*arcsin(c*x))-1/12*d^2*b^2*arcsin(c*x)^2*sin(3*arcsin(c*x))+1/54*
d^2*b^2*sin(3*arcsin(c*x))+2*d^2*a*b*(1/3*c^3*x^3*arcsin(c*x)-2*c*x*arcsin(
c*x)-1/c/x*arcsin(c*x)+1/9*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/9*(-c^2*x^2+1)^(1/
2)-arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^2\,(a+b\arcsin(cx))^2}{x^2}\,dx=\int \frac{(c^2dx^2-d)^2(b\arcsin{(cx)}+a)^2}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))/x^2, x)
```

Sympy [F]

$$\begin{aligned}\int \frac{(d-c^2dx^2)^2\,(a+b\arcsin(cx))^2}{x^2}\,dx = d^2\Bigg(&\int \left(-2a^2c^2\right)\,dx+\int \frac{a^2}{x^2}\,dx+\int a^2c^4x^2\,dx\\ &+\int \left(-2b^2c^2\operatorname{asin}^2{(cx)}\right)\,dx+\int \frac{b^2\operatorname{asin}^2{(cx)}}{x^2}\,dx\\ &+\int \left(-4abc^2\operatorname{asin}{(cx)}\right)\,dx+\int \frac{2ab\operatorname{asin}{(cx)}}{x^2}\,dx\\ &+\int b^2c^4x^2\operatorname{asin}^2{(cx)}\,dx+\int 2abc^4x^2\operatorname{asin}{(cx)}\,dx\Bigg)\end{aligned}$$

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] d**2*(Integral(-2*a**2*c**2, x) + Integral(a**2/x**2, x) + Integral(a**2*c*
*4*x**2, x) + Integral(-2*b**2*c**2*asin(c*x)**2, x) + Integral(b**2*asin(c
*x)**2/x**2, x) + Integral(-4*a*b*c**2*asin(c*x), x) + Integral(2*a*b*asin(
c*x)/x**2, x) + Integral(b**2*c**4*x**2*asin(c*x)**2, x) + Integral(2*a*b*c
**4*x**2*asin(c*x), x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x^2}\,dx = \int \frac{(c^2dx^2-d)^2(b\arcsin(cx)+a)^2}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a^2*c^4*d^2*x^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^
2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^4*d^2 - 2*b^2*c^2*d^2*x*arcsin(c*x)^2
+ 4*b^2*c^2*d^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) - 2*a^2*c^2*d^2*x -
4*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c*d^2 - 2*(c*log(2*sqrt(-c^2*x
^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*d^2 - a^2*d^2/x + 1/3*((b^2
*c^4*d^2*x^4 - 3*b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 3*
x*integrate(2/3*(b^2*c^5*d^2*x^4 - 3*b^2*c*d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1
)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^3 - x), x))/x
```

Giac [F]

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x^2}\,dx = \int \frac{(c^2dx^2-d)^2(b\arcsin(cx)+a)^2}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)^2/x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^2}{x^2}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x^2, x)
```

3.172 $\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x^3}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 287

$$\begin{aligned}\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x^3}\,dx &= -\frac{1}{4}b^2c^4d^2x^2-\frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\\ &\quad-\frac{bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{x}\\ &\quad-\frac{1}{4}c^2d^2(a+b\arcsin(cx))^2\\ &\quad-c^2d^2(1-c^2x^2)(a+b\arcsin(cx))^2\\ &\quad-\frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2x^2}\\ &\quad+\frac{2ic^2d^2(a+b\arcsin(cx))^3}{3b}\\ &\quad-2c^2d^2(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right)\\ &\quad+b^2c^2d^2\log(x)\\ &\quad+2ibc^2d^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\\ &\quad-b^2c^2d^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)\end{aligned}$$

```
[Out] -1/4*b^2*c^4*d^2*x^2-b*c*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/x-1/4*c^2
*d^2*(a+b*arcsin(c*x))^2-c^2*d^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2-1/2*d^2*(
-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/x^2+2/3*I*c^2*d^2*(a+b*arcsin(c*x))^3/b-2
*c^2*d^2*(a+b*arcsin(c*x))^2*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+b^2*c^2*d^2
*ln(x)+2*I*b*c^2*d^2*(a+b*arcsin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))
^2)-b^2*c^2*d^2*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b*c^3*d^2*x*(a+
b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {4785, 4787, 4721, 3798, 2221, 2611, 2320, 6724, 4741, 4737, 30, 14}

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x^3} dx = 2ibc^2d^2 \operatorname{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx)) - c^2d^2(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{x} - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2x^2} + \frac{2ic^2d^2(a+b\arcsin(cx))^3}{3b} - \frac{1}{4}c^2d^2(a+b\arcsin(cx))^2 - 2c^2d^2\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - b^2c^2d^2\operatorname{PolyLog}\left(3, e^{2i\arcsin(cx)}\right) - \frac{1}{4}b^2c^4d^2x^2 + b^2c^2d^2\log(x)$$

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] -1/4*(b^2*c^4*d^2*x^2) - (b*c^3*d^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/2 - (b*c*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/x - (c^2*d^2*(a + b
*ArcSin[c*x])^2)/4 - c^2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2 - (d^2*(1
- c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(2*x^2) + (((2*I)/3)*c^2*d^2*(a + b*Arc
Sin[c*x])^3)/b - 2*c^2*d^2*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*ArcSin[c*
x])] + b^2*c^2*d^2*Log[x] + (2*I)*b*c^2*d^2*(a + b*ArcSin[c*x])*PolyLog[2,
E^((2*I)*ArcSin[c*x])] - b^2*c^2*d^2*PolyLog[3, E^((2*I)*ArcSin[c*x])]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
```

```
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{d^2(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{2x^2} - (2c^2d)\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x}\,dx \\
&\quad + (bcd^2)\int \frac{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{x^2}\,dx \\
&= -\frac{bcd^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{x} - c^2d^2(1-c^2x^2)\,(a+b\arcsin(cx))^2 \\
&\quad - \frac{d^2(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{2x^2} - (2c^2d^2)\int \frac{(a+b\arcsin(cx))^2}{x}\,dx \\
&\quad + (b^2c^2d^2)\int \frac{1-c^2x^2}{x}\,dx + (2bc^3d^2)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx \\
&\quad - (3bc^3d^2)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx
\end{aligned}
$$

$$= -\frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{x} - c^2d^2(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2x^2} - (2c^2d^2)\,\text{Subst}\left(\int (a+bx)^2\cot(x)\,dx, x, \arcsin(cx)\right) + (b^2c^2d^2)\int\left(\frac{1}{x}-c^2x\right)dx + (bc^3d^2)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx - \frac{1}{2}(3bc^3d^2)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx - (b^2c^4d^2)\int x\,dx + \frac{1}{2}(3b^2c^4d^2)\int x\,dx$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{x} - \frac{1}{4}c^2d^2(a+b\arcsin(cx))^2 - c^2d^2(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2x^2} + \frac{2ic^2d^2(a+b\arcsin(cx))^3}{3b} + b^2c^2d^2\log(x) + (4ic^2d^2)\,\text{Subst}\left(\int\frac{e^{2ix}(a+bx)^2}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{x} - \frac{1}{4}c^2d^2(a+b\arcsin(cx))^2 - c^2d^2(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2x^2} + \frac{2ic^2d^2(a+b\arcsin(cx))^3}{3b} - 2c^2d^2(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) + b^2c^2d^2\log(x) + (4bc^2d^2)\,\text{Subst}\left(\int (a+bx)\log\left(1-e^{2ix}\right)dx, x, \arcsin(cx)\right)$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{x} - \frac{1}{4}c^2d^2(a+b\arcsin(cx))^2 - c^2d^2(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2x^2} + \frac{2ic^2d^2(a+b\arcsin(cx))^3}{3b} - 2c^2d^2(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) + b^2c^2d^2\log(x) + 2ibc^2d^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right) - (2ib^2c^2d^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2, e^{2ix}\right)dx, x, \arcsin(cx)\right)$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{x} - \frac{1}{4}c^2d^2(a+b\arcsin(cx))^2 - c^2d^2(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2x^2} + \frac{2ic^2d^2(a+b\arcsin(cx))^3}{3b} - 2c^2d^2(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) + b^2c^2d^2\log(x) + 2ibc^2d^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) - (b^2c^2d^2)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)$$

$$= -\frac{1}{4}b^2c^4d^2x^2 - \frac{1}{2}bc^3d^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{x} - \frac{1}{4}c^2d^2(a+b\arcsin(cx))^2 - c^2d^2(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2x^2} + \frac{2ic^2d^2(a+b\arcsin(cx))^3}{3b} - 2c^2d^2(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) + b^2c^2d^2\log(x) + 2ibc^2d^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) - b^2c^2d^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.74 (sec) , antiderivative size = 361, normalized size of antiderivative = 1.26

$$\int\frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x^3}\,dx$$

$$= \frac{1}{2}d^2\left(-\frac{a^2}{x^2} + a^2c^4x^2 + 2abc^4x^2\arcsin(cx) - \frac{2ab\left(cx\sqrt{1-c^2x^2}+\arcsin(cx)\right)}{x^2} + abc^2\left(cx\sqrt{1-c^2x^2} - 2\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right) - \frac{1}{4}b^2c^2\left(-1+2\arcsin(cx)^2\right)\cos(2\arcsin(cx)) - 8abc^2\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - 4a^2c^2\log(x) - \frac{b^2\left(2cx\sqrt{1-c^2x^2}\arcsin(cx)+\arcsin(cx)^2-2c^2x^2\log(cx)\right)}{x^2} + 4iabc^2\left(\arcsin(cx)^2+\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\right) + \frac{1}{6}ib^2c^2\left(\pi^3 - 8\arcsin(cx)^3 + 24i\arcsin(cx)^2\log\left(1-e^{-2i\arcsin(cx)}\right) - 24\arcsin(cx)\operatorname{PolyLog}\left(2,e^{-2i\arcsin(cx)}\right) + 12i\operatorname{PolyLog}\left(3,e^{-2i\arcsin(cx)}\right)\right) + \frac{1}{2}b^2c^2\arcsin(cx)\sin(2\arcsin(cx))\right)$$

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (d^2*(-(a^2/x^2) + a^2*c^4*x^2 + 2*a*b*c^4*x^2*ArcSin[c*x] - (2*a*b*(c*x*Sq
rt[1 - c^2*x^2] + ArcSin[c*x]))/x^2 + a*b*c^2*(c*x*Sqrt[1 - c^2*x^2] - 2*Ar
cTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])]) - (b^2*c^2*(-1 + 2*ArcSin[c*x]^2)*Cos
[2*ArcSin[c*x]])/4 - 8*a*b*c^2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] -
 4*a^2*c^2*Log[x] - (b^2*(2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]
^2 - 2*c^2*x^2*Log[c*x]))/x^2 + (4*I)*a*b*c^2*(ArcSin[c*x]^2 + PolyLog[2, E
^((2*I)*ArcSin[c*x])]) + (I/6)*b^2*c^2*(Pi^3 - 8*ArcSin[c*x]^3 + (24*I)*Arc
Sin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] - 24*ArcSin[c*x]*PolyLog[2, E^((
-2*I)*ArcSin[c*x])] + (12*I)*PolyLog[3, E^((-2*I)*ArcSin[c*x])]) + (b^2*c^2
*ArcSin[c*x]*Sin[2*ArcSin[c*x]])/2))/2
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 639 vs. $2(301) = 602$.

Time = 0.31 (sec) , antiderivative size = 640, normalized size of antiderivative = 2.23

method	result
parts	$d^2a^2\left(\frac{c^4x^2}{2}-\frac{1}{2x^2}-2c^2\ln(x)\right)+d^2b^2c^2\left(\frac{2i\arcsin(cx)^3}{3}+\frac{\left(2i\arcsin(cx)+2\arcsin(cx)^2-1\right)\left(2c^2x^2-2ic\right.}{16}\right.$
derivativedivides	$c^2\left(d^2a^2\left(\frac{c^2x^2}{2}-\frac{1}{2c^2x^2}-2\ln(cx)\right)+d^2b^2\left(\frac{2i\arcsin(cx)^3}{3}+\frac{\left(2i\arcsin(cx)+2\arcsin(cx)^2-1\right)\left(2c^2x^2-\right.}{16}\right.\right.$
default	$c^2\left(d^2a^2\left(\frac{c^2x^2}{2}-\frac{1}{2c^2x^2}-2\ln(cx)\right)+d^2b^2\left(\frac{2i\arcsin(cx)^3}{3}+\frac{\left(2i\arcsin(cx)+2\arcsin(cx)^2-1\right)\left(2c^2x^2-\right.}{16}\right.\right.$

```
[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] d^2*a^2*(1/2*c^4*x^2-1/2/x^2-2*c^2*ln(x))+d^2*b^2*c^2*(2/3*I*arcsin(c*x)^3+
1/16*(2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1
/2)-1)+1/16*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*(-2*I*arcsin(c*x)+2*ar
csin(c*x)^2-1)-1/2*arcsin(c*x)*(-2*I*c^2*x^2+2*c*x*(-c^2*x^2+1)^(1/2)+arcsi
n(c*x))/c^2/x^2+ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-2*ln(I*c*x+(-c^2*x^2+1)^(1/2
))+ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(
1/2))+4*I*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-4*polylog(3,-I*c
*x-(-c^2*x^2+1)^(1/2))-2*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+4*I*a
rcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-4*polylog(3,I*c*x+(-c^2*x^2+
1)^(1/2)))+2*d^2*a*b*c^2*(I*arcsin(c*x)^2+1/16*(I+2*arcsin(c*x))*(2*c^2*x^2
-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)+1/16*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1
)*(-I+2*arcsin(c*x))-1/2*(-I*c^2*x^2+c*x*(-c^2*x^2+1)^(1/2)+arcsin(c*x))/c^
2/x^2-2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*arcsin(c*x)*ln(1-I*c*x
-(-c^2*x^2+1)^(1/2))+2*I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*polylog(2
,I*c*x+(-c^2*x^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x^3}\,dx = \int \frac{(c^2dx^2-d)^2(b\arcsin(cx)+a)^2}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))/x^3, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x^3}\,dx = d^2\left(\int \frac{a^2}{x^3}\,dx + \int \left(-\frac{2a^2c^2}{x}\right)dx + \int a^2c^4x\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{x^3}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{x^3}\,dx + \int \left(-\frac{2b^2c^2\operatorname{asin}^2(cx)}{x}\right)dx + \int b^2c^4x\operatorname{asin}^2(cx)\,dx + \int \left(-\frac{4abc^2\operatorname{asin}(cx)}{x}\right)dx + \int 2abc^4x\operatorname{asin}(cx)\,dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] d**2*(Integral(a**2/x**3, x) + Integral(-2*a**2*c**2/x, x) + Integral(a**2*
c**4*x, x) + Integral(b**2*asin(c*x)**2/x**3, x) + Integral(2*a*b*asin(c*x)
/x**3, x) + Integral(-2*b**2*c**2*asin(c*x)**2/x, x) + Integral(b**2*c**4*x
*asin(c*x)**2, x) + Integral(-4*a*b*c**2*asin(c*x)/x, x) + Integral(2*a*b*c
**4*x*asin(c*x), x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x^3}\,dx = \int \frac{(c^2dx^2-d)^2(b\arcsin(cx)+a)^2}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*c^4*d^2*x^2 - 2*a^2*c^2*d^2*log(x) - a*b*d^2*(sqrt(-c^2*x^2 + 1)*c/
x + arcsin(c*x)/x^2) - 1/2*a^2*d^2/x^2 + integrate(((b^2*c^4*d^2*x^4 - 2*b^
2*c^2*d^2*x^2 + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(
a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)))/x^3, x)
```

Giac [F]

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x^3}\,dx = \int \frac{(c^2dx^2-d)^2(b\arcsin(cx)+a)^2}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)^2/x^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^2}{x^3}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x^3, x)
```

3.173 $\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x^4}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 268

$$\begin{aligned}\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x^4}\,dx = {} & -\frac{b^2c^2d^2}{3x}-2b^2c^4d^2x \\ & +\frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\ & -\frac{bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3x^2} \\ & +\frac{8}{3}c^4d^2x(a+b\arcsin(cx))^2 \\ & +\frac{4c^2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3x} \\ & -\frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3x^3} \\ & +\frac{22}{3}bc^3d^2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right) \\ & -\frac{11}{3}ib^2c^3d^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) \\ & +\frac{11}{3}ib^2c^3d^2\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)\end{aligned}$$

```
[Out] -1/3*b^2*c^2*d^2/x-2*b^2*c^4*d^2*x-1/3*b*c*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcs
in(c*x))/x^2+8/3*c^4*d^2*x*(a+b*arcsin(c*x))^2+4/3*c^2*d^2*(-c^2*x^2+1)*(a+
b*arcsin(c*x))^2/x-1/3*d^2*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/x^3+22/3*b*c^
3*d^2*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))-11/3*I*b^2*c^3*d^
2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+11/3*I*b^2*c^3*d^2*polylog(2,I*c*x+(
-c^2*x^2+1)^(1/2))+5/3*b*c^3*d^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.370, Rules used = {4785, 4715, 4767, 8, 4783, 4803, 4268, 2317, 2438, 14}

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x^4} \, dx = \frac{22}{3}bc^3d^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx)) + \frac{8}{3}c^4d^2x(a+b\arcsin(cx))^2 + \frac{4c^2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3x} - \frac{bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3x^2} - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3x^3} + \frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{11}{3}ib^2c^3d^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) + \frac{11}{3}ib^2c^3d^2\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right) - 2b^2c^4d^2x - \frac{b^2c^2d^2}{3x}$$

```
[In] Int[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -1/3*(b^2*c^2*d^2)/x - 2*b^2*c^4*d^2*x + (5*b*c^3*d^2*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/3 - (b*c*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*
x^2) + (8*c^4*d^2*x*(a + b*ArcSin[c*x])^2)/3 + (4*c^2*d^2*(1 - c^2*x^2)*(a
+ b*ArcSin[c*x])^2)/(3*x) - (d^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(3*
x^3) + (22*b*c^3*d^2*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/3 - ((
11*I)/3)*b^2*c^3*d^2*PolyLog[2, -E^(I*ArcSin[c*x])] + ((11*I)/3)*b^2*c^3*d^
2*PolyLog[2, E^(I*ArcSin[c*x])]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
```

```
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^2(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{3x^3} - \frac{1}{3}\left(4c^2d\right)\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x^2}\,dx \\
&\quad + \frac{1}{3}\left(2bcd^2\right)\int \frac{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{x^3}\,dx \\
&= -\frac{bcd^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{3x^2} \\
&\quad + \frac{4c^2d^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3x} - \frac{d^2(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{3x^3} \\
&\quad + \frac{1}{3}\left(b^2c^2d^2\right)\int \frac{1-c^2x^2}{x^2}\,dx - \left(bc^3d^2\right)\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x}\,dx \\
&\quad - \frac{1}{3}\left(8bc^3d^2\right)\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x}\,dx + \frac{1}{3}\left(8c^4d^2\right)\int (a+b\arcsin(cx))^2\,dx \\
&= -\frac{11}{3}bc^3d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{3x^2} \\
&\quad + \frac{8}{3}c^4d^2x(a+b\arcsin(cx))^2 + \frac{4c^2d^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3x} \\
&\quad - \frac{d^2(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{3x^3} + \frac{1}{3}\left(b^2c^2d^2\right)\int \left(-c^2+\frac{1}{x^2}\right)dx \\
&\quad - \left(bc^3d^2\right)\int \frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx - \frac{1}{3}\left(8bc^3d^2\right)\int \frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx \\
&\quad + \left(b^2c^4d^2\right)\int 1\,dx + \frac{1}{3}\left(8b^2c^4d^2\right)\int 1\,dx - \frac{1}{3}\left(16bc^5d^2\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx
\end{aligned}$$

$$= -\frac{b^2c^2d^2}{3x} + \frac{10}{3}b^2c^4d^2x + \frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3x^2} + \frac{8}{3}c^4d^2x(a+b\arcsin(cx))^2 + \frac{4c^2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3x} - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3x^3} - (bc^3d^2)\,\text{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \arcsin(cx)\right) - \frac{1}{3}(8bc^3d^2)\,\text{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \arcsin(cx)\right) - \frac{1}{3}(16b^2c^4d^2)\int 1\,dx$$

$$= -\frac{b^2c^2d^2}{3x} - 2b^2c^4d^2x + \frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3x^2} + \frac{8}{3}c^4d^2x(a+b\arcsin(cx))^2 + \frac{4c^2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3x} - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3x^3} + \frac{22}{3}bc^3d^2(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right) + (b^2c^3d^2)\,\text{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right) - (b^2c^3d^2)\,\text{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right) + \frac{1}{3}(8b^2c^3d^2)\,\text{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right) - \frac{1}{3}(8b^2c^3d^2)\,\text{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)$$

$$= -\frac{b^2c^2d^2}{3x} - 2b^2c^4d^2x + \frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3x^2} + \frac{8}{3}c^4d^2x(a+b\arcsin(cx))^2 + \frac{4c^2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3x} - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3x^3} + \frac{22}{3}bc^3d^2(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right) - (ib^2c^3d^2)\,\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right) + (ib^2c^3d^2)\,\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(cx)}\right) - \frac{1}{3}(8ib^2c^3d^2)\,\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right) + \frac{1}{3}(8ib^2c^3d^2)\,\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)$$

$$
\begin{aligned}
&= -\frac{b^2c^2d^2}{3x} - 2b^2c^4d^2x + \frac{5}{3}bc^3d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad - \frac{bcd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3x^2} \\
&\quad + \frac{8}{3}c^4d^2x(a+b\arcsin(cx))^2 + \frac{4c^2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3x} \\
&\quad - \frac{d^2(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3x^3} + \frac{22}{3}bc^3d^2(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right) \\
&\quad - \frac{11}{3}ib^2c^3d^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) + \frac{11}{3}ib^2c^3d^2\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.63 (sec) , antiderivative size = 374, normalized size of antiderivative = 1.40

$$
\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x^4}\,dx
= \frac{d^2\left(-a^2+6a^2c^2x^2-b^2c^2x^2+3a^2c^4x^4-6b^2c^4x^4-abcx\sqrt{1-c^2x^2}+6abc^3x^3\sqrt{1-c^2x^2}-2ab\arcsin(cx)\right.}{}
$$

```
[In] Integrate[((d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (d^2*(-a^2 + 6*a^2*c^2*x^2 - b^2*c^2*x^2 + 3*a^2*c^4*x^4 - 6*b^2*c^4*x^4 -
a*b*c*x*Sqrt[1 - c^2*x^2] + 6*a*b*c^3*x^3*Sqrt[1 - c^2*x^2] - 2*a*b*ArcSin[
c*x] + 12*a*b*c^2*x^2*ArcSin[c*x] + 6*a*b*c^4*x^4*ArcSin[c*x] - b^2*c*x*Sqr
t[1 - c^2*x^2]*ArcSin[c*x] + 6*b^2*c^3*x^3*Sqrt[1 - c^2*x^2]*ArcSin[c*x] -
b^2*ArcSin[c*x]^2 + 6*b^2*c^2*x^2*ArcSin[c*x]^2 + 3*b^2*c^4*x^4*ArcSin[c*x]
^2 + 11*a*b*c^3*x^3*ArcTanh[Sqrt[1 - c^2*x^2]] - 11*b^2*c^3*x^3*ArcSin[c*x]
*Log[1 - E^(I*ArcSin[c*x])] + 11*b^2*c^3*x^3*ArcSin[c*x]*Log[1 + E^(I*ArcSi
n[c*x])] - (11*I)*b^2*c^3*x^3*PolyLog[2, -E^(I*ArcSin[c*x])] + (11*I)*b^2*c
^3*x^3*PolyLog[2, E^(I*ArcSin[c*x])]))/(3*x^3)
```

Maple [A] (verified)

Time = 0.23 (sec) , antiderivative size = 378, normalized size of antiderivative = 1.41

method	result
derivativedivides	$c^3\left(d^2a^2\left(cx-\frac{1}{3c^3x^3}+\frac{2}{cx}\right)+2d^2b^2\arcsin\left(cx\right)\sqrt{-c^2x^2+1}+d^2b^2\arcsin\left(cx\right)^2cx-2d^2b^2c\right.$
default	$c^3\left(d^2a^2\left(cx-\frac{1}{3c^3x^3}+\frac{2}{cx}\right)+2d^2b^2\arcsin\left(cx\right)\sqrt{-c^2x^2+1}+d^2b^2\arcsin\left(cx\right)^2cx-2d^2b^2c\right.$
parts	$d^2a^2\left(c^4x+\frac{2c^2}{x}-\frac{1}{3x^3}\right)+2d^2b^2c^3\sqrt{-c^2x^2+1}\,\arcsin\left(cx\right)+d^2b^2c^4\arcsin\left(cx\right)^2x-2b^2c^4c$

[In] int((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^4,x,method=_RETURNVERBOSE)

[Out] c^3*(d^2*a^2*(c*x-1/3/c^3/x^3+2/c/x)+2*d^2*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+d^2*b^2*arcsin(c*x)^2*c*x-2*d^2*b^2*c*x+2*d^2*b^2/c/x*arcsin(c*x)^2-1/3*d^2*b^2/c^2/x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-1/3*d^2*b^2/c^3/x^3*arcsin(c*x)^2-1/3*d^2*b^2/c/x+11/3*d^2*b^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-11/3*I*d^2*b^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-11/3*d^2*b^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+11/3*I*d^2*b^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*d^2*a*b*(c*x*arcsin(c*x)-1/3/c^3/x^3*arcsin(c*x)+2/c/x*arcsin(c*x)+(-c^2*x^2+1)^(1/2)-1/6/c^2/x^2*(-c^2*x^2+1)^(1/2)+11/6*arctanh(1/(-c^2*x^2+1)^(1/2))))

Fricas [F]

$$\int\frac{\left(d-c^2dx^2\right)^2\left(a+b\arcsin(cx)\right)^2}{x^4}\,dx=\int\frac{\left(c^2dx^2-d\right)^2\left(b\arcsin\left(cx\right)+a\right)^2}{x^4}\,dx$$

[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas")

[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4 - 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))/x^4, x)

Sympy [F]

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x^4}\,dx = d^2\left(\int a^2c^4\,dx + \int \frac{a^2}{x^4}\,dx + \int \left(-\frac{2a^2c^2}{x^2}\right)\,dx + \int b^2c^4\operatorname{asin}^2(cx)\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{x^4}\,dx + \int 2abc^4\operatorname{asin}(cx)\,dx + \int \frac{2ab\operatorname{asin}(cx)}{x^4}\,dx + \int \left(-\frac{2b^2c^2\operatorname{asin}^2(cx)}{x^2}\right)\,dx + \int \left(-\frac{4abc^2\operatorname{asin}(cx)}{x^2}\right)\,dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2/x**4,x)
```

```
[Out] d**2*(Integral(a**2*c**4, x) + Integral(a**2/x**4, x) + Integral(-2*a**2*c*
*2/x**2, x) + Integral(b**2*c**4*asin(c*x)**2, x) + Integral(b**2*asin(c*x)
**2/x**4, x) + Integral(2*a*b*c**4*asin(c*x), x) + Integral(2*a*b*asin(c*x)
/x**4, x) + Integral(-2*b**2*c**2*asin(c*x)**2/x**2, x) + Integral(-4*a*b*c
**2*asin(c*x)/x**2, x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x^4}\,dx = \int \frac{(c^2dx^2-d)^2(b\arcsin(cx)+a)^2}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima")
```

```
[Out] b^2*c^4*d^2*x*arcsin(c*x)^2 - 2*b^2*c^4*d^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(
c*x)/c) + a^2*c^4*d^2*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c^3*
d^2 + 4*(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b
*c^2*d^2 - 1/3*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^
2*x^2 + 1)/x^2)*c + 2*arcsin(c*x)/x^3)*a*b*d^2 + 2*a^2*c^2*d^2/x - 1/3*a^2*
d^2/x^3 + 1/3*(3*x^3*integrate(2/3*(6*b^2*c^3*d^2*x^2 - b^2*c*d^2)*sqrt(c*x
 + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^5 -
x^3), x) + (6*b^2*c^2*d^2*x^2 - b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))^2)/x^3
```

Giac [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x^4}\,dx = \text{Timed out}$$

```
[In] integrate((-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^2 (a+b\arcsin(cx))^2}{x^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^2}{x^4}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x^4,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^2)/x^4, x)
```

3.174 $\int x^4 (d-c^2dx^2)^3 (a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 27, antiderivative size = 476

$$\int x^4 (d-c^2dx^2)^3 (a+b\arcsin(cx))^2\,dx = -\frac{100976b^2d^3x}{4002075c^4} - \frac{50488b^2d^3x^3}{12006225c^2} - \frac{12622b^2d^3x^5}{6670125} + \frac{9410b^2c^2d^3x^7}{1120581} - \frac{182b^2c^4d^3x^9}{29403} + \frac{2b^2c^6d^3x^{11}}{1331} + \frac{256bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{17325c^5} + \frac{128bd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{17325c^3} + \frac{32bd^3x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{5775c} + \frac{16bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{693c^5} - \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{1155c^5} + \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{1617c^5} - \frac{8bd^3(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{297c^5} + \frac{2bd^3(1-c^2x^2)^{11/2}(a+b\arcsin(cx))}{121c^5} + \frac{16d^3x^5(a+b\arcsin(cx))^2}{1155} + \frac{8}{231}d^3x^5(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{2}{33}d^3x^5(1-c^2x^2)^2(a+b\arcsin(cx))^2 + \frac{1}{11}d^3x^5(1-c^2x^2)^3(a+b\text{ar}$$

```
[Out] -100976/4002075*b^2*d^3*x/c^4-50488/12006225*b^2*d^3*x^3/c^2-12622/6670125*
b^2*d^3*x^5+9410/1120581*b^2*c^2*d^3*x^7-182/29403*b^2*c^4*d^3*x^9+2/1331*b
^2*c^6*d^3*x^11+16/693*b*d^3*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c^5-4/115
5*b*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))/c^5+2/1617*b*d^3*(-c^2*x^2+1)^
(7/2)*(a+b*arcsin(c*x))/c^5-8/297*b*d^3*(-c^2*x^2+1)^(9/2)*(a+b*arcsin(c*x)
)/c^5+2/121*b*d^3*(-c^2*x^2+1)^(11/2)*(a+b*arcsin(c*x))/c^5+16/1155*d^3*x^5
*(a+b*arcsin(c*x))^2+8/231*d^3*x^5*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+2/33*d^
3*x^5*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2+1/11*d^3*x^5*(-c^2*x^2+1)^3*(a+b*a
rcsin(c*x))^2+256/17325*b*d^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^5+128/
17325*b*d^3*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+32/5775*b*d^3*x^4*
(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.65 (sec) , antiderivative size = 476, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.407, Rules used = {4787, 4723, 4795, 4767, 8, 30, 272, 45, 4779, 12, 1167}

$$\begin{aligned}\int x^4\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))^2\,dx = {} & \frac{1}{11}d^3x^5\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2 \\ & +\frac{2}{33}d^3x^5\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 \\ & +\frac{8}{231}d^3x^5\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\ & +\frac{32bd^3x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{5775c} \\ & +\frac{2bd^3\left(1-c^2x^2\right)^{11/2}(a+b\arcsin(cx))}{121c^5} \\ & -\frac{8bd^3\left(1-c^2x^2\right)^{9/2}(a+b\arcsin(cx))}{297c^5} \\ & +\frac{2bd^3\left(1-c^2x^2\right)^{7/2}(a+b\arcsin(cx))}{1617c^5} \\ & -\frac{4bd^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{1155c^5} \\ & +\frac{16bd^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))}{693c^5} \\ & +\frac{256bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{17325c^5} \\ & +\frac{128bd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{17325c^3} \\ & +\frac{16d^3x^5(a+b\arcsin(cx))^2}{1155}+\frac{2b^2c^6d^3x^{11}}{1331} \\ & -\frac{182b^2c^4d^3x^9}{29403}-\frac{100976b^2d^3x}{4002075c^4}+\frac{9410b^2c^2d^3x^7}{1120581} \\ & -\frac{50488b^2d^3x^3}{12006225c^2}-\frac{12622b^2d^3x^5}{6670125}\end{aligned}$$

```
[In] Int[x^4*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-100976*b^2*d^3*x)/(4002075*c^4) - (50488*b^2*d^3*x^3)/(12006225*c^2) - (1
2622*b^2*d^3*x^5)/6670125 + (9410*b^2*c^2*d^3*x^7)/1120581 - (182*b^2*c^4*d
^3*x^9)/29403 + (2*b^2*c^6*d^3*x^11)/1331 + (256*b*d^3*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/(17325*c^5) + (128*b*d^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x]))/(17325*c^3) + (32*b*d^3*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
]))/(5775*c) + (16*b*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(693*c^5)
 - (4*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(1155*c^5) + (2*b*d^3*
```

```
(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(1617*c^5) - (8*b*d^3*(1 - c^2*x^2
)^(9/2)*(a + b*ArcSin[c*x]))/(297*c^5) + (2*b*d^3*(1 - c^2*x^2)^(11/2)*(a +
 b*ArcSin[c*x]))/(121*c^5) + (16*d^3*x^5*(a + b*ArcSin[c*x])^2)/1155 + (8*d
^3*x^5*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/231 + (2*d^3*x^5*(1 - c^2*x^2)^
2*(a + b*ArcSin[c*x])^2)/33 + (d^3*x^5*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^
2)/11
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{1}{11}d^3x^5\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2\\&\quad+\frac{1}{11}(6d)\int x^4\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2\,dx\\&\quad-\frac{1}{11}\left(2bcd^3\right)\int x^5\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx\end{aligned}$$

$$= \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{77c^5} - \frac{4bd^3(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{99c^5} + \frac{2bd^3(1-c^2x^2)^{11/2}(a+b\arcsin(cx))}{121c^5} + \frac{2}{33}d^3x^5(1-c^2x^2)^2(a+b\arcsin(cx))^2 + \frac{1}{11}d^3x^5(1-c^2x^2)^3(a+b\arcsin(cx))^2 + \frac{1}{33}(8d^2)\int x^4(d-$$

$$= \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{165c^5} - \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{231c^5} - \frac{8bd^3(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{297c^5} + \frac{2bd^3(1-c^2x^2)^{11/2}(a+b\arcsin(cx))}{121c^5} + \frac{8}{231}d^3x^5(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{2}{33}d^3x^5(1-c^2x^2)^2(a+b\arcsin(cx))^2 + \frac{1}{11}d^3x^5(1-c^2x^2)^3$$

$$= \frac{16bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{693c^5} - \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{1155c^5} + \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{1617c^5} - \frac{8bd^3(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{297c^5} + \frac{2bd^3(1-c^2x^2)^{11/2}(a+b\arcsin(cx))}{121c^5} + \frac{16d^3x^5(a+b\arcsin(cx))^2}{1155} + \frac{8}{231}d^3x^5(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{2}{33}d^3x^5(1-c^2x^2)^2(a+b\arcsin(cx))^2 + \frac{1}{11}d^3x^5(1-c^2x^2)^3$$

$$= -\frac{16b^2d^3x}{7623c^4} - \frac{8b^2d^3x^3}{22869c^2} - \frac{2b^2d^3x^5}{12705} + \frac{226b^2c^2d^3x^7}{53361} - \frac{46b^2c^4d^3x^9}{9801} + \frac{2b^2c^6d^3x^{11}}{1331} + \frac{32bd^3x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{5775c} + \frac{16bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{693c^5} - \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{1155c^5} + \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{1617c^5} - \frac{8bd^3(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{297c^5} + \frac{2bd^3(1-c^2x^2)^{11/2}(a+b\arcsin(cx))}{121c^5} + \frac{16d^3x^5(a+b\arcsin(cx))^2}{1155} + \frac{8}{231}d^3x^5(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{2}{33}d^3x^5(1-c^2x^2)^2(a+b\arcsin(cx))^2 + \frac{1}{11}d^3x^5(1-c^2x^2)^3$$

$$= -\frac{8368b^2d^3x}{800415c^4} - \frac{4184b^2d^3x^3}{2401245c^2} - \frac{12622b^2d^3x^5}{6670125} + \frac{9410b^2c^2d^3x^7}{1120581} - \frac{182b^2c^4d^3x^9}{29403} + \frac{2b^2c^6d^3x^{11}}{1331} + \frac{128bd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{17325c^3} + \frac{32bd^3x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{5775c} + \frac{16bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{693c^5} - \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{1155c^5} + \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{1617c^5} - \frac{8bd^3(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{297c^5} + \frac{2bd^3(1-c^2x^2)^{11/2}(a+b\arcsin(cx))}{121c^5} + \frac{16d^3x^5(a+b\arcsin(cx))^2}{1155} + \frac{8}{231}d^3x^5(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{2}{33}d^3x^5(1-c^2x^2)^2(a+b\arcsin(cx))^2 + \frac{1}{11}d^3x^5(1-c^2x^2)^3(a$$

$$= -\frac{8368b^2d^3x}{800415c^4} - \frac{50488b^2d^3x^3}{12006225c^2} - \frac{12622b^2d^3x^5}{6670125} + \frac{9410b^2c^2d^3x^7}{1120581} - \frac{182b^2c^4d^3x^9}{29403} + \frac{2b^2c^6d^3x^{11}}{1331} + \frac{256bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{17325c^5} + \frac{128bd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{17325c^3} + \frac{32bd^3x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{5775c} + \frac{16bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{693c^5} - \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{1155c^5} + \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{1617c^5} - \frac{8bd^3(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{297c^5} + \frac{2bd^3(1-c^2x^2)^{11/2}(a+b\arcsin(cx))}{121c^5} + \frac{16d^3x^5(a+b\arcsin(cx))^2}{1155} + \frac{8}{231}d^3x^5(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{2}{33}d^3x^5(1-c^2x^2)^2(a+b\arcsin(cx))^2 + \frac{1}{11}d^3x^5(1-c^2x^2)^3(a$$

$$= -\frac{100976b^2d^3x}{4002075c^4} - \frac{50488b^2d^3x^3}{12006225c^2} - \frac{12622b^2d^3x^5}{6670125} + \frac{9410b^2c^2d^3x^7}{1120581} - \frac{182b^2c^4d^3x^9}{29403} + \frac{2b^2c^6d^3x^{11}}{1331} + \frac{256bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{17325c^5} + \frac{128bd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{17325c^3} + \frac{32bd^3x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{5775c} + \frac{16bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{693c^5} - \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{1155c^5} + \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{1617c^5} - \frac{8bd^3(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{297c^5} + \frac{2bd^3(1-c^2x^2)^{11/2}(a+b\arcsin(cx))}{121c^5} + \frac{16d^3x^5(a+b\arcsin(cx))^2}{1155} + \frac{8}{231}d^3x^5(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{2}{33}d^3x^5(1-c^2x^2)^2(a+b\arcsin(cx))^2 + \frac{1}{11}d^3x^5(1-c^2x^2)^3(a$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 301, normalized size of antiderivative = 0.63

$$\int x^4(d-c^2dx^2)^3(a+b\arcsin(cx))^2\,dx = -\frac{d^3(12006225a^2c^5x^5(-231+495c^2x^2-385c^4x^4+105c^6x^6)+6930ab\sqrt{1-c^2x^2}(-50488-25244c^2x^2-}{}$$

```
[In] Integrate[x^4*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/13867189875*(d^3*(12006225*a^2*c^5*x^5*(-231 + 495*c^2*x^2 - 385*c^4*x^4
 + 105*c^6*x^6) + 6930*a*b*Sqrt[1 - c^2*x^2]*(-50488 - 25244*c^2*x^2 - 1893
3*c^4*x^4 + 117625*c^6*x^6 - 111475*c^8*x^8 + 33075*c^10*x^10) + b^2*(34988
1840*c*x + 58313640*c^3*x^3 + 26241138*c^5*x^5 - 116448750*c^7*x^7 + 858357
50*c^9*x^9 - 20837250*c^11*x^11) + 6930*b*(3465*a*c^5*x^5*(-231 + 495*c^2*x
^2 - 385*c^4*x^4 + 105*c^6*x^6) + b*Sqrt[1 - c^2*x^2]*(-50488 - 25244*c^2*x
^2 - 18933*c^4*x^4 + 117625*c^6*x^6 - 111475*c^8*x^8 + 33075*c^10*x^10))*Ar
cSin[c*x] + 12006225*b^2*c^5*x^5*(-231 + 495*c^2*x^2 - 385*c^4*x^4 + 105*c^
6*x^6)*ArcSin[c*x]^2))/c^5
```

Maple [A] (verified)

Time = 0.29 (sec) , antiderivative size = 671, normalized size of antiderivative = 1.41

method	result
parts	$-d^3a^2\left(\frac{1}{11}c^6x^{11}-\frac{1}{3}c^4x^9+\frac{3}{7}c^2x^7-\frac{1}{5}x^5\right)-\frac{d^3b^2\left(-\frac{4\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{1925}+\frac{\arcsin(cx)^2\left(5c^6x^6-\right.}{}\right.}{}$
derivativedivides	$\frac{-d^3a^2\left(\frac{1}{11}c^{11}x^{11}-\frac{1}{3}c^9x^9+\frac{3}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-d^3b^2\left(-\frac{4\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{1925}+\frac{\arcsin(cx)^2\left(5c^6x^6-21c^4x^4+35c^2x^2\right.}{35}\right.}{}$
default	$\frac{-d^3a^2\left(\frac{1}{11}c^{11}x^{11}-\frac{1}{3}c^9x^9+\frac{3}{7}c^7x^7-\frac{1}{5}c^5x^5\right)-d^3b^2\left(-\frac{4\arcsin(cx)\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}}{1925}+\frac{\arcsin(cx)^2\left(5c^6x^6-21c^4x^4+35c^2x^2\right.}{35}\right.}{}$

```
[In] int(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -d^3*a^2*(1/11*c^6*x^11-1/3*c^4*x^9+3/7*c^2*x^7-1/5*x^5)-d^3*b^2/c^5*(-4/19
25*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)+1/35*arcsin(c*x)^2*(5*c^6*x
^6-21*c^4*x^4+35*c^2*x^2-35)*c*x-32/1155*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+32/
1155*c*x+16/3465*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-8/93555*(35*c^8
*x^8-180*c^6*x^6+378*c^4*x^4-420*c^2*x^2+315)*c*x+2/1617*arcsin(c*x)*(c^2*x
^2-1)^3*(-c^2*x^2+1)^(1/2)-2/83853*(63*c^10*x^10-385*c^8*x^8+990*c^6*x^6-13
86*c^4*x^4+1155*c^2*x^2-693)*c*x+2/315*arcsin(c*x)^2*(35*c^8*x^8-180*c^6*x^
6+378*c^4*x^4-420*c^2*x^2+315)*c*x-2/56595*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2
```

```
-35)*c*x-16/10395*(c^2*x^2-3)*c*x+2/121*arcsin(c*x)*(c^2*x^2-1)^5*(-c^2*x^2
+1)^(1/2)+1/693*arcsin(c*x)^2*(63*c^10*x^10-385*c^8*x^8+990*c^6*x^6-1386*c^
4*x^4+1155*c^2*x^2-693)*c*x+4/28875*(3*c^4*x^4-10*c^2*x^2+15)*c*x+8/297*arc
sin(c*x)*(c^2*x^2-1)^4*(-c^2*x^2+1)^(1/2))-2*d^3*a*b/c^5*(1/11*arcsin(c*x)*
c^11*x^11-1/3*arcsin(c*x)*c^9*x^9+3/7*arcsin(c*x)*c^7*x^7-1/5*arcsin(c*x)*c
^5*x^5-91/3267*c^8*x^8*(-c^2*x^2+1)^(1/2)+4705/160083*c^6*x^6*(-c^2*x^2+1)^
(1/2)-6311/1334025*c^4*x^4*(-c^2*x^2+1)^(1/2)-25244/4002075*c^2*x^2*(-c^2*x
^2+1)^(1/2)-50488/4002075*(-c^2*x^2+1)^(1/2)+1/121*c^10*x^10*(-c^2*x^2+1)^(
1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 413, normalized size of antiderivative = 0.87

$$\int x^4 \left(d-c^2 d x^2\right)^3 (a+b \arcsin (c x))^2 \, dx = -\frac{10418625\,(121\,a^2-2\,b^2)c^{11}d^3x^{11}-471625\,(9801\,a^2-182\,b^2)c^9d^3x^9+12375\,(480249\,a^2-9410\,b^2)c^7d^3x^7}{}$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/13867189875*(10418625*(121*a^2 - 2*b^2)*c^11*d^3*x^11 - 471625*(9801*a^2
 - 182*b^2)*c^9*d^3*x^9 + 12375*(480249*a^2 - 9410*b^2)*c^7*d^3*x^7 - 2079*
(1334025*a^2 - 12622*b^2)*c^5*d^3*x^5 + 58313640*b^2*c^3*d^3*x^3 + 34988184
0*b^2*c*d^3*x + 12006225*(105*b^2*c^11*d^3*x^11 - 385*b^2*c^9*d^3*x^9 + 495
*b^2*c^7*d^3*x^7 - 231*b^2*c^5*d^3*x^5)*arcsin(c*x)^2 + 24012450*(105*a*b*c
^11*d^3*x^11 - 385*a*b*c^9*d^3*x^9 + 495*a*b*c^7*d^3*x^7 - 231*a*b*c^5*d^3*
x^5)*arcsin(c*x) + 6930*(33075*a*b*c^10*d^3*x^10 - 111475*a*b*c^8*d^3*x^8 +
 117625*a*b*c^6*d^3*x^6 - 18933*a*b*c^4*d^3*x^4 - 25244*a*b*c^2*d^3*x^2 - 5
0488*a*b*d^3 + (33075*b^2*c^10*d^3*x^10 - 111475*b^2*c^8*d^3*x^8 + 117625*b
^2*c^6*d^3*x^6 - 18933*b^2*c^4*d^3*x^4 - 25244*b^2*c^2*d^3*x^2 - 50488*b^2*
d^3)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] (verification not implemented)

Time = 2.98 (sec) , antiderivative size = 702, normalized size of antiderivative = 1.47

$$\int x^4 \left(d-c^2 d x^2\right)^3 (a+b \arcsin (c x))^2 \, dx = \begin{cases} -\frac{a^2c^6d^3x^{11}}{11} + \frac{a^2c^4d^3x^9}{3} - \frac{3a^2c^2d^3x^7}{7} + \frac{a^2d^3x^5}{5} - \frac{2abc^6d^3x^{11}\operatorname{asin}(cx)}{11} - \frac{2abc^5d^3x^{10}\sqrt{-c^2x^2+1}}{121} + \frac{2abc^4d^3x^9\operatorname{asin}(cx)}{3} + \frac{182abc^3}{} \\ \frac{a^2d^3x^5}{5} \end{cases}$$

```
[In] integrate(x**4*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**11/11 + a**2*c**4*d**3*x**9/3 - 3*a**2*c**2*d
**3*x**7/7 + a**2*d**3*x**5/5 - 2*a*b*c**6*d**3*x**11*asin(c*x)/11 - 2*a*b*
c**5*d**3*x**10*sqrt(-c**2*x**2 + 1)/121 + 2*a*b*c**4*d**3*x**9*asin(c*x)/3
 + 182*a*b*c**3*d**3*x**8*sqrt(-c**2*x**2 + 1)/3267 - 6*a*b*c**2*d**3*x**7*
asin(c*x)/7 - 9410*a*b*c*d**3*x**6*sqrt(-c**2*x**2 + 1)/160083 + 2*a*b*d**3
*x**5*asin(c*x)/5 + 12622*a*b*d**3*x**4*sqrt(-c**2*x**2 + 1)/(1334025*c) +
50488*a*b*d**3*x**2*sqrt(-c**2*x**2 + 1)/(4002075*c**3) + 100976*a*b*d**3*s
qrt(-c**2*x**2 + 1)/(4002075*c**5) - b**2*c**6*d**3*x**11*asin(c*x)**2/11 +
 2*b**2*c**6*d**3*x**11/1331 - 2*b**2*c**5*d**3*x**10*sqrt(-c**2*x**2 + 1)*
asin(c*x)/121 + b**2*c**4*d**3*x**9*asin(c*x)**2/3 - 182*b**2*c**4*d**3*x**
9/29403 + 182*b**2*c**3*d**3*x**8*sqrt(-c**2*x**2 + 1)*asin(c*x)/3267 - 3*b
**2*c**2*d**3*x**7*asin(c*x)**2/7 + 9410*b**2*c**2*d**3*x**7/1120581 - 9410
*b**2*c*d**3*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x)/160083 + b**2*d**3*x**5*as
in(c*x)**2/5 - 12622*b**2*d**3*x**5/6670125 + 12622*b**2*d**3*x**4*sqrt(-c*
*2*x**2 + 1)*asin(c*x)/(1334025*c) - 50488*b**2*d**3*x**3/(12006225*c**2) +
 50488*b**2*d**3*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(4002075*c**3) - 10097
6*b**2*d**3*x/(4002075*c**4) + 100976*b**2*d**3*sqrt(-c**2*x**2 + 1)*asin(c
*x)/(4002075*c**5), Ne(c, 0)), (a**2*d**3*x**5/5, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1141 vs. $2(421) = 842$.

Time = 0.32 (sec) , antiderivative size = 1141, normalized size of antiderivative = 2.40

$$\int x^4 (d - c^2 d x^2)^3 (a + b \arcsin(cx))^2 \, dx = \text{Too large to display}$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/11*b^2*c^6*d^3*x^11*arcsin(c*x)^2 - 1/11*a^2*c^6*d^3*x^11 + 1/3*b^2*c^4*
d^3*x^9*arcsin(c*x)^2 + 1/3*a^2*c^4*d^3*x^9 - 3/7*b^2*c^2*d^3*x^7*arcsin(c*
x)^2 - 3/7*a^2*c^2*d^3*x^7 - 2/7623*(693*x^11*arcsin(c*x) + (63*sqrt(-c^2*x
^2 + 1)*x^10/c^2 + 70*sqrt(-c^2*x^2 + 1)*x^8/c^4 + 80*sqrt(-c^2*x^2 + 1)*x^
6/c^6 + 96*sqrt(-c^2*x^2 + 1)*x^4/c^8 + 128*sqrt(-c^2*x^2 + 1)*x^2/c^10 + 2
56*sqrt(-c^2*x^2 + 1)/c^12)*c)*a*b*c^6*d^3 - 2/26413695*(3465*(63*sqrt(-c^2
*x^2 + 1)*x^10/c^2 + 70*sqrt(-c^2*x^2 + 1)*x^8/c^4 + 80*sqrt(-c^2*x^2 + 1)*
x^6/c^6 + 96*sqrt(-c^2*x^2 + 1)*x^4/c^8 + 128*sqrt(-c^2*x^2 + 1)*x^2/c^10 +
 256*sqrt(-c^2*x^2 + 1)/c^12)*c*arcsin(c*x) - (19845*c^10*x^11 + 26950*c^8*
x^9 + 39600*c^6*x^7 + 66528*c^4*x^5 + 147840*c^2*x^3 + 887040*x)/c^10)*b^2*
c^6*d^3 + 1/5*b^2*d^3*x^5*arcsin(c*x)^2 + 2/945*(315*x^9*arcsin(c*x) + (35*
sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x
^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^
10)*c)*a*b*c^4*d^3 + 2/297675*(315*(35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt
(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 +
 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c*arcsin(c*x) - (1225*c^8*x^9 +
```

```
1800*c^6*x^7 + 3024*c^4*x^5 + 6720*c^2*x^3 + 40320*x)/c^8)*b^2*c^4*d^3 + 1/
5*a^2*d^3*x^5 - 6/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 +
 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2
*x^2 + 1)/c^8)*c)*a*b*c^2*d^3 - 2/8575*(105*(5*sqrt(-c^2*x^2 + 1)*x^6/c^2 +
 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2
*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7 + 126*c^4*x^5 + 280*c^2*x^3 + 16
80*x)/c^6)*b^2*c^2*d^3 + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x
^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*d^
3 + 2/1125*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4
 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*
x)/c^4)*b^2*d^3
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 865 vs. $2(421) = 842$.

Time = 0.34 (sec) , antiderivative size = 865, normalized size of antiderivative = 1.82

$$\int x^4 (d - c^2 d x^2)^3 (a + b \arcsin(cx))^2 \, dx = \text{Too large to display}$$

```
[In] integrate(x^4*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/11*a^2*c^6*d^3*x^11 + 1/3*a^2*c^4*d^3*x^9 - 3/7*a^2*c^2*d^3*x^7 + 1/5*a^
2*d^3*x^5 - 1/11*(c^2*x^2 - 1)^5*b^2*d^3*x*arcsin(c*x)^2/c^4 - 2/11*(c^2*x^
2 - 1)^5*a*b*d^3*x*arcsin(c*x)/c^4 - 4/33*(c^2*x^2 - 1)^4*b^2*d^3*x*arcsin(
c*x)^2/c^4 + 2/1331*(c^2*x^2 - 1)^5*b^2*d^3*x/c^4 - 8/33*(c^2*x^2 - 1)^4*a*
b*d^3*x*arcsin(c*x)/c^4 - 1/231*(c^2*x^2 - 1)^3*b^2*d^3*x*arcsin(c*x)^2/c^4
 - 2/121*(c^2*x^2 - 1)^5*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^5 + 428/3
23433*(c^2*x^2 - 1)^4*b^2*d^3*x/c^4 - 2/231*(c^2*x^2 - 1)^3*a*b*d^3*x*arcsi
n(c*x)/c^4 + 2/385*(c^2*x^2 - 1)^2*b^2*d^3*x*arcsin(c*x)^2/c^4 - 2/121*(c^2
*x^2 - 1)^5*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^5 - 8/297*(c^2*x^2 - 1)^4*sqrt(-c^
2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^5 - 148174/110937519*(c^2*x^2 - 1)^3*b^2*d
^3*x/c^4 + 4/385*(c^2*x^2 - 1)^2*a*b*d^3*x*arcsin(c*x)/c^4 - 8/1155*(c^2*x^
2 - 1)*b^2*d^3*x*arcsin(c*x)^2/c^4 - 8/297*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 +
1)*a*b*d^3/c^5 - 2/1617*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c
*x)/c^5 + 5487704/4622396625*(c^2*x^2 - 1)^2*b^2*d^3*x/c^4 - 16/1155*(c^2*x
^2 - 1)*a*b*d^3*x*arcsin(c*x)/c^4 + 16/1155*b^2*d^3*x*arcsin(c*x)^2/c^4 - 2
/1617*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^5 + 4/1925*(c^2*x^2 - 1)
^2*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^5 - 606416/13867189875*(c^2*x^2
 - 1)*b^2*d^3*x/c^4 + 32/1155*a*b*d^3*x*arcsin(c*x)/c^4 + 4/1925*(c^2*x^2 -
 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^5 + 16/3465*(-c^2*x^2 + 1)^(3/2)*b^2*d^3
*arcsin(c*x)/c^5 - 382986368/13867189875*b^2*d^3*x/c^4 + 16/3465*(-c^2*x^2
+ 1)^(3/2)*a*b*d^3/c^5 + 32/1155*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^5
 + 32/1155*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^5
```

Mupad [F(-1)]

Timed out.

$$\int x^4(d-c^2dx^2)^3(a+b\arcsin(cx))^2\,dx=\int x^4\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^3\,dx$$

```
[In] int(x^4*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3,x)
[Out] int(x^4*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3, x)
```

3.175 $\int x^3(d-c^2dx^2)^3 (a+b\arcsin(cx))^2 dx$

Optimal result

Integrand size = 27, antiderivative size = 384

$$\begin{aligned}\int x^3(d-c^2dx^2)^3 (a+b\arcsin(cx))^2 dx = &-\frac{79b^2d^3x^2}{5120c^2}-\frac{79b^2d^3x^4}{15360}+\frac{401b^2c^2d^3x^6}{28800}\\&-\frac{57b^2c^4d^3x^8}{6400}+\frac{1}{500}b^2c^6d^3x^{10}\\&+\frac{79bd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2560c^3}\\&+\frac{79bd^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3840c}\\&-\frac{31}{960}bcd^3x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))\\&-\frac{1}{32}bcd^3x^5(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\\&-\frac{1}{50}bcd^3x^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\\&-\frac{79d^3(a+b\arcsin(cx))^2}{5120c^4}\\&+\frac{1}{40}d^3x^4(a+b\arcsin(cx))^2\\&+\frac{1}{20}d^3x^4(1-c^2x^2)(a+b\arcsin(cx))^2\\&+\frac{3}{40}d^3x^4(1-c^2x^2)^2(a+b\arcsin(cx))^2\\&+\frac{1}{10}d^3x^4(1-c^2x^2)^3(a+b\arcsin(cx))^2\end{aligned}$$

```
[Out] -79/5120*b^2*d^3*x^2/c^2-79/15360*b^2*d^3*x^4+401/28800*b^2*c^2*d^3*x^6-57/
6400*b^2*c^4*d^3*x^8+1/500*b^2*c^6*d^3*x^10-1/32*b*c*d^3*x^5*(-c^2*x^2+1)^(
3/2)*(a+b*arcsin(c*x))-1/50*b*c*d^3*x^5*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x)
```

```
)-79/5120*d^3*(a+b*arcsin(c*x))^2/c^4+1/40*d^3*x^4*(a+b*arcsin(c*x))^2+1/20
*d^3*x^4*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+3/40*d^3*x^4*(-c^2*x^2+1)^2*(a+b*
arcsin(c*x))^2+1/10*d^3*x^4*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2+79/2560*b*d^
3*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+79/3840*b*d^3*x^3*(a+b*arcsin(
c*x))*(-c^2*x^2+1)^(1/2)/c-31/960*b*c*d^3*x^5*(a+b*arcsin(c*x))*(-c^2*x^2+1
)^(1/2)
```

Rubi [A] (verified)

Time = 1.02 (sec) , antiderivative size = 384, normalized size of antiderivative = 1.00, number of steps used = 40, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4787, 4723, 4795, 4737, 30, 4783, 14, 272, 45}

$$\int x^3\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))^2\,dx = -\frac{79d^3(a+b\arcsin(cx))^2}{5120c^4} - \frac{1}{50}bcd^3x^5\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx)) - \frac{1}{32}bcd^3x^5\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{31}{960}bcd^3x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx)) + \frac{1}{10}d^3x^4\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2 + \frac{3}{40}d^3x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 + \frac{1}{20}d^3x^4\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{79bd^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3840c} + \frac{79bd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2560c^3} + \frac{1}{40}d^3x^4(a+b\arcsin(cx))^2 + \frac{1}{500}b^2c^6d^3x^{10} - \frac{57b^2c^4d^3x^8}{6400} + \frac{401b^2c^2d^3x^6}{28800} - \frac{79b^2d^3x^2}{5120c^2} - \frac{79b^2d^3x^4}{15360}$$

```
[In] Int[x^3*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-79*b^2*d^3*x^2)/(5120*c^2) - (79*b^2*d^3*x^4)/15360 + (401*b^2*c^2*d^3*x^
6)/28800 - (57*b^2*c^4*d^3*x^8)/6400 + (b^2*c^6*d^3*x^10)/500 + (79*b*d^3*x
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2560*c^3) + (79*b*d^3*x^3*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(3840*c) - (31*b*c*d^3*x^5*Sqrt[1 - c^2*x^2]
*(a + b*ArcSin[c*x]))/960 - (b*c*d^3*x^5*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[
c*x]))/32 - (b*c*d^3*x^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/50 - (79*
```

```
d^3*(a + b*ArcSin[c*x])^2)/(5120*c^4) + (d^3*x^4*(a + b*ArcSin[c*x])^2)/40
+ (d^3*x^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/20 + (3*d^3*x^4*(1 - c^2*x^
2)^2*(a + b*ArcSin[c*x])^2)/40 + (d^3*x^4*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x
])^2)/10
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
```

```
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{10}d^3x^4\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2+\frac{1}{5}(3d)\int x^3\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2\,dx \\
&\quad -\frac{1}{5}\left(bcd^3\right)\int x^4\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx \\
&= -\frac{1}{50}bcd^3x^5\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))+\frac{3}{40}d^3x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{10}d^3x^4\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{10}\left(3d^2\right)\int x^3\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx \\
&\quad -\frac{1}{10}\left(bcd^3\right)\int x^4\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx \\
&\quad -\frac{1}{20}\left(3bcd^3\right)\int x^4\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx+\frac{1}{50}\left(b^2c^2d^3\right)\int x^5\left(1-c^2x^2\right)^2\,dx
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{1}{32}bcd^3x^5\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) \\
&\quad -\frac{1}{50}bcd^3x^5\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))+\frac{1}{20}d^3x^4\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad +\frac{3}{40}d^3x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+\frac{1}{10}d^3x^4\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{10}d^3\int x^3(a+b\arcsin(cx))^2\,dx-\frac{1}{80}\left(3bcd^3\right)\int x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx \\
&\quad -\frac{1}{160}\left(9bcd^3\right)\int x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx \\
&\quad -\frac{1}{10}\left(bcd^3\right)\int x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx \\
&\quad +\frac{1}{100}\left(b^2c^2d^3\right)\text{Subst}\left(\int x^2\left(1-c^2x\right)^2\,dx,x,x^2\right) \\
&\quad +\frac{1}{80}\left(b^2c^2d^3\right)\int x^5\left(1-c^2x^2\right)\,dx+\frac{1}{160}\left(3b^2c^2d^3\right)\int x^5\left(1-c^2x^2\right)\,dx \\
&= -\frac{31}{960}bcd^3x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{1}{32}bcd^3x^5\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) \\
&\quad -\frac{1}{50}bcd^3x^5\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))+\frac{1}{40}d^3x^4(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{20}d^3x^4\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{3}{40}d^3x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{10}d^3x^4\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2-\frac{1}{160}\left(bcd^3\right)\int\frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad -\frac{1}{320}\left(3bcd^3\right)\int\frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{60}\left(bcd^3\right)\int\frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad -\frac{1}{20}\left(bcd^3\right)\int\frac{x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx+\frac{1}{160}\left(b^2c^2d^3\right)\int x^5\,dx \\
&\quad +\frac{1}{320}\left(3b^2c^2d^3\right)\int x^5\,dx+\frac{1}{100}\left(b^2c^2d^3\right)\text{Subst}\left(\int\left(x^2-2c^2x^3+c^4x^4\right)\,dx,x,x^2\right) \\
&\quad +\frac{1}{80}\left(b^2c^2d^3\right)\int\left(x^5-c^2x^7\right)\,dx+\frac{1}{60}\left(b^2c^2d^3\right)\int x^5\,dx \\
&\quad +\frac{1}{160}\left(3b^2c^2d^3\right)\int\left(x^5-c^2x^7\right)\,dx
\end{aligned}
$$

$$=\frac{401b^2c^2d^3x^6}{28800}-\frac{57b^2c^4d^3x^8}{6400}+\frac{1}{500}b^2c^6d^3x^{10}+\frac{79bd^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3840c}-\frac{31}{960}bcd^3x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{1}{32}bcd^3x^5\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))-\frac{1}{50}bcd^3x^5\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))+\frac{1}{40}d^3x^4(a+b\arcsin(cx))^2+\frac{1}{20}d^3x^4\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{3}{40}d^3x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+\frac{1}{10}d^3x^4\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2-\frac{1}{640}\left(b^2d^3\right)\int x^3\,dx-\frac{\left(3b^2d^3\right)\int x^3\,dx}{1280}-\frac{1}{240}\left(b^2d^3\right)\int x^3\,dx-\frac{1}{80}\left(b^2d^3\right)\int x^3\,dx-\frac{\left(3bd^3\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{640c}-\frac{\left(9bd^3\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{1280c}-\frac{\left(bd^3\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{80c}-\frac{\left(3bd^3\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{80c}$$

$$=-\frac{79b^2d^3x^4}{15360}+\frac{401b^2c^2d^3x^6}{28800}-\frac{57b^2c^4d^3x^8}{6400}+\frac{1}{500}b^2c^6d^3x^{10}+\frac{79bd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2560c^3}+\frac{79bd^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3840c}-\frac{31}{960}bcd^3x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{1}{32}bcd^3x^5\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))-\frac{1}{50}bcd^3x^5\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))+\frac{1}{40}d^3x^4(a+b\arcsin(cx))^2+\frac{1}{20}d^3x^4\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{3}{40}d^3x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+\frac{1}{10}d^3x^4\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2-\frac{\left(3bd^3\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{1280c^3}-\frac{\left(9bd^3\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2560c^3}-\frac{\left(bd^3\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{160c^3}-\frac{\left(3bd^3\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{160c^3}-\frac{\left(3b^2d^3\right)\int x\,dx}{1280c^2}-\frac{\left(9b^2d^3\right)\int x\,dx}{2560c^2}-\frac{\left(b^2d^3\right)\int x\,dx}{160c^2}-\frac{\left(3b^2d^3\right)\int x\,dx}{160c^2}$$

$$= -\frac{79b^2d^3x^2}{5120c^2} - \frac{79b^2d^3x^4}{15360} + \frac{401b^2c^2d^3x^6}{28800} - \frac{57b^2c^4d^3x^8}{6400} + \frac{1}{500}b^2c^6d^3x^{10} + \frac{79bd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2560c^3} + \frac{79bd^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3840c} - \frac{31}{960}bcd^3x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{1}{32}bcd^3x^5\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{1}{50}bcd^3x^5\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx)) - \frac{79d^3(a+b\arcsin(cx))^2}{5120c^4} + \frac{1}{40}d^3x^4(a+b\arcsin(cx))^2 + \frac{1}{20}d^3x^4\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{3}{40}d^3x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 + \frac{1}{10}d^3x^4\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 287, normalized size of antiderivative = 0.75

$$\int x^3\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))^2\,dx =$$

$$-\frac{d^3\left(cx\left(28800a^2c^3x^3(-10+20c^2x^2-15c^4x^4+4c^6x^6)+30ab\sqrt{1-c^2x^2}(-1185-790c^2x^2+3208c^4x^4-\right.\right.}{}$$

```
[In] Integrate[x^3*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/1152000*(d^3*(c*x*(28800*a^2*c^3*x^3*(-10 + 20*c^2*x^2 - 15*c^4*x^4 + 4*
c^6*x^6) + 30*a*b*Sqrt[1 - c^2*x^2]*(-1185 - 790*c^2*x^2 + 3208*c^4*x^4 - 2
736*c^6*x^6 + 768*c^8*x^8) + b^2*(17775*c*x + 5925*c^3*x^3 - 16040*c^5*x^5
+ 10260*c^7*x^7 - 2304*c^9*x^9)) + 30*b*(b*c*x*Sqrt[1 - c^2*x^2]*(-1185 - 7
90*c^2*x^2 + 3208*c^4*x^4 - 2736*c^6*x^6 + 768*c^8*x^8) + 15*a*(79 - 1280*c
^4*x^4 + 2560*c^6*x^6 - 1920*c^8*x^8 + 512*c^10*x^10))*ArcSin[c*x] + 225*b^
2*(79 - 1280*c^4*x^4 + 2560*c^6*x^6 - 1920*c^8*x^8 + 512*c^10*x^10)*ArcSin[
c*x]^2))/c^4
```

Maple [A] (verified)

Time = 0.24 (sec) , antiderivative size = 518, normalized size of antiderivative = 1.35

method	result
parts	$-d^3a^2\left(\frac{1}{10}c^6x^{10}-\frac{3}{8}c^4x^8+\frac{1}{2}c^2x^6-\frac{1}{4}x^4\right)-\frac{d^3b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^4}{8}-\frac{\arcsin(cx)\left(-48c^7x^7\sqrt{-c^2x^2+1}+2\right.}{}\right.}{}$
derivativedivides	$\frac{-d^3a^2\left(\frac{1}{10}c^{10}x^{10}-\frac{3}{8}c^8x^8+\frac{1}{2}c^6x^6-\frac{1}{4}c^4x^4\right)-d^3b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^4}{8}-\frac{\arcsin(cx)\left(-48c^7x^7\sqrt{-c^2x^2+1}+200c^5x^5\sqrt{-c^2x^2}\right.}{}\right.}{}$
default	$\frac{-d^3a^2\left(\frac{1}{10}c^{10}x^{10}-\frac{3}{8}c^8x^8+\frac{1}{2}c^6x^6-\frac{1}{4}c^4x^4\right)-d^3b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^4}{8}-\frac{\arcsin(cx)\left(-48c^7x^7\sqrt{-c^2x^2+1}+200c^5x^5\sqrt{-c^2x^2}\right.}{}\right.}{}$

```
[In] int(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -d^3*a^2*(1/10*c^6*x^10-3/8*c^4*x^8+1/2*c^2*x^6-1/4*x^4)-d^3*b^2/c^4*(1/8*a
rcsin(c*x)^2*(c^2*x^2-1)^4-1/1536*arcsin(c*x)*(-48*c^7*x^7*(-c^2*x^2+1)^(1/
2)+200*c^5*x^5*(-c^2*x^2+1)^(1/2)-326*c^3*x^3*(-c^2*x^2+1)^(1/2)+279*c*x*(-
c^2*x^2+1)^(1/2)+105*arcsin(c*x))+49/5120*arcsin(c*x)^2-7/6400*(c^2*x^2-1)^
4+49/28800*(c^2*x^2-1)^3-49/15360*(c^2*x^2-1)^2+49/5120*c^2*x^2-49/5120+1/1
0*arcsin(c*x)^2*(c^2*x^2-1)^5+1/6400*arcsin(c*x)*(128*c^9*x^9*(-c^2*x^2+1)^
(1/2)-656*c^7*x^7*(-c^2*x^2+1)^(1/2)+1368*c^5*x^5*(-c^2*x^2+1)^(1/2)-1490*c
^3*x^3*(-c^2*x^2+1)^(1/2)+965*c*x*(-c^2*x^2+1)^(1/2)+315*arcsin(c*x))-1/500
*(c^2*x^2-1)^5)-2*d^3*a*b/c^4*(1/10*arcsin(c*x)*c^10*x^10-3/8*arcsin(c*x)*c
^8*x^8+1/2*arcsin(c*x)*c^6*x^6-1/4*c^4*x^4*arcsin(c*x)+1/100*c^9*x^9*(-c^2*
x^2+1)^(1/2)-57/1600*c^7*x^7*(-c^2*x^2+1)^(1/2)+401/9600*c^5*x^5*(-c^2*x^2+
1)^(1/2)-79/7680*c^3*x^3*(-c^2*x^2+1)^(1/2)-79/5120*c*x*(-c^2*x^2+1)^(1/2)+
79/5120*arcsin(c*x))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 395, normalized size of antiderivative = 1.03

$$\int x^3\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))^2\,dx = -\frac{2304\,(50\,a^2-b^2)c^{10}d^3x^{10}-540\,(800\,a^2-19\,b^2)c^8d^3x^8+40\,(14400\,a^2-401\,b^2)c^6d^3x^6-75\,(3840\,a^2-}{}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/1152000*(2304*(50*a^2 - b^2)*c^10*d^3*x^10 - 540*(800*a^2 - 19*b^2)*c^8*
d^3*x^8 + 40*(14400*a^2 - 401*b^2)*c^6*d^3*x^6 - 75*(3840*a^2 - 79*b^2)*c^4
*d^3*x^4 + 17775*b^2*c^2*d^3*x^2 + 225*(512*b^2*c^10*d^3*x^10 - 1920*b^2*c^
8*d^3*x^8 + 2560*b^2*c^6*d^3*x^6 - 1280*b^2*c^4*d^3*x^4 + 79*b^2*d^3)*arcsi
n(c*x)^2 + 450*(512*a*b*c^10*d^3*x^10 - 1920*a*b*c^8*d^3*x^8 + 2560*a*b*c^6
*d^3*x^6 - 1280*a*b*c^4*d^3*x^4 + 79*a*b*d^3)*arcsin(c*x) + 30*(768*a*b*c^9
```

```
*d^3*x^9 - 2736*a*b*c^7*d^3*x^7 + 3208*a*b*c^5*d^3*x^5 - 790*a*b*c^3*d^3*x^
3 - 1185*a*b*c*d^3*x + (768*b^2*c^9*d^3*x^9 - 2736*b^2*c^7*d^3*x^7 + 3208*b
^2*c^5*d^3*x^5 - 790*b^2*c^3*d^3*x^3 - 1185*b^2*c*d^3*x)*arcsin(c*x))*sqrt(
-c^2*x^2 + 1))/c^4
```

Sympy [A] (verification not implemented)

Time = 2.35 (sec) , antiderivative size = 654, normalized size of antiderivative = 1.70

$$\int x^3(d-c^2dx^2)^3(a+b\arcsin(cx))^2\,dx$$
$$=\begin{cases}-\frac{a^2c^6d^3x^{10}}{10}+\frac{3a^2c^4d^3x^8}{8}-\frac{a^2c^2d^3x^6}{2}+\frac{a^2d^3x^4}{4}-\frac{abc^6d^3x^{10}\operatorname{asin}(cx)}{5}-\frac{abc^5d^3x^9\sqrt{-c^2x^2+1}}{50}+\frac{3abc^4d^3x^8\operatorname{asin}(cx)}{4}+\frac{57abc^3d^3x^7}{80\ldots} \\ \frac{a^2d^3x^4}{4}\end{cases}$$

```
[In] integrate(x**3*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**10/10 + 3*a**2*c**4*d**3*x**8/8 - a**2*c**2*d
**3*x**6/2 + a**2*d**3*x**4/4 - a*b*c**6*d**3*x**10*asin(c*x)/5 - a*b*c**5*
d**3*x**9*sqrt(-c**2*x**2 + 1)/50 + 3*a*b*c**4*d**3*x**8*asin(c*x)/4 + 57*a
*b*c**3*d**3*x**7*sqrt(-c**2*x**2 + 1)/800 - a*b*c**2*d**3*x**6*asin(c*x) -
 401*a*b*c*d**3*x**5*sqrt(-c**2*x**2 + 1)/4800 + a*b*d**3*x**4*asin(c*x)/2
+ 79*a*b*d**3*x**3*sqrt(-c**2*x**2 + 1)/(3840*c) + 79*a*b*d**3*x*sqrt(-c**2
*x**2 + 1)/(2560*c**3) - 79*a*b*d**3*asin(c*x)/(2560*c**4) - b**2*c**6*d**3
*x**10*asin(c*x)**2/10 + b**2*c**6*d**3*x**10/500 - b**2*c**5*d**3*x**9*sqr
t(-c**2*x**2 + 1)*asin(c*x)/50 + 3*b**2*c**4*d**3*x**8*asin(c*x)**2/8 - 57*
b**2*c**4*d**3*x**8/6400 + 57*b**2*c**3*d**3*x**7*sqrt(-c**2*x**2 + 1)*asin
(c*x)/800 - b**2*c**2*d**3*x**6*asin(c*x)**2/2 + 401*b**2*c**2*d**3*x**6/28
800 - 401*b**2*c*d**3*x**5*sqrt(-c**2*x**2 + 1)*asin(c*x)/4800 + b**2*d**3*
x**4*asin(c*x)**2/4 - 79*b**2*d**3*x**4/15360 + 79*b**2*d**3*x**3*sqrt(-c**
2*x**2 + 1)*asin(c*x)/(3840*c) - 79*b**2*d**3*x**2/(5120*c**2) + 79*b**2*d*
*3*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2560*c**3) - 79*b**2*d**3*asin(c*x)**2
/(5120*c**4), Ne(c, 0)), (a**2*d**3*x**4/4, True))
```

Maxima [F]

$$\int x^3(d-c^2dx^2)^3(a+b\arcsin(cx))^2\,dx=\int-(c^2dx^2-d)^3(b\arcsin(cx)+a)^2x^3\,dx$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/10*a^2*c^6*d^3*x^10 + 3/8*a^2*c^4*d^3*x^8 - 1/2*a^2*c^2*d^3*x^6 - 1/6400
*(1280*x^10*arcsin(c*x) + (128*sqrt(-c^2*x^2 + 1)*x^9/c^2 + 144*sqrt(-c^2*x
^2 + 1)*x^7/c^4 + 168*sqrt(-c^2*x^2 + 1)*x^5/c^6 + 210*sqrt(-c^2*x^2 + 1)*x
```

```
^3/c^8 + 315*sqrt(-c^2*x^2 + 1)*x/c^10 - 315*arcsin(c*x)/c^11)*c)*a*b*c^6*d
^3 + 1/512*(384*x^8*arcsin(c*x) + (48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(
-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 +
 1)*x/c^8 - 105*arcsin(c*x)/c^9)*c)*a*b*c^4*d^3 + 1/4*a^2*d^3*x^4 - 1/48*(4
8*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x
^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*a*b*c^2*d^3 +
 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2
+ 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*d^3 - 1/40*(4*b^2*c^6*d^3*x^10 - 15*
b^2*c^4*d^3*x^8 + 20*b^2*c^2*d^3*x^6 - 10*b^2*d^3*x^4)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))^2 - integrate(1/20*(4*b^2*c^7*d^3*x^10 - 15*b^2*c^5*
d^3*x^8 + 20*b^2*c^3*d^3*x^6 - 10*b^2*c*d^3*x^4)*sqrt(c*x + 1)*sqrt(-c*x +
1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

Giac [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 631, normalized size of antiderivative = 1.64

$$\int x^3(d-c^2dx^2)^3(a+b\arcsin(cx))^2\,dx = -\frac{1}{10}a^2c^6d^3x^{10}+\frac{3}{8}a^2c^4d^3x^8-\frac{1}{2}a^2c^2d^3x^6+\frac{1}{4}a^2d^3x^4 - \frac{(c^2x^2-1)^4\sqrt{-c^2x^2+1}b^2d^3x\arcsin(cx)}{50\,c^3} - \frac{(c^2x^2-1)^5b^2d^3\arcsin(cx)^2}{10\,c^4} - \frac{(c^2x^2-1)^4\sqrt{-c^2x^2+1}abd^3x}{50\,c^3} - \frac{7\,(c^2x^2-1)^3\sqrt{-c^2x^2+1}b^2d^3x\arcsin(cx)}{800\,c^3} - \frac{(c^2x^2-1)^5abd^3\arcsin(cx)}{5\,c^4} - \frac{(c^2x^2-1)^4b^2d^3\arcsin(cx)^2}{8\,c^4} - \frac{7\,(c^2x^2-1)^3\sqrt{-c^2x^2+1}abd^3x}{800\,c^3} + \frac{49\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}b^2d^3x\arcsin(cx)}{4800\,c^3} + \frac{(c^2x^2-1)^5b^2d^3}{500\,c^4} - \frac{(c^2x^2-1)^4abd^3\arcsin(cx)}{4\,c^4} + \frac{49\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}abd^3x}{4800\,c^3} + \frac{49\,(-c^2x^2+1)^{\frac{3}{2}}b^2d^3x\arcsin(cx)}{3840\,c^3} + \frac{7\,(c^2x^2-1)^4b^2d^3}{6400\,c^4} + \frac{49\,(-c^2x^2+1)^{\frac{3}{2}}abd^3x}{3840\,c^3} + \frac{49\,\sqrt{-c^2x^2+1}b^2d^3x\arcsin(cx)}{2560\,c^3} - \frac{49\,(c^2x^2-1)^3b^2d^3}{28800\,c^4} + \frac{49\,\sqrt{-c^2x^2+1}abd^3x}{2560\,c^3} + \frac{49\,(c^2x^2-1)^2b^2d^3}{15360\,c^4} + \frac{49\,b^2d^3\arcsin(cx)^2}{5120\,c^4} - \frac{49\,(c^2x^2-1)b^2d^3}{5120\,c^4} + \frac{49\,abd^3\arcsin(cx)}{2560\,c^4} - \frac{232981\,b^2d^3}{36864000\,c^4}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/10*a^2*c^6*d^3*x^10 + 3/8*a^2*c^4*d^3*x^8 - 1/2*a^2*c^2*d^3*x^6 + 1/4*a^
2*d^3*x^4 - 1/50*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*arcsin(c*x)/c
```

```
^3 - 1/10*(c^2*x^2 - 1)^5*b^2*d^3*arcsin(c*x)^2/c^4 - 1/50*(c^2*x^2 - 1)^4*
sqrt(-c^2*x^2 + 1)*a*b*d^3*x/c^3 - 7/800*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)
*b^2*d^3*x*arcsin(c*x)/c^3 - 1/5*(c^2*x^2 - 1)^5*a*b*d^3*arcsin(c*x)/c^4 -
1/8*(c^2*x^2 - 1)^4*b^2*d^3*arcsin(c*x)^2/c^4 - 7/800*(c^2*x^2 - 1)^3*sqrt(
-c^2*x^2 + 1)*a*b*d^3*x/c^3 + 49/4800*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^
2*d^3*x*arcsin(c*x)/c^3 + 1/500*(c^2*x^2 - 1)^5*b^2*d^3/c^4 - 1/4*(c^2*x^2
- 1)^4*a*b*d^3*arcsin(c*x)/c^4 + 49/4800*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)
*a*b*d^3*x/c^3 + 49/3840*(-c^2*x^2 + 1)^(3/2)*b^2*d^3*x*arcsin(c*x)/c^3 + 7
/6400*(c^2*x^2 - 1)^4*b^2*d^3/c^4 + 49/3840*(-c^2*x^2 + 1)^(3/2)*a*b*d^3*x/
c^3 + 49/2560*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*arcsin(c*x)/c^3 - 49/28800*(c^2*
x^2 - 1)^3*b^2*d^3/c^4 + 49/2560*sqrt(-c^2*x^2 + 1)*a*b*d^3*x/c^3 + 49/1536
0*(c^2*x^2 - 1)^2*b^2*d^3/c^4 + 49/5120*b^2*d^3*arcsin(c*x)^2/c^4 - 49/5120
*(c^2*x^2 - 1)*b^2*d^3/c^4 + 49/2560*a*b*d^3*arcsin(c*x)/c^4 - 232981/36864
000*b^2*d^3/c^4
```

Mupad [F(-1)]

Timed out.

$$\int x^3 (d - c^2dx^2)^3 (a + b\arcsin(cx))^2 \, dx = \int x^3 (a + b\,\mathrm{asin}(c\,x))^2 \left(d - c^2\,d\,x^2\right)^3 \, dx$$

```
[In] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3,x)
[Out] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3, x)
```

3.176 $\int x^2(d-c^2dx^2)^3(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 27, antiderivative size = 391

$$\int x^2(d-c^2dx^2)^3(a+b\arcsin(cx))^2\,dx$$
$$= -\frac{10516b^2d^3x}{99225c^2} - \frac{5258b^2d^3x^3}{297675} + \frac{4198b^2c^2d^3x^5}{165375} - \frac{374b^2c^4d^3x^7}{27783} + \frac{2}{729}b^2c^6d^3x^9$$
$$+ \frac{64bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{945c^3} + \frac{32bd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{945c}$$
$$+ \frac{16bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{315c^3} + \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{525c^3}$$
$$+ \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{441c^3} - \frac{2bd^3(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{81c^3}$$
$$+ \frac{16}{315}d^3x^3(a+b\arcsin(cx))^2 + \frac{8}{105}d^3x^3(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{2}{21}d^3x^3(1-c^2x^2)^2(a+b\arcsin(cx))^2 +$$

```
[Out] -10516/99225*b^2*d^3*x/c^2-5258/297675*b^2*d^3*x^3+4198/165375*b^2*c^2*d^3*
x^5-374/27783*b^2*c^4*d^3*x^7+2/729*b^2*c^6*d^3*x^9+16/315*b*d^3*(-c^2*x^2+
1)^(3/2)*(a+b*arcsin(c*x))/c^3+4/525*b*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c
*x))/c^3+2/441*b*d^3*(-c^2*x^2+1)^(7/2)*(a+b*arcsin(c*x))/c^3-2/81*b*d^3*(-
c^2*x^2+1)^(9/2)*(a+b*arcsin(c*x))/c^3+16/315*d^3*x^3*(a+b*arcsin(c*x))^2+8
/105*d^3*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+2/21*d^3*x^3*(-c^2*x^2+1)^2*(
a+b*arcsin(c*x))^2+1/9*d^3*x^3*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2+64/945*b*
d^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+32/945*b*d^3*x^2*(a+b*arcsin(c
*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 391, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.407, Rules used = {4787, 4723, 4795, 4767, 8, 30, 272, 45, 4779, 12, 380}

$$\int x^2\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))^2\,dx=\frac{32bd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{945c}+\frac{1}{9}d^3x^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2+\frac{2}{21}d^3x^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+\frac{8}{105}d^3x^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2-\frac{2bd^3\left(1-c^2x^2\right)^{9/2}(a+b\arcsin(cx))}{81c^3}+\frac{2bd^3\left(1-c^2x^2\right)^{7/2}(a+b\arcsin(cx))}{441c^3}+\frac{4bd^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{525c^3}+\frac{16bd^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))}{315c^3}+\frac{64bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{945c^3}+\frac{16}{315}d^3x^3(a+b\arcsin(cx))^2+\frac{2}{729}b^2c^6d^3x^9-\frac{374b^2c^4d^3x^7}{27783}+\frac{4198b^2c^2d^3x^5}{165375}-\frac{10516b^2d^3x}{99225c^2}-\frac{5258b^2d^3x^3}{297675}$$

```
[In] Int[x^2*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-10516*b^2*d^3*x)/(99225*c^2) - (5258*b^2*d^3*x^3)/297675 + (4198*b^2*c^2*
d^3*x^5)/165375 - (374*b^2*c^4*d^3*x^7)/27783 + (2*b^2*c^6*d^3*x^9)/729 + (
64*b*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(945*c^3) + (32*b*d^3*x^2*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(945*c) + (16*b*d^3*(1 - c^2*x^2)^(3/
2)*(a + b*ArcSin[c*x]))/(315*c^3) + (4*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*Arc
Sin[c*x]))/(525*c^3) + (2*b*d^3*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(4
41*c^3) - (2*b*d^3*(1 - c^2*x^2)^(9/2)*(a + b*ArcSin[c*x]))/(81*c^3) + (16*
d^3*x^3*(a + b*ArcSin[c*x])^2)/315 + (8*d^3*x^3*(1 - c^2*x^2)*(a + b*ArcSin
[c*x])^2)/105 + (2*d^3*x^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/21 + (d^3
*x^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/9
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 380

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.), x_Symbol
] :> Int[ExpandIntegrand[(a + b*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a, b
, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[p, 0] && IGtQ[q, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
```

```
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{9}d^3x^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2+\frac{1}{3}(2d)\int x^2\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2\,dx \\
&\quad -\frac{1}{9}\left(2bcd^3\right)\int x^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx \\
&= \frac{2bd^3\left(1-c^2x^2\right)^{7/2}(a+b\arcsin(cx))}{63c^3}-\frac{2bd^3\left(1-c^2x^2\right)^{9/2}(a+b\arcsin(cx))}{81c^3} \\
&\quad +\frac{2}{21}d^3x^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+\frac{1}{9}d^3x^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{21}\left(8d^2\right)\int x^2\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx \\
&\quad -\frac{1}{21}\left(4bcd^3\right)\int x^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx+\frac{1}{9}\left(2b^2c^2d^3\right)\int\frac{\left(-2-7c^2x^2\right)\left(1-c^2x^2\right)^3}{63c^4}\,dx \\
&= \frac{4bd^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{105c^3} \\
&\quad +\frac{2bd^3\left(1-c^2x^2\right)^{7/2}(a+b\arcsin(cx))}{441c^3}-\frac{2bd^3\left(1-c^2x^2\right)^{9/2}(a+b\arcsin(cx))}{81c^3} \\
&\quad +\frac{8}{105}d^3x^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{2}{21}d^3x^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2+\frac{1}{9}d^3x^3\left(1-c^2x^2\right)^3(\\
&= \frac{16bd^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))}{315c^3}+\frac{4bd^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{525c^3} \\
&\quad +\frac{2bd^3\left(1-c^2x^2\right)^{7/2}(a+b\arcsin(cx))}{441c^3}-\frac{2bd^3\left(1-c^2x^2\right)^{9/2}(a+b\arcsin(cx))}{81c^3} \\
&\quad +\frac{16}{315}d^3x^3(a+b\arcsin(cx))^2+\frac{8}{105}d^3x^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{2}{21}d^3x^3\left(1-c^2x^2\right)^2(a+b\arcs
\end{aligned}$$

$$= -\frac{4b^2d^3x}{567c^2} - \frac{2b^2d^3x^3}{1701} + \frac{2}{189}b^2c^2d^3x^5 - \frac{38b^2c^4d^3x^7}{3969} + \frac{2}{729}b^2c^6d^3x^9 + \frac{32bd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{945c} + \frac{16bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{315c^3} + \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{525c^3} + \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{441c^3} - \frac{2bd^3(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{81c^3} + \frac{16}{315}d^3x^3(a+b\arcsin(cx))^2 + \frac{8}{105}d^3x^3(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{2}{21}d^3x^3(1-c^2x^2)^2(a+b\arcsin$$

$$= -\frac{3796b^2d^3x}{99225c^2} - \frac{5258b^2d^3x^3}{297675} + \frac{4198b^2c^2d^3x^5}{165375} - \frac{374b^2c^4d^3x^7}{27783} + \frac{2}{729}b^2c^6d^3x^9 + \frac{64bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{945c^3} + \frac{32bd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{945c} + \frac{16bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{315c^3} + \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{525c^3} + \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{441c^3} - \frac{2bd^3(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{81c^3} + \frac{16}{315}d^3x^3(a+b\arcsin(cx))^2 + \frac{8}{105}d^3x^3(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{2}{21}d^3x^3(1-c^2x^2)^2(a+b\arcsin$$

$$= -\frac{10516b^2d^3x}{99225c^2} - \frac{5258b^2d^3x^3}{297675} + \frac{4198b^2c^2d^3x^5}{165375} - \frac{374b^2c^4d^3x^7}{27783} + \frac{2}{729}b^2c^6d^3x^9 + \frac{64bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{945c^3} + \frac{32bd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{945c} + \frac{16bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{315c^3} + \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{525c^3} + \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{441c^3} - \frac{2bd^3(1-c^2x^2)^{9/2}(a+b\arcsin(cx))}{81c^3} + \frac{16}{315}d^3x^3(a+b\arcsin(cx))^2 + \frac{8}{105}d^3x^3(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{2}{21}d^3x^3(1-c^2x^2)^2(a+b\arcsin$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 277, normalized size of antiderivative = 0.71

$$\int x^2(d-c^2dx^2)^3(a+b\arcsin(cx))^2\,dx = -\frac{d^3(99225a^2c^3x^3(-105+189c^2x^2-135c^4x^4+35c^6x^6)+630ab\sqrt{1-c^2x^2}(-5258-2629c^2x^2+6297c^4x^4}{}$$

```
[In] Integrate[x^2*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

[Out] -1/31255875*(d^3*(99225*a^2*c^3*x^3*(-105 + 189*c^2*x^2 - 135*c^4*x^4 + 35*c^6*x^6) + 630*a*b*Sqrt[1 - c^2*x^2]*(-5258 - 2629*c^2*x^2 + 6297*c^4*x^4 - 4675*c^6*x^6 + 1225*c^8*x^8) + b^2*(3312540*c*x + 552090*c^3*x^3 - 793422*c^5*x^5 + 420750*c^7*x^7 - 85750*c^9*x^9) + 630*b*(315*a*c^3*x^3*(-105 + 189*c^2*x^2 - 135*c^4*x^4 + 35*c^6*x^6) + b*Sqrt[1 - c^2*x^2]*(-5258 - 2629*c^2*x^2 + 6297*c^4*x^4 - 4675*c^6*x^6 + 1225*c^8*x^8))*ArcSin[c*x] + 99225*b^2*c^3*x^3*(-105 + 189*c^2*x^2 - 135*c^4*x^4 + 35*c^6*x^6)*ArcSin[c*x]^2))/c^3

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 524, normalized size of antiderivative = 1.34

method	result
parts	$-d^3a^2\left(\frac{1}{9}c^6x^9-\frac{3}{7}c^4x^7+\frac{3}{5}c^2x^5-\frac{1}{3}x^3\right)-\frac{d^3b^2\left(\frac{\arcsin(cx)^2\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)cx}{35}+\frac{2\arcsin(cx)\left(c^2x\right.}{}\right.}{}$
derivativedivides	$\frac{-d^3a^2\left(\frac{1}{9}c^9x^9-\frac{3}{7}c^7x^7+\frac{3}{5}c^5x^5-\frac{1}{3}c^3x^3\right)-d^3b^2\left(\frac{\arcsin(cx)^2\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)cx}{35}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^3\sqrt{-c^2x^2}}{441}\right.}{}$
default	$\frac{-d^3a^2\left(\frac{1}{9}c^9x^9-\frac{3}{7}c^7x^7+\frac{3}{5}c^5x^5-\frac{1}{3}c^3x^3\right)-d^3b^2\left(\frac{\arcsin(cx)^2\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)cx}{35}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^3\sqrt{-c^2x^2}}{441}\right.}{}$

[In] int(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)

[Out] -d^3*a^2*(1/9*c^6*x^9-3/7*c^4*x^7+3/5*c^2*x^5-1/3*x^3)-d^3*b^2/c^3*(1/35*arcsin(c*x)^2*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x+2/441*arcsin(c*x)*(c^2*x^2-1)^3*(-c^2*x^2+1)^(1/2)-2/15435*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x-4/525*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)+4/7875*(3*c^4*x^4-10*c^2*x^2+15)*c*x+16/945*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-16/2835*(c^2*x^2-3)*c*x+32/315*c*x-32/315*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+1/315*arcsin(c*x)^2*(35*c^8*x^8-180*c^6*x^6+378*c^4*x^4-420*c^2*x^2+315)*c*x+2/81*arcsin(c*x)*(c^2*x^2-1)^4*(-c^2*x^2+1)^(1/2)-2/25515*(35*c^8*x^8-180*c^6*x^6+378*c^4*x^4-420*c^2*x^2+315)*c*x)-2*d^3*a*b/c^3*(1/9*arcsin(c*x)*c^9*x^9-3/7*arcsin(c*x)*c^7*x^7+3/5*arcsin(c*x)*c^5*x^5-1/3*c^3*x^3*arcsin(c*x)+1/81*c^8*x^8*(-c^2*x^2+1)^(1/2)-187/3969*c^6*x^6*(-c^2*x^2+1)^(1/2)+2099/33075*c^4*x^4*(-c^2*x^2+1)^(1/2)-2629/99225*c^2*x^2*(-c^2*x^2+1)^(1/2)-5258/99225*(-c^2*x^2+1)^(1/2))

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 372, normalized size of antiderivative = 0.95

$$\int x^2 \left(d - c^2 d x^2\right)^3 (a + b \arcsin(cx))^2 \, dx =$$
$$-\frac{42875\,(81\,a^2 - 2\,b^2)c^9d^3x^9 - 1125\,(11907\,a^2 - 374\,b^2)c^7d^3x^7 + 189\,(99225\,a^2 - 4198\,b^2)c^5d^3x^5 - 105\,(992}{}$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/31255875*(42875*(81*a^2 - 2*b^2)*c^9*d^3*x^9 - 1125*(11907*a^2 - 374*b^2
)*c^7*d^3*x^7 + 189*(99225*a^2 - 4198*b^2)*c^5*d^3*x^5 - 105*(99225*a^2 - 5
258*b^2)*c^3*d^3*x^3 + 3312540*b^2*c*d^3*x + 99225*(35*b^2*c^9*d^3*x^9 - 13
5*b^2*c^7*d^3*x^7 + 189*b^2*c^5*d^3*x^5 - 105*b^2*c^3*d^3*x^3)*arcsin(c*x)^
2 + 198450*(35*a*b*c^9*d^3*x^9 - 135*a*b*c^7*d^3*x^7 + 189*a*b*c^5*d^3*x^5
- 105*a*b*c^3*d^3*x^3)*arcsin(c*x) + 630*(1225*a*b*c^8*d^3*x^8 - 4675*a*b*c
^6*d^3*x^6 + 6297*a*b*c^4*d^3*x^4 - 2629*a*b*c^2*d^3*x^2 - 5258*a*b*d^3 + (
1225*b^2*c^8*d^3*x^8 - 4675*b^2*c^6*d^3*x^6 + 6297*b^2*c^4*d^3*x^4 - 2629*b
^2*c^2*d^3*x^2 - 5258*b^2*d^3)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A] (verification not implemented)

Time = 1.63 (sec) , antiderivative size = 626, normalized size of antiderivative = 1.60

$$\int x^2 \left(d - c^2 d x^2\right)^3 (a + b \arcsin(cx))^2 \, dx$$
$$= \begin{cases} -\frac{a^2c^6d^3x^9}{9} + \frac{3a^2c^4d^3x^7}{7} - \frac{3a^2c^2d^3x^5}{5} + \frac{a^2d^3x^3}{3} - \frac{2abc^6d^3x^9 \operatorname{asin}(cx)}{9} - \frac{2abc^5d^3x^8\sqrt{-c^2x^2+1}}{81} + \frac{6abc^4d^3x^7 \operatorname{asin}(cx)}{7} + \frac{374abc^3d^3}{} \\ \frac{a^2d^3x^3}{3} \end{cases}$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**9/9 + 3*a**2*c**4*d**3*x**7/7 - 3*a**2*c**2*d
**3*x**5/5 + a**2*d**3*x**3/3 - 2*a*b*c**6*d**3*x**9*asin(c*x)/9 - 2*a*b*c*
*5*d**3*x**8*sqrt(-c**2*x**2 + 1)/81 + 6*a*b*c**4*d**3*x**7*asin(c*x)/7 + 3
74*a*b*c**3*d**3*x**6*sqrt(-c**2*x**2 + 1)/3969 - 6*a*b*c**2*d**3*x**5*asin
(c*x)/5 - 4198*a*b*c*d**3*x**4*sqrt(-c**2*x**2 + 1)/33075 + 2*a*b*d**3*x**3
*asin(c*x)/3 + 5258*a*b*d**3*x**2*sqrt(-c**2*x**2 + 1)/(99225*c) + 10516*a*
b*d**3*sqrt(-c**2*x**2 + 1)/(99225*c**3) - b**2*c**6*d**3*x**9*asin(c*x)**2
/9 + 2*b**2*c**6*d**3*x**9/729 - 2*b**2*c**5*d**3*x**8*sqrt(-c**2*x**2 + 1)
*asin(c*x)/81 + 3*b**2*c**4*d**3*x**7*asin(c*x)**2/7 - 374*b**2*c**4*d**3*x
**7/27783 + 374*b**2*c**3*d**3*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x)/3969 - 3
*b**2*c**2*d**3*x**5*asin(c*x)**2/5 + 4198*b**2*c**2*d**3*x**5/165375 - 419
```

```
8*b**2*c*d**3*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/33075 + b**2*d**3*x**3*as
in(c*x)**2/3 - 5258*b**2*d**3*x**3/297675 + 5258*b**2*d**3*x**2*sqrt(-c**2*
x**2 + 1)*asin(c*x)/(99225*c) - 10516*b**2*d**3*x/(99225*c**2) + 10516*b**2
*d**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(99225*c**3), Ne(c, 0)), (a**2*d**3*x*
*3/3, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 946 vs. $2(346) = 692$.

Time = 0.32 (sec) , antiderivative size = 946, normalized size of antiderivative = 2.42

$$\int x^2(d-c^2dx^2)^3(a+b\arcsin(cx))^2\,dx = -\frac{1}{9}b^2c^6d^3x^9\arcsin(cx)^2$$
$$-\frac{1}{9}a^2c^6d^3x^9+\frac{3}{7}b^2c^4d^3x^7\arcsin(cx)^2+\frac{3}{7}a^2c^4d^3x^7-\frac{3}{5}b^2c^2d^3x^5\arcsin(cx)^2$$
$$-\frac{2}{2835}\left(315\,x^9\arcsin(cx)+\left(\frac{35\sqrt{-c^2x^2+1}x^8}{c^2}+\frac{40\sqrt{-c^2x^2+1}x^6}{c^4}+\frac{48\sqrt{-c^2x^2+1}x^4}{c^6}+\frac{64\sqrt{-c^2x^2}}{c^8}\right.\right.$$
$$-\frac{2}{893025}\left(315\left(\frac{35\sqrt{-c^2x^2+1}x^8}{c^2}+\frac{40\sqrt{-c^2x^2+1}x^6}{c^4}+\frac{48\sqrt{-c^2x^2+1}x^4}{c^6}+\frac{64\sqrt{-c^2x^2+1}x^2}{c^8}+\frac{128}{}\right.\right.$$
$$-\frac{3}{5}a^2c^2d^3x^5$$
$$+\frac{6}{245}\left(35\,x^7\arcsin(cx)+\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)\right.$$
$$+\frac{2}{8575}\left(105\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\arcsin(cx)-\right.$$
$$+\frac{1}{3}b^2d^3x^3\arcsin(cx)^2$$
$$-\frac{2}{25}\left(15\,x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abc^2d^3$$
$$-\frac{2}{375}\left(15\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\arcsin(cx)-\frac{9\,c^4x^5+20\,c^2x^3+12}{c^4}\right.$$
$$+\frac{1}{3}a^2d^3x^3+\frac{2}{9}\left(3\,x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abd^3$$
$$+\frac{2}{27}\left(3\,c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\arcsin(cx)-\frac{c^2x^3+6\,x}{c^2}\right)b^2d^3$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/9*b^2*c^6*d^3*x^9*arcsin(c*x)^2 - 1/9*a^2*c^6*d^3*x^9 + 3/7*b^2*c^4*d^3*
x^7*arcsin(c*x)^2 + 3/7*a^2*c^4*d^3*x^7 - 3/5*b^2*c^2*d^3*x^5*arcsin(c*x)^2
```

```
 - 2/2835*(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-
c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1
)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*a*b*c^6*d^3 - 2/893025*(315*(35
*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*
x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c
^10)*c*arcsin(c*x) - (1225*c^8*x^9 + 1800*c^6*x^7 + 3024*c^4*x^5 + 6720*c^2
*x^3 + 40320*x)/c^8)*b^2*c^6*d^3 - 3/5*a^2*c^2*d^3*x^5 + 6/245*(35*x^7*arcs
in(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*
sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^4*d^3 + 2/
8575*(105*(5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*
sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75
*c^6*x^7 + 126*c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2*c^4*d^3 + 1/3*b^2*d
^3*x^3*arcsin(c*x)^2 - 2/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4
/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^2*
d^3 - 2/375*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^
4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120
*x)/c^4)*b^2*c^2*d^3 + 1/3*a^2*d^3*x^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-
c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d^3 + 2/27*(3*c*(sqrt
(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 +
 6*x)/c^2)*b^2*d^3
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 716 vs. $2(346) = 692$.

Time = 0.34 (sec) , antiderivative size = 716, normalized size of antiderivative = 1.83

$$\int x^2 \left(d-c^2 d x^2\right)^3 (a+b \arcsin(cx))^2 \, dx = -\frac{1}{9} a^2 c^6 d^3 x^9 + \frac{3}{7} a^2 c^4 d^3 x^7 - \frac{3}{5} a^2 c^2 d^3 x^5 - \frac{(c^2x^2-1)^4 b^2 d^3 x \arcsin(cx)^2}{9 c^2} - \frac{2 (c^2x^2-1)^4 a b d^3 x \arcsin(cx)}{9 c^2} - \frac{(c^2x^2-1)^3 b^2 d^3 x \arcsin(cx)^2}{63 c^2} + \frac{2 (c^2x^2-1)^4 b^2 d^3 x}{729 c^2} + \frac{1}{3} a^2 d^3 x^3 - \frac{2 (c^2x^2-1)^3 a b d^3 x \arcsin(cx)}{63 c^2} + \frac{2 (c^2x^2-1)^2 b^2 d^3 x \arcsin(cx)^2}{105 c^2} - \frac{2 (c^2x^2-1)^4 \sqrt{-c^2x^2+1}\, b^2 d^3 \arcsin(cx)}{81 c^3} - \frac{622 (c^2x^2-1)^3 b^2 d^3 x}{250047 c^2} + \frac{4 (c^2x^2-1)^2 a b d^3 x \arcsin(cx)}{105 c^2} - \frac{8 (c^2x^2-1) b^2 d^3 x \arcsin(cx)^2}{315 c^2} - \frac{2 (c^2x^2-1)^4 \sqrt{-c^2x^2+1}\, a b d^3}{81 c^3} - \frac{2 (c^2x^2-1)^3 \sqrt{-c^2x^2+1}\, b^2 d^3 \arcsin(cx)}{441 c^3} + \frac{15224 (c^2x^2-1)^2 b^2 d^3 x}{10418625 c^2} - \frac{16 (c^2x^2-1) a b d^3 x \arcsin(cx)}{315 c^2} + \frac{16 b^2 d^3 x \arcsin(cx)^2}{315 c^2} - \frac{2 (c^2x^2-1)^3 \sqrt{-c^2x^2+1}\, a b d^3}{441 c^3} + \frac{4 (c^2x^2-1)^2 \sqrt{-c^2x^2+1}\, b^2 d^3 \arcsin(cx)}{525 c^3} + \frac{115504 (c^2x^2-1) b^2 d^3 x}{31255875 c^2} + \frac{32 a b d^3 x \arcsin(cx)}{315 c^2} + \frac{4 (c^2x^2-1)^2 \sqrt{-c^2x^2+1}\, a b d^3}{525 c^3} + \frac{16 (-c^2x^2+1)^{\frac{3}{2}} b^2 d^3 \arcsin(cx)}{945 c^3} - \frac{3406208 b^2 d^3 x}{31255875 c^2} + \frac{16 (-c^2x^2+1)^{\frac{3}{2}} a b d^3}{945 c^3} + \frac{32 \sqrt{-c^2x^2+1}\, b^2 d^3 \arcsin(cx)}{315 c^3}$$

[In] integrate(x^2*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")

[Out] -1/9*a^2*c^6*d^3*x^9 + 3/7*a^2*c^4*d^3*x^7 - 3/5*a^2*c^2*d^3*x^5 - 1/9*(c^2*x^2 - 1)^4*b^2*d^3*x*arcsin(c*x)^2/c^2 - 2/9*(c^2*x^2 - 1)^4*a*b*d^3*x*arcsin(c*x)/c^2 - 1/63*(c^2*x^2 - 1)^3*b^2*d^3*x*arcsin(c*x)^2/c^2 + 2/729*(c^2*x^2 - 1)^4*b^2*d^3*x/c^2 + 1/3*a^2*d^3*x^3 - 2/63*(c^2*x^2 - 1)^3*a*b*d^3*x*arcsin(c*x)/c^2 + 2/105*(c^2*x^2 - 1)^2*b^2*d^3*x*arcsin(c*x)^2/c^2 - 2/81*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^3 - 622/250047*(c^2*x^2 - 1)^3*b^2*d^3*x/c^2 + 4/105*(c^2*x^2 - 1)^2*a*b*d^3*x*arcsin(c*x)/c^2 - 8/315*(c^2*x^2 - 1)*b^2*d^3*x*arcsin(c*x)^2/c^2 - 2/81*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^3 - 2/441*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^3 + 15224/10418625*(c^2*x^2 - 1)^2*b^2*d^3*x/c^2 - 16/315*(c^2*x^2 - 1)*a*b*d^3*x*arcsin(c*x)/c^2 + 16/315*b^2*d^3*x*arcsin(c*x)^2/c^2 - 2/441*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^3 + 4/525*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^3 + 115504/31255875*(c^2*x^2 - 1)*b^2*d^3*x/c^2 + 32/315*a*b*d^3*x*arcsin(c*x)/c^2 + 4/525*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^3 + 16/945*(-c^2*x^2 + 1)^(3/2)*b^2*d^3*arcsin(c*x)/c^3 - 3406208/31255875*b^2*d^3*x/c^2 + 16/945*(-c^2*x^2 + 1)^(3/2)*a*b*d^3/c^3 + 32/315*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c^3 + 32/315*sqrt(-c^2*x^2 + 1)*a*b*d^3/c^3

Mupad [F(-1)]

Timed out.

$$\int x^2 (d-c^2dx^2)^3 (a+b\arcsin(cx))^2 \, dx = \int x^2 \left(a+b\,\mathrm{asin}(c\,x)\right)^2 \left(d-c^2\,d\,x^2\right)^3 \, dx$$

[In] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3,x)

[Out] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3, x)

3.177 $\int x(d-c^2dx^2)^3 (a+b\arcsin(cx))^2 \, dx$

Optimal result

Integrand size = 25, antiderivative size = 268

$$\int x(d-c^2dx^2)^3 (a+b\arcsin(cx))^2 \, dx = -\frac{175b^2d^3x^2}{3072} + \frac{35b^2c^2d^3x^4}{3072} + \frac{7b^2d^3(1-c^2x^2)^3}{1152c^2} + \frac{b^2d^3(1-c^2x^2)^4}{256c^2} + \frac{35bd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{512c} + \frac{35bd^3x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{768c} + \frac{7bd^3x(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{192c} + \frac{bd^3x(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{32c} + \frac{35d^3(a+b\arcsin(cx))^2}{1024c^2} - \frac{d^3(1-c^2x^2)^4(a+b\arcsin(cx))^2}{8c^2}$$

```
[Out] -175/3072*b^2*d^3*x^2+35/3072*b^2*c^2*d^3*x^4+7/1152*b^2*d^3*(-c^2*x^2+1)^3
/c^2+1/256*b^2*d^3*(-c^2*x^2+1)^4/c^2+35/768*b*d^3*x*(-c^2*x^2+1)^(3/2)*(a+
b*arcsin(c*x))/c+7/192*b*d^3*x*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))/c+1/32*
b*d^3*x*(-c^2*x^2+1)^(7/2)*(a+b*arcsin(c*x))/c+35/1024*d^3*(a+b*arcsin(c*x)
)^2/c^2-1/8*d^3*(-c^2*x^2+1)^4*(a+b*arcsin(c*x))^2/c^2+35/512*b*d^3*x*(a+b*
arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {4767, 4743, 4741, 4737, 30, 14, 267}

$$\int x\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))^2\,dx=\frac{bd^3x(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{32c}+\frac{7bd^3x(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{192c}+\frac{35bd^3x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{768c}+\frac{35bd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{512c}-\frac{d^3(1-c^2x^2)^4(a+b\arcsin(cx))^2}{8c^2}+\frac{35d^3(a+b\arcsin(cx))^2}{1024c^2}+\frac{35b^2c^2d^3x^4}{3072}+\frac{b^2d^3(1-c^2x^2)^4}{256c^2}+\frac{7b^2d^3(1-c^2x^2)^3}{1152c^2}-\frac{175b^2d^3x^2}{3072}$$

```
[In] Int[x*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-175*b^2*d^3*x^2)/3072 + (35*b^2*c^2*d^3*x^4)/3072 + (7*b^2*d^3*(1 - c^2*x
^2)^3)/(1152*c^2) + (b^2*d^3*(1 - c^2*x^2)^4)/(256*c^2) + (35*b*d^3*x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(512*c) + (35*b*d^3*x*(1 - c^2*x^2)^(3/2)
*(a + b*ArcSin[c*x]))/(768*c) + (7*b*d^3*x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSi
n[c*x]))/(192*c) + (b*d^3*x*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(32*c)
 + (35*d^3*(a + b*ArcSin[c*x])^2)/(1024*c^2) - (d^3*(1 - c^2*x^2)^4*(a + b*
ArcSin[c*x])^2)/(8*c^2)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
```

```
NeQ[p, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{d^3(1-c^2x^2)^4\,(a+b\arcsin(cx))^2}{8c^2}+\frac{(bd^3)\int(1-c^2x^2)^{7/2}\,(a+b\arcsin(cx))\,dx}{4c}\\ &= \frac{bd^3x(1-c^2x^2)^{7/2}\,(a+b\arcsin(cx))}{32c}-\frac{d^3(1-c^2x^2)^4\,(a+b\arcsin(cx))^2}{8c^2}\\ &\quad-\frac{1}{32}\left(b^2d^3\right)\int x\left(1-c^2x^2\right)^3\,dx+\frac{(7bd^3)\int(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))\,dx}{32c}\end{aligned}$$

$$
\begin{aligned}
&= \frac{b^2d^3(1-c^2x^2)^4}{256c^2} + \frac{7bd^3x(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}{192c} \\
&\quad + \frac{bd^3x(1-c^2x^2)^{7/2}\,(a+b\arcsin(cx))}{32c} - \frac{d^3(1-c^2x^2)^4\,(a+b\arcsin(cx))^2}{8c^2} \\
&\quad - \frac{1}{192}\left(7b^2d^3\right)\int x\left(1-c^2x^2\right)^2\,dx + \frac{(35bd^3)\int (1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\,dx}{192c}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{7b^2d^3(1-c^2x^2)^3}{1152c^2} + \frac{b^2d^3(1-c^2x^2)^4}{256c^2} + \frac{35bd^3x(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{768c} \\
&\quad + \frac{7bd^3x(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}{192c} \\
&\quad + \frac{bd^3x(1-c^2x^2)^{7/2}\,(a+b\arcsin(cx))}{32c} - \frac{d^3(1-c^2x^2)^4\,(a+b\arcsin(cx))^2}{8c^2} \\
&\quad - \frac{1}{768}\left(35b^2d^3\right)\int x\left(1-c^2x^2\right)\,dx + \frac{(35bd^3)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{256c}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{7b^2d^3(1-c^2x^2)^3}{1152c^2} + \frac{b^2d^3(1-c^2x^2)^4}{256c^2} + \frac{35bd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{512c} \\
&\quad + \frac{35bd^3x(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{768c} + \frac{7bd^3x(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}{192c} \\
&\quad + \frac{bd^3x(1-c^2x^2)^{7/2}\,(a+b\arcsin(cx))}{32c} - \frac{d^3(1-c^2x^2)^4\,(a+b\arcsin(cx))^2}{8c^2} \\
&\quad - \frac{1}{768}\left(35b^2d^3\right)\int \left(x-c^2x^3\right)\,dx - \frac{1}{512}\left(35b^2d^3\right)\int x\,dx + \frac{(35bd^3)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{512c}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{175b^2d^3x^2}{3072} + \frac{35b^2c^2d^3x^4}{3072} + \frac{7b^2d^3(1-c^2x^2)^3}{1152c^2} + \frac{b^2d^3(1-c^2x^2)^4}{256c^2} \\
&\quad + \frac{35bd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{512c} + \frac{35bd^3x(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{768c} \\
&\quad + \frac{7bd^3x(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}{192c} + \frac{bd^3x(1-c^2x^2)^{7/2}\,(a+b\arcsin(cx))}{32c} \\
&\quad + \frac{35d^3(a+b\arcsin(cx))^2}{1024c^2} - \frac{d^3(1-c^2x^2)^4\,(a+b\arcsin(cx))^2}{8c^2}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 257, normalized size of antiderivative = 0.96

$$\int x\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))^2\,dx =$$
$$-\frac{d^3\left(cx\left(b^2cx(837-489c^2x^2+200c^4x^4-36c^6x^6)+1152a^2cx(-4+6c^2x^2-4c^4x^4+c^6x^6)+6ab\sqrt{1-c^2}\right.\right.}{}$$

[In] Integrate[x*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]

[Out] -1/9216*(d^3*(c*x*(b^2*c*x*(837 - 489*c^2*x^2 + 200*c^4*x^4 - 36*c^6*x^6) + 1152*a^2*c*x*(-4 + 6*c^2*x^2 - 4*c^4*x^4 + c^6*x^6) + 6*a*b*Sqrt[1 - c^2*x^2]*(-279 + 326*c^2*x^2 - 200*c^4*x^4 + 48*c^6*x^6)) + 6*b*(b*c*x*Sqrt[1 - c^2*x^2]*(-279 + 326*c^2*x^2 - 200*c^4*x^4 + 48*c^6*x^6) + 3*a*(93 - 512*c^2*x^2 + 768*c^4*x^4 - 512*c^6*x^6 + 128*c^8*x^8))*ArcSin[c*x] + 9*b^2*(93 - 512*c^2*x^2 + 768*c^4*x^4 - 512*c^6*x^6 + 128*c^8*x^8)*ArcSin[c*x]^2))/c^2

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 336, normalized size of antiderivative = 1.25

method	result
derivativedivides	$\frac{-\frac{d^3a^2\left(c^2x^2-1\right)^4}{8}-d^3b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^4}{8}-\frac{\arcsin(cx)\left(-48c^7x^7\sqrt{-c^2x^2+1}+200c^5x^5\sqrt{-c^2x^2+1}-326c^3x^3\sqrt{-c^2x^2+1}+2\right.}{1536}\right.}{}$
default	$\frac{-\frac{d^3a^2\left(c^2x^2-1\right)^4}{8}-d^3b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^4}{8}-\frac{\arcsin(cx)\left(-48c^7x^7\sqrt{-c^2x^2+1}+200c^5x^5\sqrt{-c^2x^2+1}-326c^3x^3\sqrt{-c^2x^2+1}+2\right.}{1536}\right.}{}$
parts	$-\frac{d^3a^2\left(c^2x^2-1\right)^4}{8c^2}-\frac{d^3b^2\left(\frac{\arcsin(cx)^2\left(c^2x^2-1\right)^4}{8}-\frac{\arcsin(cx)\left(-48c^7x^7\sqrt{-c^2x^2+1}+200c^5x^5\sqrt{-c^2x^2+1}-326c^3x^3\sqrt{-c^2x^2+}\right.}{1536}\right.}{}$

[In] int(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)

[Out] 1/c^2*(-1/8*d^3*a^2*(c^2*x^2-1)^4-d^3*b^2*(1/8*arcsin(c*x)^2*(c^2*x^2-1)^4-1/1536*arcsin(c*x)*(-48*c^7*x^7*(-c^2*x^2+1)^(1/2)+200*c^5*x^5*(-c^2*x^2+1)^(1/2)-326*c^3*x^3*(-c^2*x^2+1)^(1/2)+279*c*x*(-c^2*x^2+1)^(1/2)+105*arcsin(c*x))+35/1024*arcsin(c*x)^2-1/256*(c^2*x^2-1)^4+7/1152*(c^2*x^2-1)^3-35/3072*(c^2*x^2-1)^2+35/1024*c^2*x^2-35/1024)-2*d^3*a*b*(1/8*arcsin(c*x)*c^8*x^8-1/2*arcsin(c*x)*c^6*x^6+3/4*c^4*x^4*arcsin(c*x)-1/2*c^2*x^2*arcsin(c*x)+93/1024*arcsin(c*x)+1/64*c^7*x^7*(-c^2*x^2+1)^(1/2)-25/384*c^5*x^5*(-c^2*x^2+1)^(1/2)+163/1536*c^3*x^3*(-c^2*x^2+1)^(1/2)-93/1024*c*x*(-c^2*x^2+1)^(1/2)))

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 354, normalized size of antiderivative = 1.32

$$\int x(d-c^2dx^2)^3(a+b\arcsin(cx))^2\,dx = -\frac{36\,(32\,a^2-b^2)c^8d^3x^8-8\,(576\,a^2-25\,b^2)c^6d^3x^6+3\,(2304\,a^2-163\,b^2)c^4d^3x^4-9\,(512\,a^2-93\,b^2)c^2d^3x^2+\cdots}{\cdots}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/9216*(36*(32*a^2 - b^2)*c^8*d^3*x^8 - 8*(576*a^2 - 25*b^2)*c^6*d^3*x^6 +
 3*(2304*a^2 - 163*b^2)*c^4*d^3*x^4 - 9*(512*a^2 - 93*b^2)*c^2*d^3*x^2 + 9*
(128*b^2*c^8*d^3*x^8 - 512*b^2*c^6*d^3*x^6 + 768*b^2*c^4*d^3*x^4 - 512*b^2*
c^2*d^3*x^2 + 93*b^2*d^3)*arcsin(c*x)^2 + 18*(128*a*b*c^8*d^3*x^8 - 512*a*b
*c^6*d^3*x^6 + 768*a*b*c^4*d^3*x^4 - 512*a*b*c^2*d^3*x^2 + 93*a*b*d^3)*arcs
in(c*x) + 6*(48*a*b*c^7*d^3*x^7 - 200*a*b*c^5*d^3*x^5 + 326*a*b*c^3*d^3*x^3
 - 279*a*b*c*d^3*x + (48*b^2*c^7*d^3*x^7 - 200*b^2*c^5*d^3*x^5 + 326*b^2*c^
3*d^3*x^3 - 279*b^2*c*d^3*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 573 vs. 2(252) = 504.

Time = 1.25 (sec) , antiderivative size = 573, normalized size of antiderivative = 2.14

$$\int x(d-c^2dx^2)^3(a+b\arcsin(cx))^2\,dx = \begin{cases} -\frac{a^2c^6d^3x^8}{8}+\frac{a^2c^4d^3x^6}{2}-\frac{3a^2c^2d^3x^4}{4}+\frac{a^2d^3x^2}{2}-\frac{abc^6d^3x^8\operatorname{asin}(cx)}{4}-\frac{abc^5d^3x^7\sqrt{-c^2x^2+1}}{32}+abc^4d^3x^6\operatorname{asin}(cx)+\frac{25abc^3d^3\cdots}{\cdots} \\ \frac{a^2d^3x^2}{2} \end{cases}$$

```
[In] integrate(x*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**8/8 + a**2*c**4*d**3*x**6/2 - 3*a**2*c**2*d**
3*x**4/4 + a**2*d**3*x**2/2 - a*b*c**6*d**3*x**8*asin(c*x)/4 - a*b*c**5*d**
3*x**7*sqrt(-c**2*x**2 + 1)/32 + a*b*c**4*d**3*x**6*asin(c*x) + 25*a*b*c**3
*d**3*x**5*sqrt(-c**2*x**2 + 1)/192 - 3*a*b*c**2*d**3*x**4*asin(c*x)/2 - 16
3*a*b*c*d**3*x**3*sqrt(-c**2*x**2 + 1)/768 + a*b*d**3*x**2*asin(c*x) + 93*a
*b*d**3*x*sqrt(-c**2*x**2 + 1)/(512*c) - 93*a*b*d**3*asin(c*x)/(512*c**2) -
 b**2*c**6*d**3*x**8*asin(c*x)**2/8 + b**2*c**6*d**3*x**8/256 - b**2*c**5*d
**3*x**7*sqrt(-c**2*x**2 + 1)*asin(c*x)/32 + b**2*c**4*d**3*x**6*asin(c*x)*
*2/2 - 25*b**2*c**4*d**3*x**6/1152 + 25*b**2*c**3*d**3*x**5*sqrt(-c**2*x**2
 + 1)*asin(c*x)/192 - 3*b**2*c**2*d**3*x**4*asin(c*x)**2/4 + 163*b**2*c**2*
```

```
d**3*x**4/3072 - 163*b**2*c*d**3*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/768 +
b**2*d**3*x**2*asin(c*x)**2/2 - 93*b**2*d**3*x**2/1024 + 93*b**2*d**3*x*sqr
t(-c**2*x**2 + 1)*asin(c*x)/(512*c) - 93*b**2*d**3*asin(c*x)**2/(1024*c**2)
, Ne(c, 0)), (a**2*d**3*x**2/2, True))
```

Maxima [F]

$$\int x(d-c^2dx^2)^3(a+b\arcsin(cx))^2\,dx=\int -\left(c^2dx^2-d\right)^3(b\arcsin(cx)+a)^2x\,dx$$

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/8*a^2*c^6*d^3*x^8 + 1/2*a^2*c^4*d^3*x^6 - 1/1536*(384*x^8*arcsin(c*x) +
(48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c
^2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c*x)/c^9)*c
)*a*b*c^6*d^3 - 3/4*a^2*c^2*d^3*x^4 + 1/48*(48*x^6*arcsin(c*x) + (8*sqrt(-c
^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)
*x/c^6 - 15*arcsin(c*x)/c^7)*c)*a*b*c^4*d^3 - 3/16*(8*x^4*arcsin(c*x) + (2*
sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5
)*c)*a*b*c^2*d^3 + 1/2*a^2*d^3*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*
x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*d^3 - 1/8*(b^2*c^6*d^3*x^8 - 4*b^2*c
^4*d^3*x^6 + 6*b^2*c^2*d^3*x^4 - 4*b^2*d^3*x^2)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))^2 - integrate(1/4*(b^2*c^7*d^3*x^8 - 4*b^2*c^5*d^3*x^6 + 6*
b^2*c^3*d^3*x^4 - 4*b^2*c*d^3*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 492 vs. $2(237) = 474$.

Time = 0.34 (sec) , antiderivative size = 492, normalized size of antiderivative = 1.84

$$\int x(d-c^2dx^2)^3(a+b\arcsin(cx))^2\,dx = -\frac{1}{8}a^2c^6d^3x^8+\frac{1}{2}a^2c^4d^3x^6-\frac{3}{4}a^2c^2d^3x^4 - \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}b^2d^3x\arcsin(cx)}{32\,c} - \frac{(c^2x^2-1)^4b^2d^3\arcsin(cx)^2}{8\,c^2} - \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}abd^3x}{32\,c} + \frac{7\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}b^2d^3x\arcsin(cx)}{192\,c} - \frac{(c^2x^2-1)^4abd^3\arcsin(cx)}{4\,c^2} + \frac{7\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}abd^3x}{192\,c} + \frac{35\,(-c^2x^2+1)^{\frac{3}{2}}b^2d^3x\arcsin(cx)}{768\,c} + \frac{(c^2x^2-1)^4b^2d^3}{256\,c^2} + \frac{35\,(-c^2x^2+1)^{\frac{3}{2}}abd^3x}{768\,c} + \frac{35\,\sqrt{-c^2x^2+1}b^2d^3x\arcsin(cx)}{512\,c} - \frac{7\,(c^2x^2-1)^3b^2d^3}{1152\,c^2} + \frac{35\,\sqrt{-c^2x^2+1}abd^3x}{512\,c} + \frac{35\,(c^2x^2-1)^2b^2d^3}{3072\,c^2} + \frac{35\,b^2d^3\arcsin(cx)^2}{1024\,c^2} + \frac{(c^2x^2-1)a^2d^3}{2\,c^2} - \frac{35\,(c^2x^2-1)b^2d^3}{1024\,c^2} + \frac{35\,abd^3\arcsin(cx)}{512\,c^2} - \frac{7175\,b^2d^3}{294912\,c^2}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/8*a^2*c^6*d^3*x^8 + 1/2*a^2*c^4*d^3*x^6 - 3/4*a^2*c^2*d^3*x^4 - 1/32*(c^
2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*arcsin(c*x)/c - 1/8*(c^2*x^2 - 1)
^4*b^2*d^3*arcsin(c*x)^2/c^2 - 1/32*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*
d^3*x/c + 7/192*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*arcsin(c*x)/c
- 1/4*(c^2*x^2 - 1)^4*a*b*d^3*arcsin(c*x)/c^2 + 7/192*(c^2*x^2 - 1)^2*sqrt(
-c^2*x^2 + 1)*a*b*d^3*x/c + 35/768*(-c^2*x^2 + 1)^(3/2)*b^2*d^3*x*arcsin(c*
x)/c + 1/256*(c^2*x^2 - 1)^4*b^2*d^3/c^2 + 35/768*(-c^2*x^2 + 1)^(3/2)*a*b*
d^3*x/c + 35/512*sqrt(-c^2*x^2 + 1)*b^2*d^3*x*arcsin(c*x)/c - 7/1152*(c^2*x
^2 - 1)^3*b^2*d^3/c^2 + 35/512*sqrt(-c^2*x^2 + 1)*a*b*d^3*x/c + 35/3072*(c^
2*x^2 - 1)^2*b^2*d^3/c^2 + 35/1024*b^2*d^3*arcsin(c*x)^2/c^2 + 1/2*(c^2*x^2
```

```
 - 1)*a^2*d^3/c^2 - 35/1024*(c^2*x^2 - 1)*b^2*d^3/c^2 + 35/512*a*b*d^3*arcs
in(c*x)/c^2 - 7175/294912*b^2*d^3/c^2
```

Mupad [F(-1)]

Timed out.

$$\int x(d-c^2dx^2)^3(a+b\arcsin(cx))^2\,dx=\int x\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^3\,dx$$

```
[In] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3,x)
[Out] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3, x)
```

3.178 $\int (d-c^2dx^2)^3 (a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 24, antiderivative size = 298

$$\int (d-c^2dx^2)^3 (a+b\arcsin(cx))^2\,dx = -\frac{4322b^2d^3x}{3675}+\frac{1514b^2c^2d^3x^3}{11025}-\frac{234b^2c^4d^3x^5}{6125}$$
$$+\frac{2}{343}b^2c^6d^3x^7+\frac{32bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{35c}+\frac{16bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{105c}$$
$$+\frac{12bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{175c}+\frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c}$$
$$+\frac{16}{35}d^3x(a+b\arcsin(cx))^2+\frac{8}{35}d^3x(1-c^2x^2)(a+b\arcsin(cx))^2+\frac{6}{35}d^3x(1-c^2x^2)^2(a+b\arcsin(cx))^2+\frac{1}{7}d^3x$$

```
[Out] -4322/3675*b^2*d^3*x+1514/11025*b^2*c^2*d^3*x^3-234/6125*b^2*c^4*d^3*x^5+2/
343*b^2*c^6*d^3*x^7+16/105*b*d^3*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c+12/
175*b*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))/c+2/49*b*d^3*(-c^2*x^2+1)^(7
/2)*(a+b*arcsin(c*x))/c+16/35*d^3*x*(a+b*arcsin(c*x))^2+8/35*d^3*x*(-c^2*x^
2+1)*(a+b*arcsin(c*x))^2+6/35*d^3*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2+1/7*
d^3*x*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2+32/35*b*d^3*(a+b*arcsin(c*x))*(-c^
2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 298, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used

$= \{4743, 4715, 4767, 8, 200\}$

$$\int \left(d-c^2dx^2\right)^3 (a+b\arcsin(cx))^2\,dx$$

$$= \frac{1}{7}d^3x\left(1-c^2x^2\right)^3 (a+b\arcsin(cx))^2 + \frac{6}{35}d^3x\left(1-c^2x^2\right)^2 (a+b\arcsin(cx))^2 + \frac{8}{35}d^3x\left(1-c^2x^2\right) (a+b\arcsin(cx))^2 + \frac{2bd^3(1-c^2x^2)^{7/2} (a+b\arcsin(cx))}{49c} + \frac{12bd^3(1-c^2x^2)^{5/2} (a+b\arcsin(cx))}{175c} + \frac{16bd^3(1-c^2x^2)^{3/2} (a+b\arcsin(cx))}{105c} + \frac{32bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{35c} + \frac{16}{35}d^3x(a+b\arcsin(cx))^2 + \frac{2}{343}b^2c^6d^3x^7 - \frac{234b^2c^4d^3x^5}{6125} + \frac{1514b^2c^2d^3x^3}{11025} - \frac{4322b^2d^3x}{3675}$$

```
[In] Int[(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-4322*b^2*d^3*x)/3675 + (1514*b^2*c^2*d^3*x^3)/11025 - (234*b^2*c^4*d^3*x^
5)/6125 + (2*b^2*c^6*d^3*x^7)/343 + (32*b*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcS
in[c*x]))/(35*c) + (16*b*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(105*
c) + (12*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(175*c) + (2*b*d^3*
(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(49*c) + (16*d^3*x*(a + b*ArcSin[c
*x])^2)/35 + (8*d^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/35 + (6*d^3*x*(1
 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/35 + (d^3*x*(1 - c^2*x^2)^3*(a + b*Arc
Sin[c*x])^2)/7
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
```

```
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{7}d^3x\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2+\frac{1}{7}(6d)\int\left(d-c^2dx^2\right)^2(a+b\arcsin(cx))^2\,dx \\
&\quad -\frac{1}{7}\left(2bcd^3\right)\int x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx \\
&= \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c}+\frac{6}{35}d^3x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{7}d^3x\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{35}\left(24d^2\right)\int\left(d-c^2dx^2\right)(a+b\arcsin(cx))^2\,dx-\frac{1}{49}\left(2b^2d^3\right)\int\left(1-c^2x^2\right)^3\,dx \\
&\quad -\frac{1}{35}\left(12bcd^3\right)\int x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx \\
&= \frac{12bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{175c}+\frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c} \\
&\quad +\frac{8}{35}d^3x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{6}{35}d^3x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{7}d^3x\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2+\frac{1}{35}\left(16d^3\right)\int(a+b\arcsin(cx))^2\,dx \\
&\quad -\frac{1}{49}\left(2b^2d^3\right)\int\left(1-3c^2x^2+3c^4x^4-c^6x^6\right)\,dx-\frac{1}{175}\left(12b^2d^3\right)\int\left(1-c^2x^2\right)^2\,dx \\
&\quad -\frac{1}{35}\left(16bcd^3\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx \\
&= -\frac{2}{49}b^2d^3x+\frac{2}{49}b^2c^2d^3x^3-\frac{6}{245}b^2c^4d^3x^5 \\
&\quad +\frac{2}{343}b^2c^6d^3x^7+\frac{16bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{105c} \\
&\quad +\frac{12bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{175c}+\frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c} \\
&\quad +\frac{16}{35}d^3x(a+b\arcsin(cx))^2+\frac{8}{35}d^3x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{6}{35}d^3x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))
\end{aligned}$$

$$= -\frac{962b^2d^3x}{3675} + \frac{1514b^2c^2d^3x^3}{11025} - \frac{234b^2c^4d^3x^5}{6125} + \frac{2}{343}b^2c^6d^3x^7 + \frac{32bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{35c} + \frac{16bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{105c} + \frac{12bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{175c} + \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c} + \frac{16}{35}d^3x(a+b\arcsin(cx))^2 + \frac{8}{35}d^3x(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{6}{35}d^3x(1-c^2x^2)^2(a+b\arcsin(cx$$

$$= -\frac{4322b^2d^3x}{3675} + \frac{1514b^2c^2d^3x^3}{11025} - \frac{234b^2c^4d^3x^5}{6125} + \frac{2}{343}b^2c^6d^3x^7 + \frac{32bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{35c} + \frac{16bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{105c} + \frac{12bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{175c} + \frac{2bd^3(1-c^2x^2)^{7/2}(a+b\arcsin(cx))}{49c} + \frac{16}{35}d^3x(a+b\arcsin(cx))^2 + \frac{8}{35}d^3x(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{6}{35}d^3x(1-c^2x^2)^2(a+b\arcsin(cx$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 241, normalized size of antiderivative = 0.81

$$\int (d-c^2dx^2)^3 (a+b\arcsin(cx))^2 dx = -\frac{d^3(2b^2cx(226905-26495c^2x^2+7371c^4x^4-1125c^6x^6)+11025a^2cx(-35+35c^2x^2-21c^4x^4+5c^6x^6)}{}$$

```
[In] Integrate[(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/385875*(d^3*(2*b^2*c*x*(226905 - 26495*c^2*x^2 + 7371*c^4*x^4 - 1125*c^6
*x^6) + 11025*a^2*c*x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) + 210*a*b
*Sqrt[1 - c^2*x^2]*(-2161 + 757*c^2*x^2 - 351*c^4*x^4 + 75*c^6*x^6) + 210*b
*(105*a*c*x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) + b*Sqrt[1 - c^2*x^
2]*(-2161 + 757*c^2*x^2 - 351*c^4*x^4 + 75*c^6*x^6))*ArcSin[c*x] + 11025*b^
2*c*x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6)*ArcSin[c*x]^2))/c
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 384, normalized size of antiderivative = 1.29

method	result
derivativedivides	$\frac{-d^3a^2\left(\frac{1}{7}c^7x^7-\frac{3}{5}c^5x^5+c^3x^3-cx\right)-d^3b^2\left(\frac{\arcsin(cx)^2\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)cx}{35}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}}{49}-\frac{2(5}{}\right.}{}$
default	$\frac{-d^3a^2\left(\frac{1}{7}c^7x^7-\frac{3}{5}c^5x^5+c^3x^3-cx\right)-d^3b^2\left(\frac{\arcsin(cx)^2\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)cx}{35}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}}{49}-\frac{2(5}{}\right.}{}$
parts	$-d^3a^2\left(\frac{1}{7}c^6x^7-\frac{3}{5}c^4x^5+c^2x^3-x\right)-\frac{d^3b^2\left(\frac{\arcsin(cx)^2\left(5c^6x^6-21c^4x^4+35c^2x^2-35\right)cx}{35}+\frac{2\arcsin(cx)\left(c^2x^2-1\right)^3}{49}\right.}{}$

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-d^3*a^2*(1/7*c^7*x^7-3/5*c^5*x^5+c^3*x^3-c*x)-d^3*b^2*(1/35*arcsin(c*
x)^2*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x+2/49*arcsin(c*x)*(c^2*x^2-1)^
3*(-c^2*x^2+1)^(1/2)-2/1715*(5*c^6*x^6-21*c^4*x^4+35*c^2*x^2-35)*c*x-12/175
*arcsin(c*x)*(c^2*x^2-1)^2*(-c^2*x^2+1)^(1/2)+4/875*(3*c^4*x^4-10*c^2*x^2+1
5)*c*x+16/105*arcsin(c*x)*(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-16/315*(c^2*x^2-3)
*c*x+32/35*c*x-32/35*arcsin(c*x)*(-c^2*x^2+1)^(1/2))-2*d^3*a*b*(1/7*arcsin(
c*x)*c^7*x^7-3/5*arcsin(c*x)*c^5*x^5+c^3*x^3*arcsin(c*x)-c*x*arcsin(c*x)-21
61/3675*(-c^2*x^2+1)^(1/2)+1/49*c^6*x^6*(-c^2*x^2+1)^(1/2)-117/1225*c^4*x^4
*(-c^2*x^2+1)^(1/2)+757/3675*c^2*x^2*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 323, normalized size of antiderivative = 1.08

$$\int \left(d-c^2dx^2\right)^3 (a+b\arcsin(cx))^2\,dx =$$
$$-\frac{1125\,(49\,a^2-2\,b^2)c^7d^3x^7-189\,(1225\,a^2-78\,b^2)c^5d^3x^5+35\,(11025\,a^2-1514\,b^2)c^3d^3x^3-105\,(3675\,a^2-}{}$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/385875*(1125*(49*a^2 - 2*b^2)*c^7*d^3*x^7 - 189*(1225*a^2 - 78*b^2)*c^5*
d^3*x^5 + 35*(11025*a^2 - 1514*b^2)*c^3*d^3*x^3 - 105*(3675*a^2 - 4322*b^2)
*c*d^3*x + 11025*(5*b^2*c^7*d^3*x^7 - 21*b^2*c^5*d^3*x^5 + 35*b^2*c^3*d^3*x
^3 - 35*b^2*c*d^3*x)*arcsin(c*x)^2 + 22050*(5*a*b*c^7*d^3*x^7 - 21*a*b*c^5*
d^3*x^5 + 35*a*b*c^3*d^3*x^3 - 35*a*b*c*d^3*x)*arcsin(c*x) + 210*(75*a*b*c^
6*d^3*x^6 - 351*a*b*c^4*d^3*x^4 + 757*a*b*c^2*d^3*x^2 - 2161*a*b*d^3 + (75*
b^2*c^6*d^3*x^6 - 351*b^2*c^4*d^3*x^4 + 757*b^2*c^2*d^3*x^2 - 2161*b^2*d^3)
*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c
```

Sympy [A] (verification not implemented)

Time = 0.83 (sec) , antiderivative size = 524, normalized size of antiderivative = 1.76

$$\int \left(d-c^2dx^2\right)^3(a+b\arcsin(cx))^2\,dx$$
$$=\begin{cases}-\frac{a^2c^6d^3x^7}{7}+\frac{3a^2c^4d^3x^5}{5}-a^2c^2d^3x^3+a^2d^3x-\frac{2abc^6d^3x^7\operatorname{asin}(cx)}{7}-\frac{2abc^5d^3x^6\sqrt{-c^2x^2+1}}{49}+\frac{6abc^4d^3x^5\operatorname{asin}(cx)}{5}+\frac{234abc}{} \\ a^2d^3x\end{cases}$$

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((-a**2*c**6*d**3*x**7/7 + 3*a**2*c**4*d**3*x**5/5 - a**2*c**2*d**
3*x**3 + a**2*d**3*x - 2*a*b*c**6*d**3*x**7*asin(c*x)/7 - 2*a*b*c**5*d**3*x
**6*sqrt(-c**2*x**2 + 1)/49 + 6*a*b*c**4*d**3*x**5*asin(c*x)/5 + 234*a*b*c*
*3*d**3*x**4*sqrt(-c**2*x**2 + 1)/1225 - 2*a*b*c**2*d**3*x**3*asin(c*x) - 1
514*a*b*c*d**3*x**2*sqrt(-c**2*x**2 + 1)/3675 + 2*a*b*d**3*x*asin(c*x) + 43
22*a*b*d**3*sqrt(-c**2*x**2 + 1)/(3675*c) - b**2*c**6*d**3*x**7*asin(c*x)**
2/7 + 2*b**2*c**6*d**3*x**7/343 - 2*b**2*c**5*d**3*x**6*sqrt(-c**2*x**2 + 1
)*asin(c*x)/49 + 3*b**2*c**4*d**3*x**5*asin(c*x)**2/5 - 234*b**2*c**4*d**3*
x**5/6125 + 234*b**2*c**3*d**3*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/1225 - b
**2*c**2*d**3*x**3*asin(c*x)**2 + 1514*b**2*c**2*d**3*x**3/11025 - 1514*b**
2*c*d**3*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/3675 + b**2*d**3*x*asin(c*x)**
2 - 4322*b**2*d**3*x/3675 + 4322*b**2*d**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(
3675*c), Ne(c, 0)), (a**2*d**3*x, True))
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 729 vs. $2(263) = 526$.

Time = 0.30 (sec) , antiderivative size = 729, normalized size of antiderivative = 2.45

$$\int \left(d-c^2dx^2\right)^3 (a+b\arcsin(cx))^2\,dx$$
$$= -\frac{1}{7}b^2c^6d^3x^7\arcsin(cx)^2 - \frac{1}{7}a^2c^6d^3x^7 + \frac{3}{5}b^2c^4d^3x^5\arcsin(cx)^2 + \frac{3}{5}a^2c^4d^3x^5$$
$$-\frac{2}{245}\left(35\,x^7\arcsin(cx) + \left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2} + \frac{6\sqrt{-c^2x^2+1}x^4}{c^4} + \frac{8\sqrt{-c^2x^2+1}x^2}{c^6} + \frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c$$
$$-\frac{2}{25725}\left(105\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2} + \frac{6\sqrt{-c^2x^2+1}x^4}{c^4} + \frac{8\sqrt{-c^2x^2+1}x^2}{c^6} + \frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\arcsin(cx) -$$
$$-b^2c^2d^3x^3\arcsin(cx)^2$$
$$+\frac{2}{25}\left(15\,x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abc^4d^3$$
$$+\frac{2}{375}\left(15\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\arcsin(cx) - \frac{9\,c^4x^5 + 20\,c^2x^3 + 120}{c^4}\right.$$
$$-a^2c^2d^3x^3 - \frac{2}{3}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abc^2d^3$$
$$-\frac{2}{9}\left(3\,c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\arcsin(cx) - \frac{c^2x^3+6\,x}{c^2}\right)b^2c^2d^3$$
$$+b^2d^3x\arcsin(cx)^2 - 2\,b^2d^3\left(x - \frac{\sqrt{-c^2x^2+1}\arcsin(cx)}{c}\right)$$
$$+a^2d^3x + \frac{2\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)abd^3}{c}$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/7*b^2*c^6*d^3*x^7*arcsin(c*x)^2 - 1/7*a^2*c^6*d^3*x^7 + 3/5*b^2*c^4*d^3*
x^5*arcsin(c*x)^2 + 3/5*a^2*c^4*d^3*x^5 - 2/245*(35*x^7*arcsin(c*x) + (5*sq
rt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 +
 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*a*b*c^6*d^3 - 2/25725*(105*(5*s
qrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2
+ 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c*arcsin(c*x) - (75*c^6*x^7 + 126
*c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2*c^6*d^3 - b^2*c^2*d^3*x^3*arcsin(
c*x)^2 + 2/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(
-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^4*d^3 + 2/375*(1
5*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^
2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*c
^4*d^3 - a^2*c^2*d^3*x^3 - 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x
^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^2*d^3 - 2/9*(3*c*(sqrt(-c^2*x^2 +
 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*
```

```
b^2*c^2*d^3 + b^2*d^3*x*arcsin(c*x)^2 - 2*b^2*d^3*(x - sqrt(-c^2*x^2 + 1)*a
rcsin(c*x)/c) + a^2*d^3*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d^
3/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 528 vs. $2(263) = 526$.

Time = 0.32 (sec) , antiderivative size = 528, normalized size of antiderivative = 1.77

$$\int \left(d-c^2dx^2\right)^3(a+b\arcsin(cx))^2\,dx = -\frac{1}{7}a^2c^6d^3x^7+\frac{3}{5}a^2c^4d^3x^5 - \frac{1}{7}\left(c^2x^2-1\right)^3b^2d^3x\arcsin(cx)^2 - a^2c^2d^3x^3-\frac{2}{7}\left(c^2x^2-1\right)^3abd^3x\arcsin(cx) + \frac{6}{35}\left(c^2x^2-1\right)^2b^2d^3x\arcsin(cx)^2 + \frac{2}{343}\left(c^2x^2-1\right)^3b^2d^3x + \frac{12}{35}\left(c^2x^2-1\right)^2abd^3x\arcsin(cx) - \frac{8}{35}\left(c^2x^2-1\right)b^2d^3x\arcsin(cx)^2 - \frac{2\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}b^2d^3\arcsin(cx)}{49\,c} - \frac{888}{42875}\left(c^2x^2-1\right)^2b^2d^3x - \frac{16}{35}\left(c^2x^2-1\right)abd^3x\arcsin(cx) + \frac{16}{35}b^2d^3x\arcsin(cx)^2 - \frac{2\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}abd^3}{49\,c} + \frac{12\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}b^2d^3\arcsin(cx)}{175\,c} + \frac{30256}{385875}\left(c^2x^2-1\right)b^2d^3x+\frac{32}{35}abd^3x\arcsin(cx) + \frac{12\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}abd^3}{175\,c} + \frac{16\left(-c^2x^2+1\right)^{\frac{3}{2}}b^2d^3\arcsin(cx)}{105\,c}+a^2d^3x - \frac{413312}{385875}b^2d^3x+\frac{16\left(-c^2x^2+1\right)^{\frac{3}{2}}abd^3}{105\,c} + \frac{32\sqrt{-c^2x^2+1}b^2d^3\arcsin(cx)}{35\,c} + \frac{32\sqrt{-c^2x^2+1}abd^3}{35\,c}$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -1/7*a^2*c^6*d^3*x^7 + 3/5*a^2*c^4*d^3*x^5 - 1/7*(c^2*x^2 - 1)^3*b^2*d^3*x*
arcsin(c*x)^2 - a^2*c^2*d^3*x^3 - 2/7*(c^2*x^2 - 1)^3*a*b*d^3*x*arcsin(c*x)
```

```
 + 6/35*(c^2*x^2 - 1)^2*b^2*d^3*x*arcsin(c*x)^2 + 2/343*(c^2*x^2 - 1)^3*b^2
*d^3*x + 12/35*(c^2*x^2 - 1)^2*a*b*d^3*x*arcsin(c*x) - 8/35*(c^2*x^2 - 1)*b
^2*d^3*x*arcsin(c*x)^2 - 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*d^3*ar
csin(c*x)/c - 888/42875*(c^2*x^2 - 1)^2*b^2*d^3*x - 16/35*(c^2*x^2 - 1)*a*b
*d^3*x*arcsin(c*x) + 16/35*b^2*d^3*x*arcsin(c*x)^2 - 2/49*(c^2*x^2 - 1)^3*s
qrt(-c^2*x^2 + 1)*a*b*d^3/c + 12/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2
*d^3*arcsin(c*x)/c + 30256/385875*(c^2*x^2 - 1)*b^2*d^3*x + 32/35*a*b*d^3*x
*arcsin(c*x) + 12/175*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d^3/c + 16/105
*(-c^2*x^2 + 1)^(3/2)*b^2*d^3*arcsin(c*x)/c + a^2*d^3*x - 413312/385875*b^2
*d^3*x + 16/105*(-c^2*x^2 + 1)^(3/2)*a*b*d^3/c + 32/35*sqrt(-c^2*x^2 + 1)*b
^2*d^3*arcsin(c*x)/c + 32/35*sqrt(-c^2*x^2 + 1)*a*b*d^3/c
```

Mupad [F(-1)]

Timed out.

$$\int \left(d-c^2dx^2\right)^3\left(a+b\arcsin(cx)\right)^2\,dx=\int \left(a+b\,\mathrm{asin}(c\,x)\right)^2\left(d-c^2\,d\,x^2\right)^3\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3,x)
[Out] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3, x)
```

3.179 $\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))^2}{x}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 354

$$\begin{aligned}\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))^2}{x}\,dx &= \frac{71}{144}b^2c^2d^3x^2-\frac{7}{144}b^2c^4d^3x^4-\frac{1}{108}b^2d^3(1-c^2x^2)^3\\ &-\frac{19}{24}bcd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\\ &-\frac{7}{36}bcd^3x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\\ &-\frac{1}{18}bcd^3x(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\\ &-\frac{19}{48}d^3(a+b\arcsin(cx))^2\\ &+\frac{1}{2}d^3(1-c^2x^2)(a+b\arcsin(cx))^2\\ &+\frac{1}{4}d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2\\ &+\frac{1}{6}d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2\\ &-\frac{id^3(a+b\arcsin(cx))^3}{3b}\\ &+d^3(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right)\\ &-ibd^3(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\\ &+\frac{1}{2}b^2d^3\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)\end{aligned}$$

```
[Out] 71/144*b^2*c^2*d^3*x^2-7/144*b^2*c^4*d^3*x^4-1/108*b^2*d^3*(-c^2*x^2+1)^3-7
/36*b*c*d^3*x*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))-1/18*b*c*d^3*x*(-c^2*x^2
+1)^(5/2)*(a+b*arcsin(c*x))-19/48*d^3*(a+b*arcsin(c*x))^2+1/2*d^3*(-c^2*x^2
+1)*(a+b*arcsin(c*x))^2+1/4*d^3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2+1/6*d^3*
```

```
(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2-1/3*I*d^3*(a+b*arcsin(c*x))^3/b+d^3*(a+b
*arcsin(c*x))^2*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-I*b*d^3*(a+b*arcsin(c*x)
)*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*b^2*d^3*polylog(3,(I*c*x+(-c^
2*x^2+1)^(1/2))^2)-19/24*b*c*d^3*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 354, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.481$, Rules used = {4787, 4721, 3798, 2221, 2611, 2320, 6724, 4741, 4737, 30, 4743, 14, 267}

$$\begin{aligned}\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x}\,dx = &-\frac{1}{18}bcd^3x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx)) \\ &-\frac{7}{36}bcd^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) \\ &-\frac{19}{24}bcd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\ &+\frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2 \\ &+\frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 \\ &+\frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\ &-ibd^3\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx)) \\ &-\frac{id^3(a+b\arcsin(cx))^3}{3b}-\frac{19}{48}d^3(a+b\arcsin(cx))^2 \\ &+d^3\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))^2 \\ &+\frac{1}{2}b^2d^3\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)-\frac{7}{144}b^2c^4d^3x^4 \\ &+\frac{71}{144}b^2c^2d^3x^2-\frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3\end{aligned}$$

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (71*b^2*c^2*d^3*x^2)/144 - (7*b^2*c^4*d^3*x^4)/144 - (b^2*d^3*(1 - c^2*x^2)
^3)/108 - (19*b*c*d^3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/24 - (7*b*c*
d^3*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/36 - (b*c*d^3*x*(1 - c^2*x^2
)^(5/2)*(a + b*ArcSin[c*x]))/18 - (19*d^3*(a + b*ArcSin[c*x])^2)/48 + (d^3*
(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/2 + (d^3*(1 - c^2*x^2)^2*(a + b*ArcSin
[c*x])^2)/4 + (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/6 - ((I/3)*d^3*(a
 + b*ArcSin[c*x])^3)/b + d^3*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*ArcSin[
c*x])] - I*b*d^3*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])] + (b
^2*d^3*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{6}d^3\left(1-c^2x^2\right)^3\left(a+b\arcsin(cx)\right)^2+d\int\frac{\left(d-c^2dx^2\right)^2\left(a+b\arcsin(cx)\right)^2}{x}\,dx \\
&\quad -\frac{1}{3}\left(bcd^3\right)\int\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)dx \\
&= -\frac{1}{18}bcd^3x\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)+\frac{1}{4}d^3\left(1-c^2x^2\right)^2\left(a+b\arcsin(cx)\right)^2 \\
&\quad +\frac{1}{6}d^3\left(1-c^2x^2\right)^3\left(a+b\arcsin(cx)\right)^2+d^2\int\frac{\left(d-c^2dx^2\right)\left(a+b\arcsin(cx)\right)^2}{x}\,dx \\
&\quad -\frac{1}{18}\left(5bcd^3\right)\int\left(1-c^2x^2\right)^{3/2}\left(a+b\arcsin(cx)\right)dx \\
&\quad -\frac{1}{2}\left(bcd^3\right)\int\left(1-c^2x^2\right)^{3/2}\left(a+b\arcsin(cx)\right)dx+\frac{1}{18}\left(b^2c^2d^3\right)\int x\left(1-c^2x^2\right)^2\,dx \\
&= -\frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3-\frac{7}{36}bcd^3x\left(1-c^2x^2\right)^{3/2}\left(a+b\arcsin(cx)\right) \\
&\quad -\frac{1}{18}bcd^3x\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)+\frac{1}{2}d^3\left(1-c^2x^2\right)\left(a+b\arcsin(cx)\right)^2 \\
&\quad +\frac{1}{4}d^3\left(1-c^2x^2\right)^2\left(a+b\arcsin(cx)\right)^2+\frac{1}{6}d^3\left(1-c^2x^2\right)^3\left(a+b\arcsin(cx)\right)^2 \\
&\quad +d^3\int\frac{\left(a+b\arcsin(cx)\right)^2}{x}\,dx-\frac{1}{24}\left(5bcd^3\right)\int\sqrt{1-c^2x^2}\left(a+b\arcsin(cx)\right)dx \\
&\quad -\frac{1}{8}\left(3bcd^3\right)\int\sqrt{1-c^2x^2}\left(a+b\arcsin(cx)\right)dx \\
&\quad -\left(bcd^3\right)\int\sqrt{1-c^2x^2}\left(a+b\arcsin(cx)\right)dx+\frac{1}{72}\left(5b^2c^2d^3\right)\int x\left(1-c^2x^2\right)\,dx \\
&\quad +\frac{1}{8}\left(b^2c^2d^3\right)\int x\left(1-c^2x^2\right)\,dx
\end{aligned}
$$

$$= -\frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3 - \frac{19}{24}bcd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))$$
$$-\frac{7}{36}bcd^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))$$
$$-\frac{1}{18}bcd^3x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx)) + \frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2$$
$$+\frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 + \frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2$$
$$+d^3\text{Subst}\left(\int(a+bx)^2\cot(x)\,dx, x, \arcsin(cx)\right)$$
$$-\frac{1}{48}\left(5bcd^3\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx - \frac{1}{16}\left(3bcd^3\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx$$
$$-\frac{1}{2}\left(bcd^3\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx + \frac{1}{72}\left(5b^2c^2d^3\right)\int\left(x-c^2x^3\right)\,dx$$
$$+\frac{1}{48}\left(5b^2c^2d^3\right)\int x\,dx + \frac{1}{8}\left(b^2c^2d^3\right)\int\left(x-c^2x^3\right)\,dx + \frac{1}{16}\left(3b^2c^2d^3\right)\int x\,dx$$
$$+\frac{1}{2}\left(b^2c^2d^3\right)\int x\,dx$$

$$= \frac{71}{144}b^2c^2d^3x^2 - \frac{7}{144}b^2c^4d^3x^4 - \frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3$$
$$-\frac{19}{24}bcd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))$$
$$-\frac{7}{36}bcd^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{1}{18}bcd^3x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))$$
$$-\frac{19}{48}d^3(a+b\arcsin(cx))^2 + \frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2$$
$$+\frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 + \frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2$$
$$-\frac{id^3(a+b\arcsin(cx))^3}{3b} - \left(2id^3\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)^2}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)$$

$$= \frac{71}{144}b^2c^2d^3x^2 - \frac{7}{144}b^2c^4d^3x^4 - \frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3$$
$$-\frac{19}{24}bcd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))$$
$$-\frac{7}{36}bcd^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{1}{18}bcd^3x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))$$
$$-\frac{19}{48}d^3(a+b\arcsin(cx))^2 + \frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2$$
$$+\frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 + \frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2$$
$$-\frac{id^3(a+b\arcsin(cx))^3}{3b} + d^3(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right)$$
$$-\left(2bd^3\right)\text{Subst}\left(\int(a+bx)\log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)$$

$$= \frac{71}{144}b^2c^2d^3x^2 - \frac{7}{144}b^2c^4d^3x^4 - \frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3 - \frac{19}{24}bcd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{7}{36}bcd^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{1}{18}bcd^3x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx)) - \frac{19}{48}d^3(a+b\arcsin(cx))^2 + \frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 + \frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2 - \frac{id^3(a+b\arcsin(cx))^3}{3b} + d^3(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) - ibd^3(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) + \left(ib^2d^3\right)\operatorname{Subst}\left(\int \operatorname{PolyLog}\left(2,e^{2ix}\right)dx, x, \arcsin(cx)\right)$$

$$= \frac{71}{144}b^2c^2d^3x^2 - \frac{7}{144}b^2c^4d^3x^4 - \frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3 - \frac{19}{24}bcd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{7}{36}bcd^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{1}{18}bcd^3x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx)) - \frac{19}{48}d^3(a+b\arcsin(cx))^2 + \frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 + \frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2 - \frac{id^3(a+b\arcsin(cx))^3}{3b} + d^3(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) - ibd^3(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) + \frac{1}{2}\left(b^2d^3\right)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,x)}{x}dx, x, e^{2i\arcsin(cx)}\right)$$

$$= \frac{71}{144}b^2c^2d^3x^2 - \frac{7}{144}b^2c^4d^3x^4 - \frac{1}{108}b^2d^3\left(1-c^2x^2\right)^3 - \frac{19}{24}bcd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{7}{36}bcd^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{1}{18}bcd^3x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx)) - \frac{19}{48}d^3(a+b\arcsin(cx))^2 + \frac{1}{2}d^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{1}{4}d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 + \frac{1}{6}d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2 - \frac{id^3(a+b\arcsin(cx))^3}{3b} + d^3(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) - ibd^3(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) + \frac{1}{2}b^2d^3\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.93 (sec) , antiderivative size = 466, normalized size of antiderivative = 1.32

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x}\,dx$$
$$= \frac{d^3\Big(-144ib^2\pi^3 - 5184a^2c^2x^2 + 2592a^2c^4x^4 - 576a^2c^6x^6 - 3600abcx\sqrt{1-c^2x^2} + 1056abc^3x^3\sqrt{1-c^2x^2} -}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (d^3*((-144*I)*b^2*Pi^3 - 5184*a^2*c^2*x^2 + 2592*a^2*c^4*x^4 - 576*a^2*c^6
*x^6 - 3600*a*b*c*x*Sqrt[1 - c^2*x^2] + 1056*a*b*c^3*x^3*Sqrt[1 - c^2*x^2]
- 192*a*b*c^5*x^5*Sqrt[1 - c^2*x^2] - 10368*a*b*c^2*x^2*ArcSin[c*x] + 5184*
a*b*c^4*x^4*ArcSin[c*x] - 1152*a*b*c^6*x^6*ArcSin[c*x] - (3456*I)*a*b*ArcSi
n[c*x]^2 + (1152*I)*b^2*ArcSin[c*x]^3 + 7200*a*b*ArcTan[(c*x)/(-1 + Sqrt[1
- c^2*x^2])] - 783*b^2*Cos[2*ArcSin[c*x]] + 1566*b^2*ArcSin[c*x]^2*Cos[2*Ar
cSin[c*x]] - 27*b^2*Cos[4*ArcSin[c*x]] + 216*b^2*ArcSin[c*x]^2*Cos[4*ArcSin
[c*x]] - b^2*Cos[6*ArcSin[c*x]] + 18*b^2*ArcSin[c*x]^2*Cos[6*ArcSin[c*x]] +
 3456*b^2*ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] + 6912*a*b*ArcSin[c
*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 3456*a^2*Log[c*x] + (3456*I)*b^2*ArcSi
n[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] - (3456*I)*a*b*PolyLog[2, E^((2*I
)*ArcSin[c*x])] + 1728*b^2*PolyLog[3, E^((-2*I)*ArcSin[c*x])] - 1566*b^2*Ar
cSin[c*x]*Sin[2*ArcSin[c*x]] - 108*b^2*ArcSin[c*x]*Sin[4*ArcSin[c*x]] - 6*b
^2*ArcSin[c*x]*Sin[6*ArcSin[c*x]]))/3456
```

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 498, normalized size of antiderivative = 1.41

method	result
parts	$-d^3a^2\left(\frac{c^6x^6}{6}-\frac{3c^4x^4}{4}+\frac{3c^2x^2}{2}-\ln(x)\right)-d^3b^2\Big(\frac{i\arcsin(cx)^3}{3}-\arcsin(cx)^2\ln\left(1+icx+\sqrt{-}\right.$
derivativedivides	$-d^3a^2\left(\frac{c^6x^6}{6}-\frac{3c^4x^4}{4}+\frac{3c^2x^2}{2}-\ln(cx)\right)-d^3b^2\Big(\frac{i\arcsin(cx)^3}{3}-\arcsin(cx)^2\ln\left(1+icx+\sqrt{}\right.$
default	$-d^3a^2\left(\frac{c^6x^6}{6}-\frac{3c^4x^4}{4}+\frac{3c^2x^2}{2}-\ln(cx)\right)-d^3b^2\Big(\frac{i\arcsin(cx)^3}{3}-\arcsin(cx)^2\ln\left(1+icx+\sqrt{}\right.$

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x,x,method=_RETURNVERBOSE)
```

```
[Out] -d^3*a^2*(1/6*c^6*x^6-3/4*c^4*x^4+3/2*c^2*x^2-ln(x))-d^3*b^2*(1/3*I*arcsin(
c*x)^3-arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*polylog
(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-arcsin
```

```
(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*polylog(2,I*c*x+(-c^
2*x^2+1)^(1/2))-2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-1/3456*(18*arcsin(c*x
)^2-1)*cos(6*arcsin(c*x))+1/576*arcsin(c*x)*sin(6*arcsin(c*x))-1/128*(8*arc
sin(c*x)^2-1)*cos(4*arcsin(c*x))+1/32*arcsin(c*x)*sin(4*arcsin(c*x))-29/128
*(2*arcsin(c*x)^2-1)*cos(2*arcsin(c*x))+29/64*arcsin(c*x)*sin(2*arcsin(c*x)
))-2*d^3*a*b*(1/2*I*arcsin(c*x)^2-arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2)
)+I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1
)^(1/2))+I*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/192*arcsin(c*x)*cos(6*arcs
in(c*x))+1/1152*sin(6*arcsin(c*x))-1/16*arcsin(c*x)*cos(4*arcsin(c*x))+1/64
*sin(4*arcsin(c*x))-29/64*arcsin(c*x)*cos(2*arcsin(c*x))+29/128*sin(2*arcsi
n(c*x)))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^3\,(a+b\arcsin(cx))^2}{x}\,dx = \int -\frac{(c^2dx^2-d)^3(b\arcsin(cx)+a)^2}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^
3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arc
sin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a
*b*d^3)*arcsin(c*x))/x, x)
```

Sympy [F]

$$\begin{aligned}\int \frac{(d-c^2dx^2)^3\,(a+b\arcsin(cx))^2}{x}\,dx = -d^3\Bigg(&\int\left(-\frac{a^2}{x}\right)dx+\int 3a^2c^2x\,dx \\ &+\int\left(-3a^2c^4x^3\right)dx+\int a^2c^6x^5\,dx \\ &+\int\left(-\frac{b^2\operatorname{asin}^2(cx)}{x}\right)dx \\ &+\int\left(-\frac{2ab\operatorname{asin}(cx)}{x}\right)dx+\int 3b^2c^2x\operatorname{asin}^2(cx)\,dx \\ &+\int\left(-3b^2c^4x^3\operatorname{asin}^2(cx)\right)dx \\ &+\int b^2c^6x^5\operatorname{asin}^2(cx)\,dx+\int 6abc^2x\operatorname{asin}(cx)\,dx \\ &+\int\left(-6abc^4x^3\operatorname{asin}(cx)\right)dx \\ &+\int 2abc^6x^5\operatorname{asin}(cx)\,dx\Bigg)\end{aligned}$$

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2/x,x)
```

```
[Out] -d**3*(Integral(-a**2/x, x) + Integral(3*a**2*c**2*x, x) + Integral(-3*a**2
*c**4*x**3, x) + Integral(a**2*c**6*x**5, x) + Integral(-b**2*asin(c*x)**2/
x, x) + Integral(-2*a*b*asin(c*x)/x, x) + Integral(3*b**2*c**2*x*asin(c*x)*
*2, x) + Integral(-3*b**2*c**4*x**3*asin(c*x)**2, x) + Integral(b**2*c**6*x
**5*asin(c*x)**2, x) + Integral(6*a*b*c**2*x*asin(c*x), x) + Integral(-6*a*
b*c**4*x**3*asin(c*x), x) + Integral(2*a*b*c**6*x**5*asin(c*x), x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x}\,dx = \int -\frac{(c^2dx^2-d)^3(b\arcsin(cx)+a)^2}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] -1/6*a^2*c^6*d^3*x^6 + 3/4*a^2*c^4*d^3*x^4 - 3/2*a^2*c^2*d^3*x^2 + a^2*d^3*
log(x) - integrate(((b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^
2 - b^2*d^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^6*d^3*
x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a*b*d^3)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)))/x, x)
```

Giac [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x}\,dx = \int -\frac{(c^2dx^2-d)^3(b\arcsin(cx)+a)^2}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)^2/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^3}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x, x)
```

3.180 $\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))^2}{x^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 329

$$\begin{aligned}
\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))^2}{x^2}\,dx &= \frac{122}{25}b^2c^2d^3x-\frac{14}{75}b^2c^4d^3x^3+\frac{2}{125}b^2c^6d^3x^5\\
&\quad-\frac{22}{5}bcd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\\
&\quad-\frac{2}{5}bcd^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\\
&\quad-\frac{2}{25}bcd^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\\
&\quad-\frac{16}{5}c^2d^3x(a+b\arcsin(cx))^2\\
&\quad-\frac{8}{5}c^2d^3x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2\\
&\quad-\frac{6}{5}c^2d^3x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2\\
&\quad-\frac{d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2}{x}\\
&\quad-4bcd^3(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)\\
&\quad+2ib^2cd^3\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)\\
&\quad-2ib^2cd^3\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)
\end{aligned}$$

```
[Out] 122/25*b^2*c^2*d^3*x-14/75*b^2*c^4*d^3*x^3+2/125*b^2*c^6*d^3*x^5-2/5*b*c*d^
3*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))-2/25*b*c*d^3*(-c^2*x^2+1)^(5/2)*(a+b
*arcsin(c*x))-16/5*c^2*d^3*x*(a+b*arcsin(c*x))^2-8/5*c^2*d^3*x*(-c^2*x^2+1)
*(a+b*arcsin(c*x))^2-6/5*c^2*d^3*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2-d^3*(
-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2/x-4*b*c*d^3*(a+b*arcsin(c*x))*arctanh(I*c
*x+(-c^2*x^2+1)^(1/2))+2*I*b^2*c*d^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2
```

```
*I*b^2*c*d^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-22/5*b*c*d^3*(a+b*arcsin(c
*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 329, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.444$, Rules used = {4785, 4743, 4715, 4767, 8, 200, 4787, 4783, 4803, 4268, 2317, 2438}

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^2}\,dx = -4bcd^3\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx)) - \frac{6}{5}c^2d^3x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 - \frac{8}{5}c^2d^3x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 - \frac{2}{25}bcd^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx)) - \frac{2}{5}bcd^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{22}{5}bcd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{x} - \frac{16}{5}c^2d^3x(a+b\arcsin(cx))^2 + 2ib^2cd^3\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) - 2ib^2cd^3\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right) + \frac{2}{125}b^2c^6d^3x^5 - \frac{14}{75}b^2c^4d^3x^3 + \frac{122}{25}b^2c^2d^3x$$

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (122*b^2*c^2*d^3*x)/25 - (14*b^2*c^4*d^3*x^3)/75 + (2*b^2*c^6*d^3*x^5)/125
- (22*b*c*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/5 - (2*b*c*d^3*(1 - c^
2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/5 - (2*b*c*d^3*(1 - c^2*x^2)^(5/2)*(a + b
*ArcSin[c*x]))/25 - (16*c^2*d^3*x*(a + b*ArcSin[c*x])^2)/5 - (8*c^2*d^3*x*(
1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/5 - (6*c^2*d^3*x*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x])^2)/5 - (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/x - 4*b*c*
d^3*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])] + (2*I)*b^2*c*d^3*PolyLo
g[2, -E^(I*ArcSin[c*x])] - (2*I)*b^2*c*d^3*PolyLog[2, E^(I*ArcSin[c*x])]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\text{integral} = -\frac{d^3(1-c^2x^2)^3\,(a+b\arcsin(cx))^2}{x} - (6c^2d)\int (d-c^2dx^2)^2\,(a+b\arcsin(cx))^2\,dx + (2bcd^3)\int \frac{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}{x}\,dx$$

$$
\begin{aligned}
&= \frac{2}{5} b c d^3 \left(1-c^2 x^2\right)^{5/2} (a+b \arcsin(c x))-\frac{6}{5} c^2 d^3 x \left(1-c^2 x^2\right)^2 (a+b \arcsin(c x))^2 \\
&\quad -\frac{d^3 \left(1-c^2 x^2\right)^3 (a+b \arcsin(c x))^2}{x} \\
&\quad -\frac{1}{5}\left(24 c^2 d^2\right) \int \left(d-c^2 d x^2\right) (a+b \arcsin(c x))^2 \, dx \\
&\quad +\left(2 b c d^3\right) \int \frac{\left(1-c^2 x^2\right)^{3/2} (a+b \arcsin(c x))}{x} \, dx \\
&\quad -\frac{1}{5}\left(2 b^2 c^2 d^3\right) \int \left(1-c^2 x^2\right)^2 \, dx+\frac{1}{5}\left(12 b c^3 d^3\right) \int x \left(1-c^2 x^2\right)^{3/2} (a+b \arcsin(c x)) \, dx \\
&= \frac{2}{3} b c d^3 \left(1-c^2 x^2\right)^{3/2} (a+b \arcsin(c x)) \\
&\quad -\frac{2}{25} b c d^3 \left(1-c^2 x^2\right)^{5/2} (a+b \arcsin(c x))-\frac{8}{5} c^2 d^3 x \left(1-c^2 x^2\right) (a+b \arcsin(c x))^2 \\
&\quad -\frac{6}{5} c^2 d^3 x \left(1-c^2 x^2\right)^2 (a+b \arcsin(c x))^2-\frac{d^3 \left(1-c^2 x^2\right)^3 (a+b \arcsin(c x))^2}{x} \\
&\quad +\left(2 b c d^3\right) \int \frac{\sqrt{1-c^2 x^2} (a+b \arcsin(c x))}{x} \, dx-\frac{1}{5}\left(16 c^2 d^3\right) \int (a+b \arcsin(c x))^2 \, dx \\
&\quad -\frac{1}{5}\left(2 b^2 c^2 d^3\right) \int \left(1-2 c^2 x^2+c^4 x^4\right) \, dx+\frac{1}{25}\left(12 b^2 c^2 d^3\right) \int \left(1-c^2 x^2\right)^2 \, dx \\
&\quad -\frac{1}{3}\left(2 b^2 c^2 d^3\right) \int \left(1-c^2 x^2\right) \, dx+\frac{1}{5}\left(16 b c^3 d^3\right) \int x \sqrt{1-c^2 x^2} (a+b \arcsin(c x)) \, dx \\
&= -\frac{16}{15} b^2 c^2 d^3 x+\frac{22}{45} b^2 c^4 d^3 x^3-\frac{2}{25} b^2 c^6 d^3 x^5 \\
&\quad +2 b c d^3 \sqrt{1-c^2 x^2} (a+b \arcsin(c x))-\frac{2}{5} b c d^3 \left(1-c^2 x^2\right)^{3/2} (a+b \arcsin(c x)) \\
&\quad -\frac{2}{25} b c d^3 \left(1-c^2 x^2\right)^{5/2} (a+b \arcsin(c x))-\frac{16}{5} c^2 d^3 x (a+b \arcsin(c x))^2 \\
&\quad -\frac{8}{5} c^2 d^3 x \left(1-c^2 x^2\right) (a+b \arcsin(c x))^2-\frac{6}{5} c^2 d^3 x \left(1-c^2 x^2\right)^2 (a+b \arcsin(c x))^2 \\
&\quad -\frac{d^3 \left(1-c^2 x^2\right)^3 (a+b \arcsin(c x))^2}{x}+\left(2 b c d^3\right) \int \frac{a+b \arcsin(c x)}{x \sqrt{1-c^2 x^2}} \, dx \\
&\quad +\frac{1}{25}\left(12 b^2 c^2 d^3\right) \int \left(1-2 c^2 x^2+c^4 x^4\right) \, dx+\frac{1}{15}\left(16 b^2 c^2 d^3\right) \int \left(1-c^2 x^2\right) \, dx \\
&\quad -\left(2 b^2 c^2 d^3\right) \int 1 \, dx+\frac{1}{5}\left(32 b c^3 d^3\right) \int \frac{x (a+b \arcsin(c x))}{\sqrt{1-c^2 x^2}} \, dx
\end{aligned}
$$

$$= -\frac{38}{25}b^2c^2d^3x - \frac{14}{75}b^2c^4d^3x^3 + \frac{2}{125}b^2c^6d^3x^5 - \frac{22}{5}bcd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{2}{5}bcd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx)) - \frac{2}{25}bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx)) - \frac{16}{5}c^2d^3x(a+b\arcsin(cx))^2 - \frac{8}{5}c^2d^3x(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{6}{5}c^2d^3x(1-c^2x^2)^2(a+b\arcsin(cx))^2 - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{x} + (2bcd^3)\,\mathrm{Subst}\left(\int (a+bx)\csc(x)\,dx, x, \arcsin(cx)\right) + \frac{1}{5}(32b^2c^2d^3)\int 1\,dx$$

$$= \frac{122}{25}b^2c^2d^3x - \frac{14}{75}b^2c^4d^3x^3 + \frac{2}{125}b^2c^6d^3x^5 - \frac{22}{5}bcd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{2}{5}bcd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx)) - \frac{2}{25}bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx)) - \frac{16}{5}c^2d^3x(a+b\arcsin(cx))^2 - \frac{8}{5}c^2d^3x(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{6}{5}c^2d^3x(1-c^2x^2)^2(a+b\arcsin(cx))^2 - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{x} - 4bcd^3(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right) - (2b^2cd^3)\,\mathrm{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right) + (2b^2cd^3)\,\mathrm{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)$$

$$= \frac{122}{25}b^2c^2d^3x - \frac{14}{75}b^2c^4d^3x^3 + \frac{2}{125}b^2c^6d^3x^5 - \frac{22}{5}bcd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{2}{5}bcd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx)) - \frac{2}{25}bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx)) - \frac{16}{5}c^2d^3x(a+b\arcsin(cx))^2 - \frac{8}{5}c^2d^3x(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{6}{5}c^2d^3x(1-c^2x^2)^2(a+b\arcsin(cx))^2 - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{x} - 4bcd^3(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right) + (2ib^2cd^3)\,\mathrm{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right) - (2ib^2cd^3)\,\mathrm{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)$$

$$
\begin{aligned}
&= \frac{122}{25}b^2c^2d^3x - \frac{14}{75}b^2c^4d^3x^3 + \frac{2}{125}b^2c^6d^3x^5 \\
&\quad - \frac{22}{5}bcd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{2}{5}bcd^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) \\
&\quad - \frac{2}{25}bcd^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx)) - \frac{16}{5}c^2d^3x(a+b\arcsin(cx))^2 \\
&\quad - \frac{8}{5}c^2d^3x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 - \frac{6}{5}c^2d^3x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 \\
&\quad - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{x} - 4bcd^3(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right) \\
&\quad + 2ib^2cd^3\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) - 2ib^2cd^3\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.36 (sec) , antiderivative size = 483, normalized size of antiderivative = 1.47

$$
\begin{aligned}
\int \frac{\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))^2}{x^2}\,dx &= \frac{1}{720}d^3\Bigg(-\frac{720a^2}{x} - 2160a^2c^2x + 3460b^2c^2x \\
&\quad + 720a^2c^4x^3 - 144a^2c^6x^5 - \frac{17568}{5}abc\sqrt{1-c^2x^2} \\
&\quad + \frac{2016}{5}abc^3x^2\sqrt{1-c^2x^2} - \frac{288}{5}abc^5x^4\sqrt{1-c^2x^2} \\
&\quad - \frac{1440ab\arcsin(cx)}{x} - 4320abc^2x\arcsin(cx) \\
&\quad + 1440abc^4x^3\arcsin(cx) - 288abc^6x^5\arcsin(cx) \\
&\quad - 3420b^2c\sqrt{1-c^2x^2}\arcsin(cx) \\
&\quad - \frac{720b^2\arcsin(cx)^2}{x} - 1890b^2c^2x\arcsin(cx)^2 \\
&\quad - 1440abc\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right) \\
&\quad + 80b^2c^2x\cos(2\arcsin(cx)) \\
&\quad - 360b^2c^2x\arcsin(cx)^2\cos(2\arcsin(cx)) \\
&\quad - 90b^2c\arcsin(cx)\cos(3\arcsin(cx)) \\
&\quad - \frac{18}{5}b^2c\arcsin(cx)\cos(5\arcsin(cx)) \\
&\quad + 1440b^2c\arcsin(cx)\log\left(1-e^{i\arcsin(cx)}\right) \\
&\quad - 1440b^2c\arcsin(cx)\log\left(1+e^{i\arcsin(cx)}\right) \\
&\quad + 1440ib^2c\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) \\
&\quad - 1440ib^2c\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right) \\
&\quad - 10b^2c\sin(3\arcsin(cx)) \\
&\quad + 45b^2c\arcsin(cx)^2\sin(3\arcsin(cx)) \\
&\quad + \frac{18}{25}b^2c\sin(5\arcsin(cx)) \\
&\quad - 9b^2c\arcsin(cx)^2\sin(5\arcsin(cx))\Bigg)
\end{aligned}
$$

[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^2,x]

[Out] (d^3*((-720*a^2)/x - 2160*a^2*c^2*x + 3460*b^2*c^2*x + 720*a^2*c^4*x^3 - 144*a^2*c^6*x^5 - (17568*a*b*c*Sqrt[1 - c^2*x^2])/5 + (2016*a*b*c^3*x^2*Sqrt[1 - c^2*x^2])/5 - (288*a*b*c^5*x^4*Sqrt[1 - c^2*x^2])/5 - (1440*a*b*ArcSin[c*x])/x - 4320*a*b*c^2*x*ArcSin[c*x] + 1440*a*b*c^4*x^3*ArcSin[c*x] - 288*a*b*c^6*x^5*ArcSin[c*x] - 3420*b^2*c*Sqrt[1 - c^2*x^2]*ArcSin[c*x] - (720*b^2*ArcSin[c*x]^2)/x - 1890*b^2*c^2*x*ArcSin[c*x]^2 - 1440*a*b*c*ArcTanh[Sqrt[1 - c^2*x^2]] + 80*b^2*c^2*x*Cos[2*ArcSin[c*x]] - 360*b^2*c^2*x*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] - 90*b^2*c*ArcSin[c*x]*Cos[3*ArcSin[c*x]] - (18*b^2*c*ArcSin[c*x]*Cos[5*ArcSin[c*x]])/5 + 1440*b^2*c*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - 1440*b^2*c*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + (1440*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])] - (1440*I)*b^2*c*PolyLog[2, E^(I*ArcSin[c*x])] - 10*b^2*c*Sin[3*ArcSin[c*x]] + 45*b^2*c*ArcSin[c*x]^2*Sin[3*ArcSin[c*x]] + (18*b^2*c*Sin[5*ArcSin[c*x]])/25 - 9*b^2*c*ArcSin[c*x]^2*Sin[5*ArcSin[c*x]]))/720

Maple [A] (verified)

Time = 0.19 (sec) , antiderivative size = 416, normalized size of antiderivative = 1.26

method	result
parts	$-d^3a^2\left(\frac{c^6x^5}{5}-c^4x^3+3c^2x+\frac{1}{x}\right)-d^3b^2c\left(\frac{19\left(-i\sqrt{-c^2x^2+1}+cx\right)\left(\arcsin(cx)^2-2+2i\arcsin(cx)\right)}{16}+\right.$
derivativedivides	$c\left(-d^3a^2\left(\frac{c^5x^5}{5}-c^3x^3+3cx+\frac{1}{cx}\right)-d^3b^2\left(\frac{19\left(-i\sqrt{-c^2x^2+1}+cx\right)\left(\arcsin(cx)^2-2+2i\arcsin(cx)\right)}{16}+\right.\right.$
default	$c\left(-d^3a^2\left(\frac{c^5x^5}{5}-c^3x^3+3cx+\frac{1}{cx}\right)-d^3b^2\left(\frac{19\left(-i\sqrt{-c^2x^2+1}+cx\right)\left(\arcsin(cx)^2-2+2i\arcsin(cx)\right)}{16}+\right.\right.$

[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^2,x,method=_RETURNVERBOSE)

[Out] -d^3*a^2*(1/5*c^6*x^5-c^4*x^3+3*c^2*x+1/x)-d^3*b^2*c*(19/16*(-I*(-c^2*x^2+1)^(1/2)+c*x)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))+19/16*(c*x+I*(-c^2*x^2+1)^(1/2))*(arcsin(c*x)^2-2-2*I*arcsin(c*x))+1/c/x*arcsin(c*x)^2+2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+1/200*arcsin(c*x)*cos(5*arcsin(c*x))+1/2000*(25*arcsin(c*x)^2-2)*sin(5*arcsin(c*x))+1/8*arcsin(c*x)*cos(3*arcsin(c*x))+1/48*(9*arcsin(c*x)^2-2)*sin(3*arcsin(c*x)))-2*d^3*a*b*c*(1/5*arcsin(c*x)*c^5*x^5-c^3*x^3*arcsin(c*x)+3*c*x*arcsin(c*x)+1/c/x*arcsin(c*x)+1/25*c^4*x^4*(-c^2*x^2+1)^(1/2)-7/25*c^2*x^2*(-c^2*x^2+1)^(1/2)+61/25*(-c^2*x^2+1)^(1/2)+arctanh(1/(-c^2*x^2+1)^(1/2)))

Fricas [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^2} \, dx = \int -\frac{(c^2dx^2-d)^3 (b\arcsin(cx)+a)^2}{x^2} \, dx$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^
3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arc
sin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a
*b*d^3)*arcsin(c*x))/x^2, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^2} \, dx = -d^3 \left(\int 3a^2c^2 \, dx + \int \left(-\frac{a^2}{x^2}\right) dx + \int \left(-3a^2c^4x^2\right) dx + \int a^2c^6x^4 \, dx + \int 3b^2c^2 \operatorname{asin}^2(cx) \, dx + \int \left(-\frac{b^2 \operatorname{asin}^2(cx)}{x^2}\right) dx + \int 6abc^2 \operatorname{asin}(cx) \, dx + \int \left(-\frac{2ab \operatorname{asin}(cx)}{x^2}\right) dx + \int \left(-3b^2c^4x^2 \operatorname{asin}^2(cx)\right) dx + \int b^2c^6x^4 \operatorname{asin}^2(cx) \, dx + \int \left(-6abc^4x^2 \operatorname{asin}(cx)\right) dx + \int 2abc^6x^4 \operatorname{asin}(cx) \, dx \right)$$

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] -d**3*(Integral(3*a**2*c**2, x) + Integral(-a**2/x**2, x) + Integral(-3*a**
2*c**4*x**2, x) + Integral(a**2*c**6*x**4, x) + Integral(3*b**2*c**2*asin(c
*x)**2, x) + Integral(-b**2*asin(c*x)**2/x**2, x) + Integral(6*a*b*c**2*asi
n(c*x), x) + Integral(-2*a*b*asin(c*x)/x**2, x) + Integral(-3*b**2*c**4*x**
2*asin(c*x)**2, x) + Integral(b**2*c**6*x**4*asin(c*x)**2, x) + Integral(-6
*a*b*c**4*x**2*asin(c*x), x) + Integral(2*a*b*c**6*x**4*asin(c*x), x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^2}\,dx = \int -\frac{(c^2dx^2-d)^3(b\arcsin{(cx)}+a)^2}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima")
```

```
[Out] -1/5*a^2*c^6*d^3*x^5 - 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4
/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*c^6*
d^3 + a^2*c^4*d^3*x^3 + 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/
c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^4*d^3 - 3*b^2*c^2*d^3*x*arcsin(c*x)^
2 + 6*b^2*c^2*d^3*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) - 3*a^2*c^2*d^3*x
- 6*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c*d^3 - 2*(c*log(2*sqrt(-c^2
*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*d^3 - a^2*d^3/x - 1/5*((b
^2*c^6*d^3*x^6 - 5*b^2*c^4*d^3*x^4 + 5*b^2*d^3)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))^2 + 5*x*integrate(2/5*(b^2*c^7*d^3*x^6 - 5*b^2*c^5*d^3*x^4
+ 5*b^2*c*d^3)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))/(c^2*x^3 - x), x))/x
```

Giac [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^2}\,dx = \text{Timed out}$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^3}{x^2}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x^2, x)
```

3.181 $\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))^2}{x^3}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 371

$$\begin{aligned}\int \frac{(d-c^2dx^2)^3\,(a+b\arcsin(cx))^2}{x^3}\,dx &= -\frac{21}{32}b^2c^4d^3x^2+\frac{1}{32}b^2c^6d^3x^4\\ &+\frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\\ &-\frac{7}{8}bc^3d^3x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\\ &-\frac{bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{x}\\ &+\frac{3}{32}c^2d^3(a+b\arcsin(cx))^2\\ &-\frac{3}{2}c^2d^3(1-c^2x^2)(a+b\arcsin(cx))^2\\ &-\frac{3}{4}c^2d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2\\ &-\frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{2x^2}\\ &+\frac{ic^2d^3(a+b\arcsin(cx))^3}{b}\\ &-3c^2d^3(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right)\\ &+b^2c^2d^3\log(x)\\ &+3ibc^2d^3(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\\ &-\frac{3}{2}b^2c^2d^3\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)\end{aligned}$$

```
[Out] -21/32*b^2*c^4*d^3*x^2+1/32*b^2*c^6*d^3*x^4-7/8*b*c^3*d^3*x*(-c^2*x^2+1)^(3
/2)*(a+b*arcsin(c*x))-b*c*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))/x+3/32*c
```

```
^2*d^3*(a+b*arcsin(c*x))^2-3/2*c^2*d^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2-3/4
*c^2*d^3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2-1/2*d^3*(-c^2*x^2+1)^3*(a+b*arc
sin(c*x))^2/x^2+I*c^2*d^3*(a+b*arcsin(c*x))^3/b-3*c^2*d^3*(a+b*arcsin(c*x))
^2*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+b^2*c^2*d^3*ln(x)+3*I*b*c^2*d^3*(a+b*
arcsin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-3/2*b^2*c^2*d^3*polylo
g(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)+3/16*b*c^3*d^3*x*(a+b*arcsin(c*x))*(-c^2*
x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 371, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.556$, Rules used = {4785, 4787, 4721, 3798, 2221, 2611, 2320, 6724, 4741, 4737, 30, 4743, 14, 272, 45}

$$\begin{aligned}\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^3}\,dx =\ & 3ibc^2d^3\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx)) \\ & -\frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 \\ & -\frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\ & -\frac{bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{x} \\ & -\frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{2x^2} \\ & +\frac{ic^2d^3(a+b\arcsin(cx))^3}{b} \\ & +\frac{3}{32}c^2d^3(a+b\arcsin(cx))^2 \\ & -3c^2d^3\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))^2 \\ & -\frac{7}{8}bc^3d^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) \\ & +\frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\ & -\frac{3}{2}b^2c^2d^3\,\text{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)+\frac{1}{32}b^2c^6d^3x^4 \\ & -\frac{21}{32}b^2c^4d^3x^2+b^2c^2d^3\log(x)\end{aligned}$$

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (-21*b^2*c^4*d^3*x^2)/32 + (b^2*c^6*d^3*x^4)/32 + (3*b*c^3*d^3*x*Sqrt[1 - c
^2*x^2]*(a + b*ArcSin[c*x]))/16 - (7*b*c^3*d^3*x*(1 - c^2*x^2)^(3/2)*(a + b
*ArcSin[c*x]))/8 - (b*c*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/x + (3
*c^2*d^3*(a + b*ArcSin[c*x])^2)/32 - (3*c^2*d^3*(1 - c^2*x^2)*(a + b*ArcSin
[c*x])^2)/2 - (3*c^2*d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/4 - (d^3*(1
```

```
- c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(2*x^2) + (I*c^2*d^3*(a + b*ArcSin[c*x
])^3)/b - 3*c^2*d^3*(a + b*ArcSin[c*x])^2*Log[1 - E^((2*I)*ArcSin[c*x])] +
b^2*c^2*d^3*Log[x] + (3*I)*b*c^2*d^3*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I
)*ArcSin[c*x])] - (3*b^2*c^2*d^3*PolyLog[3, E^((2*I)*ArcSin[c*x])])/2
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
```

```
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{d^3(1-c^2x^2)^3\,(a+b\arcsin(cx))^2}{2x^2} - (3c^2d)\int \frac{(d-c^2dx^2)^2\,(a+b\arcsin(cx))^2}{x}\,dx \\
&\quad + (bcd^3)\int \frac{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}{x^2}\,dx \\
&= -\frac{bcd^3(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}{x} - \frac{3}{4}c^2d^3(1-c^2x^2)^2\,(a+b\arcsin(cx))^2 \\
&\quad - \frac{d^3(1-c^2x^2)^3\,(a+b\arcsin(cx))^2}{2x^2} - (3c^2d^2)\int \frac{(d-c^2dx^2)\,(a+b\arcsin(cx))^2}{x}\,dx \\
&\quad + (b^2c^2d^3)\int \frac{(1-c^2x^2)^2}{x}\,dx + \frac{1}{2}(3bc^3d^3)\int (1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\,dx \\
&\quad - (5bc^3d^3)\int (1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\,dx
\end{aligned}
$$

$$= -\frac{7}{8}bc^3d^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{x} - \frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 - \frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{2x^2} - \left(3c^2d^3\right)\int\frac{(a+b\arcsin(cx))^2}{x}\,dx + \frac{1}{2}\left(b^2c^2d^3\right)\text{Subst}\left(\int\frac{\left(1-c^2x\right)^2}{x}\,dx, x, x^2\right) + \frac{1}{8}\left(9bc^3d^3\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx + \left(3bc^3d^3\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx - \frac{1}{4}\left(15bc^3d^3\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx - \frac{1}{8}\left(3b^2c^4d^3\right)\int x\left(1-c^2x^2\right)\,dx + \frac{1}{4}\left(5b^2c^4d^3\right)\int x\left(1-c^2x^2\right)\,dx$$

$$= \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{7}{8}bc^3d^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{x} - \frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 - \frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{2x^2} - \left(3c^2d^3\right)\text{Subst}\left(\int(a+bx)^2\cot(x)\,dx, x, \arcsin(cx)\right) + \frac{1}{2}\left(b^2c^2d^3\right)\text{Subst}\left(\int\left(-2c^2+\frac{1}{x}+c^4x\right)dx, x, x^2\right) + \frac{1}{16}\left(9bc^3d^3\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx + \frac{1}{2}\left(3bc^3d^3\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx - \frac{1}{8}\left(15bc^3d^3\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx - \frac{1}{8}\left(3b^2c^4d^3\right)\int\left(x-c^2x^3\right)dx - \frac{1}{16}\left(9b^2c^4d^3\right)\int x\,dx + \frac{1}{4}\left(5b^2c^4d^3\right)\int\left(x-c^2x^3\right)dx - \frac{1}{2}\left(3b^2c^4d^3\right)\int x\,dx + \frac{1}{8}\left(15b^2c^4d^3\right)\int x\,dx$$

$$
\begin{aligned}
&= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad - \frac{7}{8}bc^3d^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{x} \\
&\quad + \frac{3}{32}c^2d^3(a+b\arcsin(cx))^2 - \frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad - \frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 - \frac{d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2}{2x^2} \\
&\quad + \frac{ic^2d^3(a+b\arcsin(cx))^3}{b} + b^2c^2d^3\log(x) \\
&\quad + \left(6ic^2d^3\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)^2}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad - \frac{7}{8}bc^3d^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{x} \\
&\quad + \frac{3}{32}c^2d^3(a+b\arcsin(cx))^2 - \frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad - \frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 - \frac{d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2}{2x^2} \\
&\quad + \frac{ic^2d^3(a+b\arcsin(cx))^3}{b} - 3c^2d^3(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) \\
&\quad + b^2c^2d^3\log(x) + \left(6bc^2d^3\right)\text{Subst}\left(\int (a+bx)\log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad - \frac{7}{8}bc^3d^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{x} \\
&\quad + \frac{3}{32}c^2d^3(a+b\arcsin(cx))^2 - \frac{3}{2}c^2d^3\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad - \frac{3}{4}c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2 - \frac{d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2}{2x^2} \\
&\quad + \frac{ic^2d^3(a+b\arcsin(cx))^3}{b} - 3c^2d^3(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) \\
&\quad + b^2c^2d^3\log(x) + 3ibc^2d^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right) \\
&\quad - \left(3ib^2c^2d^3\right)\text{Subst}\left(\int \text{PolyLog}\left(2, e^{2ix}\right)\,dx, x, \arcsin(cx)\right)
\end{aligned}
$$

$$= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{7}{8}bc^3d^3x(1-c^2x^2)^{3/2}(a+b\arcsin(cx)) - \frac{bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{x} + \frac{3}{32}c^2d^3(a+b\arcsin(cx))^2 - \frac{3}{2}c^2d^3(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{3}{4}c^2d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2 - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{2x^2} + \frac{ic^2d^3(a+b\arcsin(cx))^3}{b} - 3c^2d^3(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) + b^2c^2d^3\log(x) + 3ibc^2d^3(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) - \frac{1}{2}(3b^2c^2d^3)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)$$

$$= -\frac{21}{32}b^2c^4d^3x^2 + \frac{1}{32}b^2c^6d^3x^4 + \frac{3}{16}bc^3d^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{7}{8}bc^3d^3x(1-c^2x^2)^{3/2}(a+b\arcsin(cx)) - \frac{bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{x} + \frac{3}{32}c^2d^3(a+b\arcsin(cx))^2 - \frac{3}{2}c^2d^3(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{3}{4}c^2d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2 - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{2x^2} + \frac{ic^2d^3(a+b\arcsin(cx))^3}{b} - 3c^2d^3(a+b\arcsin(cx))^2\log\left(1-e^{2i\arcsin(cx)}\right) + b^2c^2d^3\log(x) + 3ibc^2d^3(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) - \frac{3}{2}b^2c^2d^3\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.56 (sec) , antiderivative size = 556, normalized size of antiderivative = 1.50

$$\int\frac{(d-c^2dx^2)^3(a+b\arcsin(cx))^2}{x^3}\,dx = -\frac{d^3\left(128a^2-32ib^2c^2\pi^3x^2-384a^2c^4x^4+64a^2c^6x^6+256abcx\sqrt{1-c^2x^2}-336abc^3x^3\sqrt{1-c^2x^2}+32abc^5\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] -1/256*(d^3*(128*a^2 - (32*I)*b^2*c^2*Pi^3*x^2 - 384*a^2*c^4*x^4 + 64*a^2*c
^6*x^6 + 256*a*b*c*x*Sqrt[1 - c^2*x^2] - 336*a*b*c^3*x^3*Sqrt[1 - c^2*x^2]
+ 32*a*b*c^5*x^5*Sqrt[1 - c^2*x^2] + 256*a*b*ArcSin[c*x] - 768*a*b*c^4*x^4*
ArcSin[c*x] + 128*a*b*c^6*x^6*ArcSin[c*x] + 256*b^2*c*x*Sqrt[1 - c^2*x^2]*A
rcSin[c*x] + 128*b^2*ArcSin[c*x]^2 - (768*I)*a*b*c^2*x^2*ArcSin[c*x]^2 + (2
```

```
56*I)*b^2*c^2*x^2*ArcSin[c*x]^3 + 672*a*b*c^2*x^2*ArcTan[(c*x)/(-1 + Sqrt[1
 - c^2*x^2])] - 80*b^2*c^2*x^2*Cos[2*ArcSin[c*x]] + 160*b^2*c^2*x^2*ArcSin[
c*x]^2*Cos[2*ArcSin[c*x]] - b^2*c^2*x^2*Cos[4*ArcSin[c*x]] + 8*b^2*c^2*x^2*
ArcSin[c*x]^2*Cos[4*ArcSin[c*x]] + 768*b^2*c^2*x^2*ArcSin[c*x]^2*Log[1 - E^
((-2*I)*ArcSin[c*x])] + 1536*a*b*c^2*x^2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSi
n[c*x])] + 768*a^2*c^2*x^2*Log[x] - 256*b^2*c^2*x^2*Log[c*x] + (768*I)*b^2*
c^2*x^2*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] - (768*I)*a*b*c^2*x^
2*PolyLog[2, E^((2*I)*ArcSin[c*x])] + 384*b^2*c^2*x^2*PolyLog[3, E^((-2*I)*
ArcSin[c*x])] - 160*b^2*c^2*x^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]] - 4*b^2*c^2*
x^2*ArcSin[c*x]*Sin[4*ArcSin[c*x]]))/x^2
```

Maple [A] (verified)

Time = 0.33 (sec) , antiderivative size = 708, normalized size of antiderivative = 1.91

method	result
derivativedivides	$c^2\left(-d^3a^2\left(\frac{c^4x^4}{4}-\frac{3c^2x^2}{2}+\frac{1}{2c^2x^2}+3\ln(cx)\right)-d^3b^2\left(-6i\arcsin(cx)\operatorname{polylog}\left(2,-icx-\sqrt{\right.\right.\right.$
default	$c^2\left(-d^3a^2\left(\frac{c^4x^4}{4}-\frac{3c^2x^2}{2}+\frac{1}{2c^2x^2}+3\ln(cx)\right)-d^3b^2\left(-6i\arcsin(cx)\operatorname{polylog}\left(2,-icx-\sqrt{\right.\right.\right.$
parts	$-d^3a^2\left(\frac{c^6x^4}{4}-\frac{3c^4x^2}{2}+\frac{1}{2x^2}+3c^2\ln(x)\right)-d^3b^2c^2\left(-6i\arcsin(cx)\operatorname{polylog}\left(2,-icx-\sqrt{-}\right.\right.$

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(-d^3*a^2*(1/4*c^4*x^4-3/2*c^2*x^2+1/2/c^2/x^2+3*ln(c*x))-d^3*b^2*(-6*I
*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-5/32*(2*I*arcsin(c*x)+2*a
rcsin(c*x)^2-1)*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)-5/32*(2*I*c*x*(-c^
2*x^2+1)^(1/2)+2*c^2*x^2-1)*(-2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)+1/2*arcsin
(c*x)*(-2*I*c^2*x^2+2*c*x*(-c^2*x^2+1)^(1/2)+arcsin(c*x))/c^2/x^2-ln(I*c*x+
(-c^2*x^2+1)^(1/2)-1)+2*ln(I*c*x+(-c^2*x^2+1)^(1/2))-ln(1+I*c*x+(-c^2*x^2+1
)^(1/2))-I*arcsin(c*x)^3+3*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-6*I
*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+6*polylog(3,-I*c*x-(-c^2*x
^2+1)^(1/2))+3*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+6*polylog(3,I*c
*x+(-c^2*x^2+1)^(1/2))+1/256*(8*arcsin(c*x)^2-1)*cos(4*arcsin(c*x))-1/64*ar
csin(c*x)*sin(4*arcsin(c*x)))-2*d^3*a*b*(-3/2*I*arcsin(c*x)^2-5/32*(I+2*arc
sin(c*x))*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)-5/32*(2*I*c*x*(-c^2*x^2+
1)^(1/2)+2*c^2*x^2-1)*(-I+2*arcsin(c*x))+1/2*(-I*c^2*x^2+c*x*(-c^2*x^2+1)^(
1/2)+arcsin(c*x))/c^2/x^2+3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+3*ar
csin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-3*I*polylog(2,-I*c*x-(-c^2*x^2+1)^
(1/2))-3*I*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+1/32*arcsin(c*x)*cos(4*arcsi
n(c*x))-1/128*sin(4*arcsin(c*x))))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^3}\,dx = \int -\frac{(c^2dx^2-d)^3(b\arcsin(cx)+a)^2}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^
3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arc
sin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a
*b*d^3)*arcsin(c*x))/x^3, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^3}\,dx = -d^3\left(\int \left(-\frac{a^2}{x^3}\right)dx + \int \frac{3a^2c^2}{x}\,dx + \int \left(-3a^2c^4x\right)dx + \int a^2c^6x^3\,dx + \int \left(-\frac{b^2\operatorname{asin}^2(cx)}{x^3}\right)dx + \int \left(-\frac{2ab\operatorname{asin}(cx)}{x^3}\right)dx + \int \frac{3b^2c^2\operatorname{asin}^2(cx)}{x}\,dx + \int \left(-3b^2c^4x\operatorname{asin}^2(cx)\right)dx + \int b^2c^6x^3\operatorname{asin}^2(cx)\,dx + \int \frac{6abc^2\operatorname{asin}(cx)}{x}\,dx + \int \left(-6abc^4x\operatorname{asin}(cx)\right)dx + \int 2abc^6x^3\operatorname{asin}(cx)\,dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] -d**3*(Integral(-a**2/x**3, x) + Integral(3*a**2*c**2/x, x) + Integral(-3*a
**2*c**4*x, x) + Integral(a**2*c**6*x**3, x) + Integral(-b**2*asin(c*x)**2/
x**3, x) + Integral(-2*a*b*asin(c*x)/x**3, x) + Integral(3*b**2*c**2*asin(c
*x)**2/x, x) + Integral(-3*b**2*c**4*x*asin(c*x)**2, x) + Integral(b**2*c**
6*x**3*asin(c*x)**2, x) + Integral(6*a*b*c**2*asin(c*x)/x, x) + Integral(-6
*a*b*c**4*x*asin(c*x), x) + Integral(2*a*b*c**6*x**3*asin(c*x), x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^3}\,dx = \int -\frac{(c^2dx^2-d)^3(b\arcsin(cx)+a)^2}{x^3}\,dx$$

[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima")

[Out] -1/4*a^2*c^6*d^3*x^4 + 3/2*a^2*c^4*d^3*x^2 - 3*a^2*c^2*d^3*log(x) - a*b*d^3
*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) - 1/2*a^2*d^3/x^2 - integrate((
(b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*
x^4 + 3*a*b*c^2*d^3*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/x^3, x
)

Giac [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^3}\,dx = \int -\frac{(c^2dx^2-d)^3(b\arcsin(cx)+a)^2}{x^3}\,dx$$

[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")

[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)^2/x^3, x)

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^3}{x^3}\,dx$$

[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x^3,x)

[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x^3, x)

3.182 $\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))^2}{x^4}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 348

$$
\begin{aligned}
\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))^2}{x^4}\,dx = & -\frac{b^2c^2d^3}{3x}-\frac{50}{9}b^2c^4d^3x+\frac{2}{27}b^2c^6d^3x^3 \\
& +5bc^3d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
& -\frac{1}{9}bc^3d^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx)) \\
& -\frac{bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{3x^2} \\
& +\frac{16}{3}c^4d^3x(a+b\arcsin(cx))^2 \\
& +\frac{8}{3}c^4d^3x(1-c^2x^2)(a+b\arcsin(cx))^2 \\
& +\frac{2c^2d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{x} \\
& -\frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{3x^3} \\
& +\frac{34}{3}bc^3d^3(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right) \\
& -\frac{17}{3}ib^2c^3d^3\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) \\
& +\frac{17}{3}ib^2c^3d^3\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)
\end{aligned}
$$

```
[Out] -1/3*b^2*c^2*d^3/x-50/9*b^2*c^4*d^3*x+2/27*b^2*c^6*d^3*x^3-1/9*b*c^3*d^3*(-
c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))-1/3*b*c*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcs
in(c*x))/x^2+16/3*c^4*d^3*x*(a+b*arcsin(c*x))^2+8/3*c^4*d^3*x*(-c^2*x^2+1)*
(a+b*arcsin(c*x))^2+2*c^2*d^3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/x-1/3*d^3*
(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2/x^3+34/3*b*c^3*d^3*(a+b*arcsin(c*x))*arc
```

```
tanh(I*c*x+(-c^2*x^2+1)^(1/2))-17/3*I*b^2*c^3*d^3*polylog(2,-I*c*x-(-c^2*x^
2+1)^(1/2))+17/3*I*b^2*c^3*d^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+5*b*c^3*
d^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.62 (sec) , antiderivative size = 348, normalized size of antiderivative = 1.00, number of steps used = 31, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {4785, 4743, 4715, 4767, 8, 4787, 4783, 4803, 4268, 2317, 2438, 276}

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^4} dx = \frac{34}{3}bc^3d^3\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx)) + \frac{16}{3}c^4d^3x(a+b\arcsin(cx))^2 + \frac{2c^2d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{x} - \frac{bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{3x^2} - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{3x^3} + \frac{8}{3}c^4d^3x(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{1}{9}bc^3d^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx)) + 5bc^3d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{17}{3}ib^2c^3d^3\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) + \frac{17}{3}ib^2c^3d^3\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right) + \frac{2}{27}b^2c^6d^3x^3 - \frac{50}{9}b^2c^4d^3x - \frac{b^2c^2d^3}{3x}$$

```
[In] Int[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -1/3*(b^2*c^2*d^3)/x - (50*b^2*c^4*d^3*x)/9 + (2*b^2*c^6*d^3*x^3)/27 + 5*b*
c^3*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (b*c^3*d^3*(1 - c^2*x^2)^(3
/2)*(a + b*ArcSin[c*x]))/9 - (b*c*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x
]))/(3*x^2) + (16*c^4*d^3*x*(a + b*ArcSin[c*x])^2)/3 + (8*c^4*d^3*x*(1 - c^
2*x^2)*(a + b*ArcSin[c*x])^2)/3 + (2*c^2*d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[
c*x])^2)/x - (d^3*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(3*x^3) + (34*b*c^
3*d^3*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/3 - ((17*I)/3)*b^2*c^
3*d^3*PolyLog[2, -E^(I*ArcSin[c*x])] + ((17*I)/3)*b^2*c^3*d^3*PolyLog[2, E^
(I*ArcSin[c*x])]
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
```

```
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rubi steps

$$\text{integral} = -\frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{3x^3} - (2c^2d)\int \frac{(d-c^2dx^2)^2(a+b\arcsin(cx))^2}{x^2}\,dx + \frac{1}{3}(2bcd^3)\int \frac{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{x^3}\,dx$$

$$= -\frac{bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{3x^2} + \frac{2c^2d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{x} - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{3x^3} + (8c^4d^2)\int (d-c^2dx^2)(a+b\arcsin(cx))^2\,dx + \frac{1}{3}(b^2c^2d^3)\int \frac{(1-c^2x^2)^2}{x^2}\,dx - \frac{1}{3}(5bc^3d^3)\int \frac{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{x}\,dx - (4bc^3d^3)\int \frac{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{x}\,dx$$

$$= -\frac{17}{9}bc^3d^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx)) - \frac{bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{3x^2} + \frac{8}{3}c^4d^3x(1-c^2x^2)(a+b\arcsin(cx))^2 + \frac{2c^2d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{x} - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{3x^3} + \frac{1}{3}(b^2c^2d^3)\int \left(-2c^2+\frac{1}{x^2}+c^4x^2\right)dx - \frac{1}{3}(5bc^3d^3)\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x}\,dx - (4bc^3d^3)\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x}\,dx + \frac{1}{3}(16c^4d^3)\int (a+b\arcsin(cx))^2\,dx + \frac{1}{9}(5b^2c^4d^3)\int (1-c^2x^2)\,dx + \frac{1}{3}(4b^2c^4d^3)\int (1-c^2x^2)\,dx - \frac{1}{3}(16bc^5d^3)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx$$

$$
\begin{aligned}
&= -\frac{b^2c^2d^3}{3x} + \frac{11}{9}b^2c^4d^3x - \frac{14}{27}b^2c^6d^3x^3 - \frac{17}{3}bc^3d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad - \frac{1}{9}bc^3d^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{3x^2} \\
&\quad + \frac{16}{3}c^4d^3x(a+b\arcsin(cx))^2 + \frac{8}{3}c^4d^3x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad + \frac{2c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2}{x} - \frac{d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2}{3x^3} \\
&\quad - \frac{1}{3}\left(5bc^3d^3\right)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx - \left(4bc^3d^3\right)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx \\
&\quad + \frac{1}{3}\left(5b^2c^4d^3\right)\int 1\,dx - \frac{1}{9}\left(16b^2c^4d^3\right)\int\left(1-c^2x^2\right)\,dx + \left(4b^2c^4d^3\right)\int 1\,dx \\
&\quad - \frac{1}{3}\left(32bc^5d^3\right)\int\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{b^2c^2d^3}{3x} + \frac{46}{9}b^2c^4d^3x + \frac{2}{27}b^2c^6d^3x^3 + 5bc^3d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad - \frac{1}{9}bc^3d^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{bcd^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{3x^2} \\
&\quad + \frac{16}{3}c^4d^3x(a+b\arcsin(cx))^2 + \frac{8}{3}c^4d^3x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad + \frac{2c^2d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))^2}{x} - \frac{d^3\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2}{3x^3} \\
&\quad - \frac{1}{3}\left(5bc^3d^3\right)\operatorname{Subst}\left(\int(a+bx)\csc(x)\,dx, x, \arcsin(cx)\right) \\
&\quad - \left(4bc^3d^3\right)\operatorname{Subst}\left(\int(a+bx)\csc(x)\,dx, x, \arcsin(cx)\right) - \frac{1}{3}\left(32b^2c^4d^3\right)\int 1\,dx
\end{aligned}
$$

$$= -\frac{b^2c^2d^3}{3x} - \frac{50}{9}b^2c^4d^3x + \frac{2}{27}b^2c^6d^3x^3 + 5bc^3d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{1}{9}bc^3d^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{3x^2} + \frac{16}{3}c^4d^3x(a+b\arcsin(cx))^2 + \frac{8}{3}c^4d^3x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{2c^2d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{x} - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{3x^3} + \frac{34}{3}bc^3d^3(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right) + \frac{1}{3}\left(5b^2c^3d^3\right)\text{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right) - \frac{1}{3}\left(5b^2c^3d^3\right)\text{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right) + \left(4b^2c^3d^3\right)\text{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right) - \left(4b^2c^3d^3\right)\text{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)$$

$$= -\frac{b^2c^2d^3}{3x} - \frac{50}{9}b^2c^4d^3x + \frac{2}{27}b^2c^6d^3x^3 + 5bc^3d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{1}{9}bc^3d^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{3x^2} + \frac{16}{3}c^4d^3x(a+b\arcsin(cx))^2 + \frac{8}{3}c^4d^3x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{2c^2d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{x} - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{3x^3} + \frac{34}{3}bc^3d^3(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right) - \frac{1}{3}\left(5ib^2c^3d^3\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right) + \frac{1}{3}\left(5ib^2c^3d^3\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right) - \left(4ib^2c^3d^3\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right) + \left(4ib^2c^3d^3\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)$$

$$= -\frac{b^2c^2d^3}{3x} - \frac{50}{9}b^2c^4d^3x + \frac{2}{27}b^2c^6d^3x^3 + 5bc^3d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{1}{9}bc^3d^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{3x^2} + \frac{16}{3}c^4d^3x(a+b\arcsin(cx))^2 + \frac{8}{3}c^4d^3x\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{2c^2d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{x} - \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2}{3x^3} + \frac{34}{3}bc^3d^3(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right) - \frac{17}{3}ib^2c^3d^3\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) + \frac{17}{3}ib^2c^3d^3\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.89 (sec) , antiderivative size = 480, normalized size of antiderivative = 1.38

$$\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))^2}{x^4}\,dx = -\frac{d^3\left(9a^2-81a^2c^2x^2+9b^2c^2x^2-81a^2c^4x^4+150b^2c^4x^4+9a^2c^6x^6-2b^2c^6x^6+9abcx\sqrt{1-c^2x^2}-150abc^3\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -1/27*(d^3*(9*a^2 - 81*a^2*c^2*x^2 + 9*b^2*c^2*x^2 - 81*a^2*c^4*x^4 + 150*b
^2*c^4*x^4 + 9*a^2*c^6*x^6 - 2*b^2*c^6*x^6 + 9*a*b*c*x*Sqrt[1 - c^2*x^2] -
150*a*b*c^3*x^3*Sqrt[1 - c^2*x^2] + 6*a*b*c^5*x^5*Sqrt[1 - c^2*x^2] + 18*a*
b*ArcSin[c*x] - 162*a*b*c^2*x^2*ArcSin[c*x] - 162*a*b*c^4*x^4*ArcSin[c*x] +
 18*a*b*c^6*x^6*ArcSin[c*x] + 9*b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x] - 150
*b^2*c^3*x^3*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + 6*b^2*c^5*x^5*Sqrt[1 - c^2*x^2
]*ArcSin[c*x] + 9*b^2*ArcSin[c*x]^2 - 81*b^2*c^2*x^2*ArcSin[c*x]^2 - 81*b^2
*c^4*x^4*ArcSin[c*x]^2 + 9*b^2*c^6*x^6*ArcSin[c*x]^2 - 153*a*b*c^3*x^3*ArcT
anh[Sqrt[1 - c^2*x^2]] + 153*b^2*c^3*x^3*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*
x])] - 153*b^2*c^3*x^3*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + (153*I)*b^2
*c^3*x^3*PolyLog[2, -E^(I*ArcSin[c*x])] - (153*I)*b^2*c^3*x^3*PolyLog[2, E^
(I*ArcSin[c*x])]))/x^3
```

Maple [A] (verified)

Time = 0.27 (sec) , antiderivative size = 488, normalized size of antiderivative = 1.40

method	result
derivativedivides	$c^3\left(-d^3a^2\left(\frac{c^3x^3}{3}-3cx+\frac{1}{3c^3x^3}-\frac{3}{cx}\right)+\frac{2d^3b^2c^3x^3}{27}-\frac{50d^3b^2cx}{9}-\frac{d^3b^2}{3cx}-\frac{2d^3b^2\arcsin(cx)\sqrt{-c^2x^2+}}{9}\right.$
default	$c^3\left(-d^3a^2\left(\frac{c^3x^3}{3}-3cx+\frac{1}{3c^3x^3}-\frac{3}{cx}\right)+\frac{2d^3b^2c^3x^3}{27}-\frac{50d^3b^2cx}{9}-\frac{d^3b^2}{3cx}-\frac{2d^3b^2\arcsin(cx)\sqrt{-c^2x^2+}}{9}\right.$
parts	$-d^3a^2\left(\frac{c^6x^3}{3}-3c^4x-\frac{3c^2}{x}+\frac{1}{3x^3}\right)-\frac{17ib^2c^3d^3\,\mathrm{polylog}\left(2,-icx-\sqrt{-c^2x^2+1}\right)}{3}+\frac{17ib^2c^3d^3\,\mathrm{polylog}\left(2,icx-\right.}{3}$

```
[In] int((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(-d^3*a^2*(1/3*c^3*x^3-3*c*x+1/3/c^3/x^3-3/c/x)+2/27*d^3*b^2*c^3*x^3-50
/9*d^3*b^2*c*x-1/3*d^3*b^2/c/x-2/9*d^3*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c
^2*x^2+3*d^3*b^2/c/x*arcsin(c*x)^2-1/3*d^3*b^2/c^3/x^3*arcsin(c*x)^2-1/3*d^
3*b^2*arcsin(c*x)^2*c^3*x^3+3*d^3*b^2*arcsin(c*x)^2*c*x-17/3*d^3*b^2*arcsin
(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-17/3*I*d^3*b^2*polylog(2,-I*c*x-(-c^2*
x^2+1)^(1/2))+17/3*d^3*b^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+17/3*
I*d^3*b^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/3*d^3*b^2/c^2/x^2*arcsin(c*
x)*(-c^2*x^2+1)^(1/2)+50/9*d^3*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-2*d^3*a*b
*(1/3*c^3*x^3*arcsin(c*x)-3*c*x*arcsin(c*x)+1/3/c^3/x^3*arcsin(c*x)-3/c/x*a
rcsin(c*x)+1/9*c^2*x^2*(-c^2*x^2+1)^(1/2)-25/9*(-c^2*x^2+1)^(1/2)+1/6/c^2/x
^2*(-c^2*x^2+1)^(1/2)-17/6*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^3\,(a+b\arcsin(cx))^2}{x^4}\,dx=\int -\frac{(c^2dx^2-d)^3(b\arcsin{(cx)}+a)^2}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^
3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arc
sin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a
*b*d^3)*arcsin(c*x))/x^4, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^4}\,dx = -d^3\left(\int (-3a^2c^4)\,dx + \int \left(-\frac{a^2}{x^4}\right)dx + \int \frac{3a^2c^2}{x^2}\,dx + \int a^2c^6x^2\,dx + \int (-3b^2c^4\operatorname{asin}^2(cx))\,dx + \int \left(-\frac{b^2\operatorname{asin}^2(cx)}{x^4}\right)dx + \int (-6abc^4\operatorname{asin}(cx))\,dx + \int \left(-\frac{2ab\operatorname{asin}(cx)}{x^4}\right)dx + \int \frac{3b^2c^2\operatorname{asin}^2(cx)}{x^2}\,dx + \int b^2c^6x^2\operatorname{asin}^2(cx)\,dx + \int \frac{6abc^2\operatorname{asin}(cx)}{x^2}\,dx + \int 2abc^6x^2\operatorname{asin}(cx)\,dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2/x**4,x)
[Out] -d**3*(Integral(-3*a**2*c**4, x) + Integral(-a**2/x**4, x) + Integral(3*a**
2*c**2/x**2, x) + Integral(a**2*c**6*x**2, x) + Integral(-3*b**2*c**4*asin(
c*x)**2, x) + Integral(-b**2*asin(c*x)**2/x**4, x) + Integral(-6*a*b*c**4*a
sin(c*x), x) + Integral(-2*a*b*asin(c*x)/x**4, x) + Integral(3*b**2*c**2*as
in(c*x)**2/x**2, x) + Integral(b**2*c**6*x**2*asin(c*x)**2, x) + Integral(6
*a*b*c**2*asin(c*x)/x**2, x) + Integral(2*a*b*c**6*x**2*asin(c*x), x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^3 (a+b\arcsin(cx))^2}{x^4}\,dx = \int -\frac{(c^2dx^2-d)^3(b\arcsin(cx)+a)^2}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima")
[Out] -1/3*a^2*c^6*d^3*x^3 - 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c
^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*c^6*d^3 + 3*b^2*c^4*d^3*x*arcsin(c*x)^2
 - 6*b^2*c^4*d^3*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + 3*a^2*c^4*d^3*x +
 6*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*c^3*d^3 + 6*(c*log(2*sqrt(-c^
2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*a*b*c^2*d^3 - 1/3*((c^2*log(
2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)/x^2)*c + 2*arc
sin(c*x)/x^3)*a*b*d^3 + 3*a^2*c^2*d^3/x - 1/3*a^2*d^3/x^3 - 1/3*(3*x^3*inte
grate(2/3*(b^2*c^7*d^3*x^6 - 9*b^2*c^3*d^3*x^2 + b^2*c*d^3)*sqrt(c*x + 1)*s
qrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^5 - x^3), x
) + (b^2*c^6*d^3*x^6 - 9*b^2*c^2*d^3*x^2 + b^2*d^3)*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))^2)/x^3
```

Giac [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))^2}{x^4}\,dx = \text{Timed out}$$

```
[In] integrate((-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^3(a+b\arcsin(cx))^2}{x^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^3}{x^4}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x^4,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^3)/x^4, x)
```

3.183 $\int \frac{x^4(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 297

$$\int \frac{x^4(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \frac{22b^2x}{9c^4d}+\frac{2b^2x^3}{27c^2d}-\frac{22b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^5d} - \frac{2bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d} - \frac{x(a+b\arcsin(cx))^2}{c^4d}-\frac{x^3(a+b\arcsin(cx))^2}{3c^2d} - \frac{2i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d} + \frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^5d} - \frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^5d} - \frac{2b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{c^5d}+\frac{2b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{c^5d}$$

```
[Out] 22/9*b^2*x/c^4/d+2/27*b^2*x^3/c^2/d-x*(a+b*arcsin(c*x))^2/c^4/d-1/3*x^3*(a+
b*arcsin(c*x))^2/c^2/d-2*I*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1
/2))/c^5/d+2*I*b*(a+b*arcsin(c*x))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
/c^5/d-2*I*b*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/
d-2*b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d+2*b^2*polylog(3,I*(I
*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d-22/9*b*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)
/c^5/d-2/9*b*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3/d
```

Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 297, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4795, 4749, 4266, 2611, 2320, 6724, 4767, 8, 30}

$$\begin{aligned}\int \frac{x^4(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = &-\frac{2i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{c^5d}\\&+\frac{2ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^5d}\\&-\frac{2ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^5d}\\&-\frac{x(a+b\arcsin(cx))^2}{c^4d}-\frac{x^3(a+b\arcsin(cx))^2}{3c^2d}\\&-\frac{22b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^5d}\\&-\frac{2bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d}\\&-\frac{2b^2\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{c^5d}\\&+\frac{2b^2\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{c^5d}+\frac{22b^2x}{9c^4d}+\frac{2b^2x^3}{27c^2d}\end{aligned}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] (22*b^2*x)/(9*c^4*d) + (2*b^2*x^3)/(27*c^2*d) - (22*b*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/(9*c^5*d) - (2*b*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
))/(9*c^3*d) - (x*(a + b*ArcSin[c*x])^2)/(c^4*d) - (x^3*(a + b*ArcSin[c*x])
^2)/(3*c^2*d) - ((2*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/(c^
5*d) + ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^
5*d) - ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5*d
) - (2*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(c^5*d) + (2*b^2*PolyLog[3,
I*E^(I*ArcSin[c*x])])/(c^5*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
```

```
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = -\frac{x^3(a+b\arcsin(cx))^2}{3c^2d}+\frac{\int \frac{x^2(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{c^2}+\frac{(2b)\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{3cd}$$

$$= -\frac{2bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d}-\frac{x(a+b\arcsin(cx))^2}{c^4d}-\frac{x^3(a+b\arcsin(cx))^2}{3c^2d}+\frac{\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{c^4}+\frac{(4b)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{9c^3d}+\frac{(2b)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{c^3d}+\frac{(2b^2)\int x^2\,dx}{9c^2d}$$

$$= \frac{2b^2x^3}{27c^2d}-\frac{22b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^5d}-\frac{2bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d}-\frac{x(a+b\arcsin(cx))^2}{c^4d}-\frac{x^3(a+b\arcsin(cx))^2}{3c^2d}+\frac{\text{Subst}\left(\int (a+bx)^2\sec(x)\,dx,x,\arcsin(cx)\right)}{c^5d}+\frac{(4b^2)\int 1\,dx}{9c^4d}+\frac{(2b^2)\int 1\,dx}{c^4d}$$

$$= \frac{22b^2x}{9c^4d}+\frac{2b^2x^3}{27c^2d}-\frac{22b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^5d}-\frac{2bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d}-\frac{x(a+b\arcsin(cx))^2}{c^4d}-\frac{x^3(a+b\arcsin(cx))^2}{3c^2d}-\frac{2i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d}-\frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^5d}+\frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^5d}$$

$$= \frac{22b^2x}{9c^4d}+\frac{2b^2x^3}{27c^2d}-\frac{22b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^5d}-\frac{2bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d}-\frac{x(a+b\arcsin(cx))^2}{c^4d}-\frac{x^3(a+b\arcsin(cx))^2}{3c^2d}-\frac{2i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d}+\frac{2ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^5d}-\frac{2ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^5d}-\frac{(2ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^5d}+\frac{(2ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^5d}$$

$$= \frac{22b^2x}{9c^4d} + \frac{2b^2x^3}{27c^2d} - \frac{22b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^5d} - \frac{2bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d} - \frac{x(a+b\arcsin(cx))^2}{c^4d} - \frac{x^3(a+b\arcsin(cx))^2}{3c^2d} - \frac{2i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d} + \frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^5d} - \frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^5d} - \frac{(2b^2)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^5d} + \frac{(2b^2)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^5d}$$

$$= \frac{22b^2x}{9c^4d} + \frac{2b^2x^3}{27c^2d} - \frac{22b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^5d} - \frac{2bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d} - \frac{x(a+b\arcsin(cx))^2}{c^4d} - \frac{x^3(a+b\arcsin(cx))^2}{3c^2d} - \frac{2i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d} + \frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^5d} - \frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^5d} - \frac{2b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{c^5d} + \frac{2b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{c^5d}$$

Mathematica [A] (verified)

Time = 1.01 (sec) , antiderivative size = 508, normalized size of antiderivative = 1.71

$$\int \frac{x^4(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = -\frac{108a^2cx - 270b^2cx + 36a^2c^3x^3 + 264ab\sqrt{1-c^2x^2} + 24abc^2x^2\sqrt{1-c^2x^2} + 108iab\pi\arcsin(cx) + 216abcx$$

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] -1/108*(108*a^2*c*x - 270*b^2*c*x + 36*a^2*c^3*x^3 + 264*a*b*Sqrt[1 - c^2*x
^2] + 24*a*b*c^2*x^2*Sqrt[1 - c^2*x^2] + (108*I)*a*b*Pi*ArcSin[c*x] + 216*a
*b*c*x*ArcSin[c*x] + 72*a*b*c^3*x^3*ArcSin[c*x] + 270*b^2*Sqrt[1 - c^2*x^2]
*ArcSin[c*x] + 135*b^2*c*x*ArcSin[c*x]^2 - 6*b^2*ArcSin[c*x]*Cos[3*ArcSin[c
```

```
*x]] - 108*a*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 216*a*b*ArcSin[c*x]*Log[1
- I*E^(I*ArcSin[c*x])] - 108*b^2*ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[c*x])]
 - 108*a*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 216*a*b*ArcSin[c*x]*Log[1 + I*
E^(I*ArcSin[c*x])] + 108*b^2*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] + 5
4*a^2*Log[1 - c*x] - 54*a^2*Log[1 + c*x] + 108*a*b*Pi*Log[-Cos[(Pi + 2*ArcS
in[c*x])/4]] + 108*a*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (216*I)*b*(a +
 b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (216*I)*b*(a + b*ArcSi
n[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])] + 216*b^2*PolyLog[3, (-I)*E^(I*ArcS
in[c*x])] - 216*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])] + 2*b^2*Sin[3*ArcSin[c*
x]] - 9*b^2*ArcSin[c*x]^2*Sin[3*ArcSin[c*x]])/(c^5*d)
```

Maple [F]

$$\int \frac{x^4 (a+b \arcsin (cx))^2}{-c^2 d\, x^2+d}dx$$

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

```
[Out] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

Fricas [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^4}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)/(c^2*d*
x^2 - d), x)
```

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = -\frac{\int \frac{a^2x^4}{c^2x^2-1}\,dx + \int \frac{b^2x^4\,\mathrm{asin}^2\,(cx)}{c^2x^2-1}\,dx + \int \frac{2abx^4\,\mathrm{asin}\,(cx)}{c^2x^2-1}\,dx}{d}$$

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2*x**4/(c**2*x**2 - 1), x) + Integral(b**2*x**4*asin(c*x)**2/
(c**2*x**2 - 1), x) + Integral(2*a*b*x**4*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Maxima [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^4}{c^2dx^2-d}\,dx$$

[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")

[Out] -1/6*a^2*(2*(c^2*x^3 + 3*x)/(c^4*d) - 3*log(c*x + 1)/(c^5*d) + 3*log(c*x - 1)/(c^5*d)) + 1/6*(6*c^5*d*integrate(-1/3*(6*a*b*c^4*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (3*b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 3*b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(b^2*c^3*x^3 + 3*b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d*x^2 - c^4*d), x) + 3*b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 3*b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*(b^2*c^3*x^3 + 3*b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/(c^5*d)

Giac [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^4}{c^2dx^2-d}\,dx$$

[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")

[Out] integrate(-(b*arcsin(c*x) + a)^2*x^4/(c^2*d*x^2 - d), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int \frac{x^4\,(a+b\,\mathrm{asin}(c\,x))^2}{d-c^2\,d\,x^2}\,dx$$

[In] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2),x)

[Out] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2), x)

3.184 $\int \frac{x^3(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 210

$$\int \frac{x^3(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \frac{b^2x^2}{4c^2d} - \frac{bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d} + \frac{(a+b\arcsin(cx))^2}{4c^4d} - \frac{x^2(a+b\arcsin(cx))^2}{2c^2d} + \frac{i(a+b\arcsin(cx))^3}{3bc^4d} - \frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d} + \frac{ib(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^4d} - \frac{b^2\,\mathrm{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2c^4d}$$

```
[Out] 1/4*b^2*x^2/c^2/d+1/4*(a+b*arcsin(c*x))^2/c^4/d-1/2*x^2*(a+b*arcsin(c*x))^2
/c^2/d+1/3*I*(a+b*arcsin(c*x))^3/b/c^4/d-(a+b*arcsin(c*x))^2*ln(1+(I*c*x+(-
c^2*x^2+1)^(1/2))^2)/c^4/d+I*b*(a+b*arcsin(c*x))*polylog(2,-(I*c*x+(-c^2*x^
2+1)^(1/2))^2)/c^4/d-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^4/d
-1/2*b*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3/d
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 210, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used

$= \{4795, 4765, 3800, 2221, 2611, 2320, 6724, 4737, 30\}$

$$\int \frac{x^3(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^4d} + \frac{i(a+b\arcsin(cx))^3}{3bc^4d} + \frac{(a+b\arcsin(cx))^2}{4c^4d} - \frac{\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{c^4d} - \frac{x^2(a+b\arcsin(cx))^2}{2c^2d} - \frac{bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d} - \frac{b^2\,\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2c^4d} + \frac{b^2x^2}{4c^2d}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] (b^2*x^2)/(4*c^2*d) - (b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c^3*d)
 + (a + b*ArcSin[c*x])^2/(4*c^4*d) - (x^2*(a + b*ArcSin[c*x])^2)/(2*c^2*d)
+ ((I/3)*(a + b*ArcSin[c*x])^3)/(b*c^4*d) - ((a + b*ArcSin[c*x])^2*Log[1 +
E^((2*I)*ArcSin[c*x])])/(c^4*d) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E^((
2*I)*ArcSin[c*x])])/(c^4*d) - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*c
^4*d)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
```

```
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = -\frac{x^2(a+b\arcsin(cx))^2}{2c^2d} + \frac{\int \frac{x(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{c^2} + \frac{b\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{cd}$$

$$= -\frac{bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d} - \frac{x^2(a+b\arcsin(cx))^2}{2c^2d} + \frac{\text{Subst}\left(\int (a+bx)^2\tan(x)\,dx, x, \arcsin(cx)\right)}{c^4d} + \frac{b\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2c^3d} + \frac{b^2\int x\,dx}{2c^2d}$$

$$= \frac{b^2x^2}{4c^2d} - \frac{bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d} + \frac{(a+b\arcsin(cx))^2}{4c^4d} - \frac{x^2(a+b\arcsin(cx))^2}{2c^2d} + \frac{i(a+b\arcsin(cx))^3}{3bc^4d} - \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)^2}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{c^4d}$$

$$= \frac{b^2x^2}{4c^2d} - \frac{bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d} + \frac{(a+b\arcsin(cx))^2}{4c^4d} - \frac{x^2(a+b\arcsin(cx))^2}{2c^2d} + \frac{i(a+b\arcsin(cx))^3}{3bc^4d} - \frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d} + \frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{c^4d}$$

$$= \frac{b^2x^2}{4c^2d} - \frac{bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d} + \frac{(a+b\arcsin(cx))^2}{4c^4d} - \frac{x^2(a+b\arcsin(cx))^2}{2c^2d} + \frac{i(a+b\arcsin(cx))^3}{3bc^4d} - \frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d} + \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^4d} - \frac{(ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{c^4d}$$

$$= \frac{b^2x^2}{4c^2d} - \frac{bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d} + \frac{(a+b\arcsin(cx))^2}{4c^4d} - \frac{x^2(a+b\arcsin(cx))^2}{2c^2d} + \frac{i(a+b\arcsin(cx))^3}{3bc^4d} - \frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d} + \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^4d} - \frac{b^2\text{Subst}\left(\int \frac{\text{PolyLog}(2,-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2c^4d}$$

$$= \frac{b^2x^2}{4c^2d} - \frac{bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d} + \frac{(a+b\arcsin(cx))^2}{4c^4d} - \frac{x^2(a+b\arcsin(cx))^2}{2c^2d} + \frac{i(a+b\arcsin(cx))^3}{3bc^4d} - \frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d} + \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^4d} - \frac{b^2\,\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2c^4d}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 459 vs. 2(210) = 420.

Time = 0.60 (sec) , antiderivative size = 459, normalized size of antiderivative = 2.19

$$\int \frac{x^3(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx =$$
$$-\frac{12a^2c^2x^2+12abcx\sqrt{1-c^2x^2}+48iab\pi\arcsin(cx)+24abc^2x^2\arcsin(cx)-24iab\arcsin(cx)^2-8ib^2\arcs}{}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] -1/24*(12*a^2*c^2*x^2 + 12*a*b*c*x*Sqrt[1 - c^2*x^2] + (48*I)*a*b*Pi*ArcSin
[c*x] + 24*a*b*c^2*x^2*ArcSin[c*x] - (24*I)*a*b*ArcSin[c*x]^2 - (8*I)*b^2*A
rcSin[c*x]^3 - 24*a*b*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])] + 3*b^2*Cos[2*
ArcSin[c*x]] - 6*b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] + 96*a*b*Pi*Log[1 + E
^((-I)*ArcSin[c*x])] + 24*a*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 48*a*b*ArcS
in[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 24*a*b*Pi*Log[1 + I*E^(I*ArcSin[c*x]
)] + 48*a*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 24*b^2*ArcSin[c*x]^2
*Log[1 + E^((2*I)*ArcSin[c*x])] + 12*a^2*Log[1 - c^2*x^2] - 96*a*b*Pi*Log[C
os[ArcSin[c*x]/2]] + 24*a*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 24*a*b*P
i*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (48*I)*a*b*PolyLog[2, (-I)*E^(I*ArcSin
[c*x])] - (48*I)*a*b*PolyLog[2, I*E^(I*ArcSin[c*x])] - (24*I)*b^2*ArcSin[c*
x]*PolyLog[2, -E^((2*I)*ArcSin[c*x])] + 12*b^2*PolyLog[3, -E^((2*I)*ArcSin[
c*x])] + 6*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])/(c^4*d)
```

Maple [A] (verified)

Time = 0.42 (sec) , antiderivative size = 371, normalized size of antiderivative = 1.77

method	result
derivativedivides	$-\frac{a^2\left(\frac{c^2x^2}{2}+\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}+\frac{ib^2\arcsin(cx)^3}{3d}-\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx}{2d}-\frac{b^2\arcsin(cx)^2c^2x^2}{2d}+\frac{b^2\arcsin(cx)^2}{4d}+\frac{b^2c^2x^2}{4d}$
default	$-\frac{a^2\left(\frac{c^2x^2}{2}+\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}+\frac{ib^2\arcsin(cx)^3}{3d}-\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx}{2d}-\frac{b^2\arcsin(cx)^2c^2x^2}{2d}+\frac{b^2\arcsin(cx)^2}{4d}+\frac{b^2c^2x^2}{4d}$
parts	$-\frac{a^2x^2}{2d\,c^2}-\frac{a^2\ln(c^2x^2-1)}{2d\,c^4}+\frac{iab\,\mathrm{polylog}\left(2,-\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)}{d\,c^4}-\frac{b^2\arcsin(cx)\sqrt{-c^2x^2+1}\,x}{2d\,c^3}-\frac{b^2\arcsin(cx)^2}{2d\,c^2}$

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(-a^2/d*(1/2*c^2*x^2+1/2*ln(c*x-1)+1/2*ln(c*x+1))+1/3*I*b^2/d*arcsin(
c*x)^3-1/2*b^2/d*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x-1/2*b^2/d*arcsin(c*x)^2
```

```
*c^2*x^2+1/4*b^2/d*arcsin(c*x)^2+1/4*b^2/d*c^2*x^2-1/8*b^2/d-b^2/d*arcsin(c
*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*a*b/d*arcsin(c*x)^2-1/2*b^2*poly
log(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d+I*a*b/d*polylog(2,-(I*c*x+(-c^2*x^2+
1)^(1/2))^2)-1/2*a*b/d*(-c^2*x^2+1)^(1/2)*c*x-a*b/d*arcsin(c*x)*c^2*x^2+1/2
*a*b/d*arcsin(c*x)-2*a*b/d*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I
*b^2/d*arcsin(c*x)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2))
```

Fricas [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^3}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3)/(c^2*d*
x^2 - d), x)
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = -\frac{\int \frac{a^2x^3}{c^2x^2-1}\,dx + \int \frac{b^2x^3\operatorname{asin}^2(cx)}{c^2x^2-1}\,dx + \int \frac{2abx^3\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2*x**3/(c**2*x**2 - 1), x) + Integral(b**2*x**3*asin(c*x)**2/
(c**2*x**2 - 1), x) + Integral(2*a*b*x**3*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Maxima [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^3}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(x^2/(c^2*d) + log(c^2*x^2 - 1)/(c^4*d)) - 1/2*(b^2*c^2*x^2*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*c^4*d*integrate((2*a*b*c^3*x^3*a
rctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (b^2*c^2*x^2*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)) + b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*l
og(c*x + 1) + b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))
*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^5*d*x^2 - c^3*d), x) + b^2*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) + b^2*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))^2*log(-c*x + 1))/(c^4*d)
```

Giac [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin{(cx)}+a)^2x^3}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^3/(c^2*d*x^2 - d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int \frac{x^3\,(a+b\,\mathrm{asin}(c\,x))^2}{d-c^2\,d\,x^2}\,dx$$

```
[In] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2),x)
[Out] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2), x)
```

3.185 $\int \frac{x^2(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 218

$$\begin{aligned}\int \frac{x^2(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx=&\frac{2b^2x}{c^2d}-\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d}-\frac{x(a+b\arcsin(cx))^2}{c^2d}\\&-\frac{2i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d}\\&+\frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^3d}\\&-\frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^3d}\\&-\frac{2b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{c^3d}+\frac{2b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{c^3d}\end{aligned}$$

```
[Out] 2*b^2*x/c^2/d-x*(a+b*arcsin(c*x))^2/c^2/d-2*I*(a+b*arcsin(c*x))^2*arctan(I*
c*x+(-c^2*x^2+1)^(1/2))/c^3/d+2*I*b*(a+b*arcsin(c*x))*polylog(2,-I*(I*c*x+(
-c^2*x^2+1)^(1/2)))/c^3/d-2*I*b*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*
x^2+1)^(1/2)))/c^3/d-2*b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d+2
*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d-2*b*(a+b*arcsin(c*x))*(-
c^2*x^2+1)^(1/2)/c^3/d
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4795, 4749, 4266, 2611, 2320, 6724, 4767, 8}

$$\begin{aligned}\int \frac{x^2(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = &-\frac{2i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{c^3d}\\&+\frac{2ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^3d}\\&-\frac{2ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^3d}\\&-\frac{x(a+b\arcsin(cx))^2}{c^2d}-\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d}\\&-\frac{2b^2\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{c^3d}\\&+\frac{2b^2\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{c^3d}+\frac{2b^2x}{c^2d}\end{aligned}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] (2*b^2*x)/(c^2*d) - (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c^3*d) - (
x*(a + b*ArcSin[c*x])^2)/(c^2*d) - ((2*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I
*ArcSin[c*x])])/(c^3*d) + ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])])/(c^3*d) - ((2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(c^3*d) - (2*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(c^3*d) +
 (2*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c^3*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
```

```
f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = -\frac{x(a+b\arcsin(cx))^2}{c^2d} + \frac{\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{c^2} + \frac{(2b)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{cd}$$

$$= -\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d} - \frac{x(a+b\arcsin(cx))^2}{c^2d} + \frac{\text{Subst}\left(\int (a+bx)^2\sec(x)\,dx, x, \arcsin(cx)\right)}{c^3d} + \frac{(2b^2)\int 1\,dx}{c^2d}$$

$$= \frac{2b^2x}{c^2d} - \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d} - \frac{x(a+b\arcsin(cx))^2}{c^2d} - \frac{2i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d} - \frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^3d} + \frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^3d}$$

$$= \frac{2b^2x}{c^2d} - \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d} - \frac{x(a+b\arcsin(cx))^2}{c^2d} - \frac{2i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d} + \frac{2ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^3d} - \frac{2ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^3d} - \frac{(2ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^3d} + \frac{(2ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^3d}$$

$$= \frac{2b^2x}{c^2d} - \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d} - \frac{x(a+b\arcsin(cx))^2}{c^2d} - \frac{2i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d} + \frac{2ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^3d} - \frac{2ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^3d} - \frac{(2b^2)\,\text{Subst}\left(\int \frac{\text{PolyLog}(2,-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{c^3d} + \frac{(2b^2)\,\text{Subst}\left(\int \frac{\text{PolyLog}(2,ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{c^3d}$$

$$= \frac{2b^2x}{c^2d} - \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d} - \frac{x(a+b\arcsin(cx))^2}{c^2d} - \frac{2i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d} + \frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^3d} - \frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^3d} - \frac{2b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{c^3d} + \frac{2b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{c^3d}$$

Mathematica [A] (verified)

Time = 1.07 (sec) , antiderivative size = 412, normalized size of antiderivative = 1.89

$$\int \frac{x^2(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = -\frac{2a^2cx - 4b^2cx + 4ab\sqrt{1-c^2x^2} + 2iab\pi\arcsin(cx) + 4abcx\arcsin(cx) + 4b^2\sqrt{1-c^2x^2}\arcsin(cx) + 2b^2c}{}$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] -1/2*(2*a^2*c*x - 4*b^2*c*x + 4*a*b*Sqrt[1 - c^2*x^2] + (2*I)*a*b*Pi*ArcSin
[c*x] + 4*a*b*c*x*ArcSin[c*x] + 4*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + 2*b^2
*c*x*ArcSin[c*x]^2 - 2*a*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 4*a*b*ArcSin[c
*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b^2*ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSi
n[c*x])] - 2*a*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 4*a*b*ArcSin[c*x]*Log[1
+ I*E^(I*ArcSin[c*x])] + 2*b^2*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] +
 a^2*Log[1 - c*x] - a^2*Log[1 + c*x] + 2*a*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x
])/4]] + 2*a*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (4*I)*b*(a + b*ArcSin[
c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (4*I)*b*(a + b*ArcSin[c*x])*Poly
Log[2, I*E^(I*ArcSin[c*x])] + 4*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] - 4*
b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c^3*d)
```

Maple [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{-c^2d\,x^2+d}dx$$

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

```
[Out] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^2}{c^2dx^2-d}\,dx$$

[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")

[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)/(c^2*d*x^2 - d), x)

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = -\frac{\int \frac{a^2x^2}{c^2x^2-1}\,dx + \int \frac{b^2x^2\operatorname{asin}^2(cx)}{c^2x^2-1}\,dx + \int \frac{2abx^2\operatorname{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)

[Out] -(Integral(a**2*x**2/(c**2*x**2 - 1), x) + Integral(b**2*x**2*asin(c*x)**2/(c**2*x**2 - 1), x) + Integral(2*a*b*x**2*asin(c*x)/(c**2*x**2 - 1), x))/d

Maxima [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^2}{c^2dx^2-d}\,dx$$

[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")

[Out] -1/2*a^2*(2*x/(c^2*d) - log(c*x + 1)/(c^3*d) + log(c*x - 1)/(c^3*d)) - 1/2*(2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 - 2*c^3*d*integrate(-(2*a*b*c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) + b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d*x^2 - c^2*d), x) - b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) + b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1))/(c^3*d)

Giac [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin{(cx)}+a)^2x^2}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^2/(c^2*d*x^2 - d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))^2}{d-c^2\,d\,x^2}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2),x)
[Out] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2), x)
```

3.186 $\int \frac{x(a+b\arcsin(cx))^2}{d-c^2dx^2} dx$

Optimal result

Integrand size = 25, antiderivative size = 117

$$\int \frac{x(a+b\arcsin(cx))^2}{d-c^2dx^2} dx = \frac{i(a+b\arcsin(cx))^3}{3bc^2d} - \frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^2d} + \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^2d} - \frac{b^2\,\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2c^2d}$$

```
[Out] 1/3*I*(a+b*arcsin(c*x))^3/b/c^2/d-(a+b*arcsin(c*x))^2*ln(1+(I*c*x+(-c^2*x^2
+1)^(1/2))^2)/c^2/d+I*b*(a+b*arcsin(c*x))*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1
/2))^2)/c^2/d-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^2/d
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4765, 3800, 2221, 2611, 2320, 6724}

$$\int \frac{x(a+b\arcsin(cx))^2}{d-c^2dx^2} dx = \frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^2d} + \frac{i(a+b\arcsin(cx))^3}{3bc^2d} - \frac{\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{c^2d} - \frac{b^2\,\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2c^2d}$$

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] ((I/3)*(a + b*ArcSin[c*x])^3)/(b*c^2*d) - ((a + b*ArcSin[c*x])^2*Log[1 + E^
((2*I)*ArcSin[c*x])])/(c^2*d) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E^((2*
I)*ArcSin[c*x])])/(c^2*d) - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*c^2
*d)
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (a+bx)^2\tan(x)\,dx,x,\arcsin(cx)\right)}{c^2d}\\
&= \frac{i(a+b\arcsin(cx))^3}{3bc^2d}-\frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)^2}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{c^2d}\\
&= \frac{i(a+b\arcsin(cx))^3}{3bc^2d}-\frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^2d}\\
&\quad+\frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{c^2d}\\
&= \frac{i(a+b\arcsin(cx))^3}{3bc^2d}-\frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^2d}\\
&\quad+\frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^2d}\\
&\quad-\frac{(ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{c^2d}\\
&= \frac{i(a+b\arcsin(cx))^3}{3bc^2d}-\frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^2d}\\
&\quad+\frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^2d}\\
&\quad-\frac{b^2\text{Subst}\left(\int \frac{\text{PolyLog}(2,-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{2c^2d}\\
&= \frac{i(a+b\arcsin(cx))^3}{3bc^2d}-\frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^2d}\\
&\quad+\frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^2d}-\frac{b^2\,\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2c^2d}
\end{aligned}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 342 vs. 2(117) = 234.

Time = 0.66 (sec) , antiderivative size = 342, normalized size of antiderivative = 2.92

$$\int \frac{x(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx$$
$$= \frac{-12iab\pi\arcsin(cx)+6iab\arcsin(cx)^2+2ib^2\arcsin(cx)^3-24ab\pi\log\left(1+e^{-i\arcsin(cx)}\right)-6ab\pi\log\left(1-ie\right.}{}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] ((-12*I)*a*b*Pi*ArcSin[c*x] + (6*I)*a*b*ArcSin[c*x]^2 + (2*I)*b^2*ArcSin[c*
x]^3 - 24*a*b*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 6*a*b*Pi*Log[1 - I*E^(I*Ar
cSin[c*x])] - 12*a*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 6*a*b*Pi*Lo
g[1 + I*E^(I*ArcSin[c*x])] - 12*a*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])
] - 6*b^2*ArcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x])] - 3*a^2*Log[1 - c^2*
x^2] + 24*a*b*Pi*Log[Cos[ArcSin[c*x]/2]] - 6*a*b*Pi*Log[-Cos[(Pi + 2*ArcSin
[c*x])/4]] + 6*a*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (12*I)*a*b*PolyLog
[2, (-I)*E^(I*ArcSin[c*x])] + (12*I)*a*b*PolyLog[2, I*E^(I*ArcSin[c*x])] +
(6*I)*b^2*ArcSin[c*x]*PolyLog[2, -E^((2*I)*ArcSin[c*x])] - 3*b^2*PolyLog[3,
 -E^((2*I)*ArcSin[c*x])])/(6*c^2*d)
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.76

method	result
parts	$-\frac{a^2\ln\left(c^2x^2-1\right)}{2d\,c^2}-\frac{b^2\left(-\frac{i\arcsin(cx)^3}{3}+\arcsin(cx)^2\ln\left(1+\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)-i\arcsin(cx)\operatorname{polylog}\left(2,-\left(icx+\sqrt{-c^2}\right.\right.\right.}{d\,c^2}$
derivativedivides	$\frac{-\frac{a^2\left(\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b^2\left(-\frac{i\arcsin(cx)^3}{3}+\arcsin(cx)^2\ln\left(1+\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)-i\arcsin(cx)\operatorname{polylog}\left(2,-\left(icx+\sqrt{-c^2x^2+}\right.\right.\right.}{d}}{}$
default	$\frac{-\frac{a^2\left(\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b^2\left(-\frac{i\arcsin(cx)^3}{3}+\arcsin(cx)^2\ln\left(1+\left(icx+\sqrt{-c^2x^2+1}\right)^2\right)-i\arcsin(cx)\operatorname{polylog}\left(2,-\left(icx+\sqrt{-c^2x^2+}\right.\right.\right.}{d}}{}$

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a^2/d/c^2*ln(c^2*x^2-1)-b^2/d/c^2*(-1/3*I*arcsin(c*x)^3+arcsin(c*x)^2*
ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-I*arcsin(c*x)*polylog(2,-(I*c*x+(-c^2*x^
2+1)^(1/2))^2)+1/2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2))-2*a*b/d/c^2*(-
1/2*I*arcsin(c*x)^2+arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*I*po
lylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2))
```

Fricas [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x}{c^2dx^2-d}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) + a^2*x)/(c^2*d*x^2 -
d), x)
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = -\frac{\int \frac{a^2x}{c^2x^2-1}\,dx + \int \frac{b^2x\,\mathrm{asin}^2(cx)}{c^2x^2-1}\,dx + \int \frac{2abx\,\mathrm{asin}(cx)}{c^2x^2-1}\,dx}{d}$$

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
```

```
[Out] -(Integral(a**2*x/(c**2*x**2 - 1), x) + Integral(b**2*x*asin(c*x)**2/(c**2*
x**2 - 1), x) + Integral(2*a*b*x*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Maxima [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x}{c^2dx^2-d}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a^2*log(c^2*d*x^2 - d)/(c^2*d) - 1/2*(b^2*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1))^2*log(c*x + 1) + b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
1))^2*log(-c*x + 1) + 2*c^2*d*integrate((2*a*b*c*x*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)) + (b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*
x + 1) + b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*sqrt
(c*x + 1)*sqrt(-c*x + 1))/(c^3*d*x^2 - c*d), x))/(c^2*d)
```

Giac [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x}{c^2dx^2-d}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2*x/(c^2*d*x^2 - d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int \frac{x\,(a+b\,\mathrm{asin}(c\,x))^2}{d-c^2\,d\,x^2}\,dx$$

```
[In] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2),x)
[Out] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2), x)
```

3.187 $\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 156

$$\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = -\frac{2i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{cd} + \frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{cd} - \frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{cd} - \frac{2b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{cd} + \frac{2b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{cd}$$

```
[Out] -2*I*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/d+2*I*b*(a+b*ar
csin(c*x))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d-2*I*b*(a+b*arcsin(c
*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d-2*b^2*polylog(3,-I*(I*c*x+
(-c^2*x^2+1)^(1/2)))/c/d+2*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used

$= \{4749, 4266, 2611, 2320, 6724\}$

$$\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = -\frac{2i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{cd} + \frac{2ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{cd} - \frac{2ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{cd} - \frac{2b^2\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{cd} + \frac{2b^2\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{cd}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2),x]
```

```
[Out] ((-2*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/(c*d) + ((2*I)*b*(
a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d) - ((2*I)*b*(a
+ b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d) - (2*b^2*PolyLog[3,
 (-I)*E^(I*ArcSin[c*x])])/(c*d) + (2*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(
c*d)
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
```

```
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int (a+bx)^2 \sec(x)\,dx, x, \arcsin(cx)\right)}{cd}$$

$$= -\frac{2i(a+b\arcsin(cx))^2 \arctan\left(e^{i\arcsin(cx)}\right)}{cd} - \frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{cd} + \frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{cd}$$

$$= -\frac{2i(a+b\arcsin(cx))^2 \arctan\left(e^{i\arcsin(cx)}\right)}{cd} + \frac{2ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{cd} - \frac{2ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{cd} - \frac{(2ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{cd} + \frac{(2ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{cd}$$

$$= -\frac{2i(a+b\arcsin(cx))^2 \arctan\left(e^{i\arcsin(cx)}\right)}{cd} + \frac{2ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{cd} - \frac{2ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{cd} - \frac{(2b^2)\,\text{Subst}\left(\int \frac{\text{PolyLog}(2,-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{cd} + \frac{(2b^2)\,\text{Subst}\left(\int \frac{\text{PolyLog}(2,ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{cd}$$

$$= -\frac{2i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{cd} + \frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{cd} - \frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{cd} - \frac{2b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{cd} + \frac{2b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{cd}$$

Mathematica [A] (verified)

Time = 0.70 (sec) , antiderivative size = 302, normalized size of antiderivative = 1.94

$$\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = -\frac{2iab\pi\arcsin(cx)+4ib^2\arcsin(cx)^2\arctan\left(e^{i\arcsin(cx)}\right)-2ab\pi\log\left(1-ie^{i\arcsin(cx)}\right)-4ab\arcsin(cx)\log\left(\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2),x]
```

```
[Out] -1/2*((2*I)*a*b*Pi*ArcSin[c*x] + (4*I)*b^2*ArcSin[c*x]^2*ArcTan[E^(I*ArcSin
[c*x])] - 2*a*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 4*a*b*ArcSin[c*x]*Log[1 -
 I*E^(I*ArcSin[c*x])] - 2*a*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 4*a*b*ArcSi
n[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + a^2*Log[1 - c*x] - a^2*Log[1 + c*x] +
 2*a*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 2*a*b*Pi*Log[Sin[(Pi + 2*ArcS
in[c*x])/4]] - (4*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)] + (4*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])] + 4*b^2*Po
lyLog[3, (-I)*E^(I*ArcSin[c*x])] - 4*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(
c*d)
```

Maple [A] (verified)

Time = 0.24 (sec) , antiderivative size = 375, normalized size of antiderivative = 2.40

method	result
derivativedivides	$-\frac{b^2\arcsin(cx)^2\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}+\frac{2ib^2\arcsin(cx)\operatorname{polylog}\left(2,-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}-\frac{2b^2\operatorname{polylog}\left(3,-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}$
default	$-\frac{b^2\arcsin(cx)^2\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}+\frac{2ib^2\arcsin(cx)\operatorname{polylog}\left(2,-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}-\frac{2b^2\operatorname{polylog}\left(3,-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)}{d}$

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-1/d*b^2*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I/d*b^2*ar
csin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2/d*b^2*polylog(3,-I*(I*
c*x+(-c^2*x^2+1)^(1/2)))+1/d*b^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(
```

```
1/2)))-2*I/d*b^2*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2/d*b^
2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*a*b/d*arcsin(c*x)*ln(1+I*(I*c*x
+(-c^2*x^2+1)^(1/2)))+2*I/d*a*b*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*
a*b/d*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I/d*a*b*polylog(2,I*
(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I/d*a^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin{(cx)}+a)^2}{c^2dx^2-d}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^2 - d), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = -\frac{\int \frac{a^2}{c^2x^2-1}\,dx + \int \frac{b^2\operatorname{asin}^2{(cx)}}{c^2x^2-1}\,dx + \int \frac{2ab\operatorname{asin}{(cx)}}{c^2x^2-1}\,dx}{d}$$

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
[Out] -(Integral(a**2/(c**2*x**2 - 1), x) + Integral(b**2*asin(c*x)**2/(c**2*x**2
 - 1), x) + Integral(2*a*b*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin{(cx)}+a)^2}{c^2dx^2-d}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
[Out] 1/2*a^2*(log(c*x + 1)/(c*d) - log(c*x - 1)/(c*d)) + 1/2*(b^2*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - b^2*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))^2*log(-c*x + 1) + 2*c*d*integrate(-(2*a*b*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)) - (b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))*log(c*x + 1) - b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x +
 1))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d*x^2 - d), x))/(c*d)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int -\frac{(b\arcsin(cx)+a)^2}{c^2dx^2-d}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2/(c^2*d*x^2 - d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{d-c^2\,d\,x^2}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(d - c^2*d*x^2),x)
[Out] int((a + b*asin(c*x))^2/(d - c^2*d*x^2), x)
```

3.188 $\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 131

$$\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)}\,dx = -\frac{2(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d} + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d} - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d} - \frac{b^2\operatorname{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d} + \frac{b^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d}$$

```
[Out] -2*(a+b*arcsin(c*x))^2*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/d+I*b*(a+b*arc
sin(c*x))*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-I*b*(a+b*arcsin(c*x))*
polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x
^2+1)^(1/2))^2)/d+1/2*b^2*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used

$= \{4769, 4504, 4268, 2611, 2320, 6724\}$

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(d-c^2dx^2)}\,dx = -\frac{2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{d} + \frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d} - \frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d} - \frac{b^2\,\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d} + \frac{b^2\,\text{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)),x]
```

```
[Out] (-2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d + (I*b*(a + b*A
rcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d - (I*b*(a + b*ArcSin[c*x]
)*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c
*x])])/(2*d) + (b^2*PolyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d)
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
```

```
x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int (a+bx)^2\csc(x)\sec(x)\,dx,x,\arcsin(cx)\right)}{d}\\
&= \frac{2\text{Subst}\left(\int (a+bx)^2\csc(2x)\,dx,x,\arcsin(cx)\right)}{d}\\
&= -\frac{2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d}\\
&\quad-\frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d}\\
&\quad+\frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d}\\
&= -\frac{2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d}\\
&\quad+\frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d}\\
&\quad-\frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d}\\
&\quad-\frac{(ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d}\\
&\quad+\frac{(ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d}
\end{aligned}
$$

$$= -\frac{2(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d} + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d} - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d} - \frac{b^2\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{2d} + \frac{b^2\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{2d}$$

$$= -\frac{2(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d} + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d} - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d} - \frac{b^2\operatorname{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d} + \frac{b^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 453 vs. $2(131) = 262$.

Time = 0.48 (sec) , antiderivative size = 453, normalized size of antiderivative = 3.46

$$\int\frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)}\,dx = \frac{-ib^2\pi^3 - 48iab\pi\arcsin(cx) + 16ib^2\arcsin(cx)^3 - 96ab\pi\log\left(1+e^{-i\arcsin(cx)}\right) - 24ab\pi\log\left(1-ie^{i\arcsin(cx)}\right)}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)),x]
```

```
[Out] ((-I)*b^2*Pi^3 - (48*I)*a*b*Pi*ArcSin[c*x] + (16*I)*b^2*ArcSin[c*x]^3 - 96*
a*b*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 24*a*b*Pi*Log[1 - I*E^(I*ArcSin[c*x]
)] - 48*a*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 24*a*b*Pi*Log[1 + I*
E^(I*ArcSin[c*x])] - 48*a*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 24*b
^2*ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] + 48*a*b*ArcSin[c*x]*Log[1
 - E^((2*I)*ArcSin[c*x])] - 24*b^2*ArcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*
x])] + 24*a^2*Log[c*x] - 12*a^2*Log[1 - c^2*x^2] + 96*a*b*Pi*Log[Cos[ArcSin
[c*x]/2]] - 24*a*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 24*a*b*Pi*Log[Sin
[(Pi + 2*ArcSin[c*x])/4]] + (48*I)*a*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] +
 (48*I)*a*b*PolyLog[2, I*E^(I*ArcSin[c*x])] + (24*I)*b^2*ArcSin[c*x]*PolyLo
```

```
g[2, E^((-2*I)*ArcSin[c*x])] + (24*I)*b^2*ArcSin[c*x]*PolyLog[2, -E^((2*I)*
ArcSin[c*x])] - (24*I)*a*b*PolyLog[2, E^((2*I)*ArcSin[c*x])] + 12*b^2*PolyL
og[3, E^((-2*I)*ArcSin[c*x])] - 12*b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/
(24*d)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 451 vs. $2(175) = 350$.

Time = 0.20 (sec) , antiderivative size = 452, normalized size of antiderivative = 3.45

method	result
parts	$-\frac{a^2\left(-\ln(x)+\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b^2\left(-\arcsin(cx)^2\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+2i\arcsin(cx)\operatorname{polylog}\left(2,-icx-\sqrt{-\right.\right.}}{}$
derivativedivides	$-\frac{a^2\left(-\ln(cx)+\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b^2\left(-\arcsin(cx)^2\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+2i\arcsin(cx)\operatorname{polylog}\left(2,-icx-\sqrt{\right.\right.}}{}$
default	$-\frac{a^2\left(-\ln(cx)+\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b^2\left(-\arcsin(cx)^2\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+2i\arcsin(cx)\operatorname{polylog}\left(2,-icx-\sqrt{\right.\right.}}{}$

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] -a^2/d*(-ln(x)+1/2*ln(c*x-1)+1/2*ln(c*x+1))-b^2/d*(-arcsin(c*x)^2*ln(1+I*c*
x+(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-
2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+arcsin(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+
1)^(1/2))^2)-I*arcsin(c*x)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*pol
ylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)
^(1/2))+2*I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-2*polylog(3,I*c
*x+(-c^2*x^2+1)^(1/2)))-2*a*b/d*(-arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2)
)+I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+
1)^(1/2))^2)-1/2*I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-arcsin(c*x)*ln(
1-I*c*x-(-c^2*x^2+1)^(1/2))+I*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)}\,dx=\int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^3 - d*x),
x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(d-c^2dx^2)}\,dx = -\frac{\int \frac{a^2}{c^2x^3-x}\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{c^2x^3-x}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{c^2x^3-x}\,dx}{d}$$

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d),x)
[Out] -(Integral(a**2/(c**2*x**3 - x), x) + Integral(b**2*asin(c*x)**2/(c**2*x**3
 - x), x) + Integral(2*a*b*asin(c*x)/(c**2*x**3 - x), x))/d
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(d-c^2dx^2)}\,dx = \int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d),x, algorithm="maxima")
[Out] -1/2*a^2*(log(c*x + 1)/d + log(c*x - 1)/d - 2*log(x)/d) - integrate((b^2*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)))/(c^2*d*x^3 - d*x), x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(d-c^2dx^2)}\,dx = \int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(d-c^2dx^2)}\,dx = \int \frac{(a+b\operatorname{asin}(c\,x))^2}{x\,(d-c^2\,d\,x^2)}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)),x)
[Out] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)), x)
```

3.189 $\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 238

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)}\,dx =& -\frac{(a+b\arcsin(cx))^2}{dx} - \frac{2ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d} \\ &- \frac{4bc(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d} \\ &+ \frac{2ib^2c\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d} \\ &+ \frac{2ibc(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d} \\ &- \frac{2ibc(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d} \\ &- \frac{2ib^2c\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d} - \frac{2b^2c\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{d} \\ &+ \frac{2b^2c\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{d}\end{aligned}$$

```
[Out] -(a+b*arcsin(c*x))^2/d/x-2*I*c*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1
)^(1/2))/d-4*b*c*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))/d+2*I*
b^2*c*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))/d+2*I*b*c*(a+b*arcsin(c*x))*poly
log(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d-2*I*b*c*(a+b*arcsin(c*x))*polylog(2,
I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d-2*I*b^2*c*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2
))/d-2*b^2*c*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d+2*b^2*c*polylog(3,I
*(I*c*x+(-c^2*x^2+1)^(1/2)))/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.370, Rules used = {4789, 4749, 4266, 2611, 2320, 6724, 4803, 4268, 2317, 2438}

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)}\,dx = -\frac{2ic\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{d} - \frac{4bc\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d} + \frac{2ibc\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d} - \frac{2ibc\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d} - \frac{(a+b\arcsin(cx))^2}{dx} + \frac{2ib^2c\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d} - \frac{2ib^2c\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d} - \frac{2b^2c\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{d} + \frac{2b^2c\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{d}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])^2/(d*x)) - ((2*I)*c*(a + b*ArcSin[c*x])^2*ArcTan[E^(I
*ArcSin[c*x])])/d - (4*b*c*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/
d + ((2*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])])/d + ((2*I)*b*c*(a + b*ArcS
in[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d - ((2*I)*b*c*(a + b*ArcSin[c
*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d - ((2*I)*b^2*c*PolyLog[2, E^(I*ArcS
in[c*x])])/d - (2*b^2*c*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/d + (2*b^2*c*Po
lyLog[3, I*E^(I*ArcSin[c*x])])/d
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
```

```
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{(a+b\arcsin(cx))^2}{dx}+c^2\int\frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx+\frac{(2bc)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{d}\\
&= -\frac{(a+b\arcsin(cx))^2}{dx}+\frac{c\text{Subst}\left(\int(a+bx)^2\sec(x)\,dx,x,\arcsin(cx)\right)}{d}\\
&\quad+\frac{(2bc)\text{Subst}\left(\int(a+bx)\csc(x)\,dx,x,\arcsin(cx)\right)}{d}\\
&= -\frac{(a+b\arcsin(cx))^2}{dx}-\frac{2ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d}\\
&\quad-\frac{4bc(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d}\\
&\quad-\frac{(2bc)\text{Subst}\left(\int(a+bx)\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d}\\
&\quad+\frac{(2bc)\text{Subst}\left(\int(a+bx)\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d}\\
&\quad-\frac{\left(2b^2c\right)\text{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d}\\
&\quad+\frac{\left(2b^2c\right)\text{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d}
\end{aligned}
$$

$$= -\frac{(a+b\arcsin(cx))^2}{dx} - \frac{2ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d} - \frac{4bc(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d} + \frac{2ibc(a+b\arcsin(cx))\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d} - \frac{2ibc(a+b\arcsin(cx))\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d} + \frac{(2ib^2c)\,\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d} - \frac{(2ib^2c)\,\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d} - \frac{(2ib^2c)\,\text{Subst}\left(\int\text{PolyLog}\left(2,-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d} + \frac{(2ib^2c)\,\text{Subst}\left(\int\text{PolyLog}\left(2,ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d}$$

$$= -\frac{(a+b\arcsin(cx))^2}{dx} - \frac{2ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d} - \frac{4bc(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d} + \frac{2ib^2c\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d} + \frac{2ibc(a+b\arcsin(cx))\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d} - \frac{2ibc(a+b\arcsin(cx))\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d} - \frac{2ib^2c\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d} - \frac{(2b^2c)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d} + \frac{(2b^2c)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d}$$

$$= -\frac{(a+b\arcsin(cx))^2}{dx} - \frac{2ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d} - \frac{4bc(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d} + \frac{2ib^2c\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d} + \frac{2ibc(a+b\arcsin(cx))\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d} - \frac{2ibc(a+b\arcsin(cx))\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d} - \frac{2ib^2c\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d} - \frac{2b^2c\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{d} + \frac{2b^2c\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{d}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 525 vs. 2(238) = 476.

Time = 1.17 (sec) , antiderivative size = 525, normalized size of antiderivative = 2.21

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)}\,dx = -\frac{2a^2+4ab\arcsin(cx)+2iabc\pi x\arcsin(cx)+2b^2\arcsin(cx)^2+4abcx\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)-4b^2cx\arcsin(}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)),x]
```

```
[Out] -1/2*(2*a^2 + 4*a*b*ArcSin[c*x] + (2*I)*a*b*c*Pi*x*ArcSin[c*x] + 2*b^2*ArcS
in[c*x]^2 + 4*a*b*c*x*ArcTanh[Sqrt[1 - c^2*x^2]] - 4*b^2*c*x*ArcSin[c*x]*Lo
g[1 - E^(I*ArcSin[c*x])] - 2*a*b*c*Pi*x*Log[1 - I*E^(I*ArcSin[c*x])] - 4*a*
b*c*x*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b^2*c*x*ArcSin[c*x]^2*Lo
g[1 - I*E^(I*ArcSin[c*x])] - 2*a*b*c*Pi*x*Log[1 + I*E^(I*ArcSin[c*x])] + 4*
a*b*c*x*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b^2*c*x*ArcSin[c*x]^2*
Log[1 + I*E^(I*ArcSin[c*x])] + 4*b^2*c*x*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*
x])] + a^2*c*x*Log[1 - c*x] - a^2*c*x*Log[1 + c*x] + 2*a*b*c*Pi*x*Log[-Cos[
(Pi + 2*ArcSin[c*x])/4]] + 2*a*b*c*Pi*x*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] -
(4*I)*b^2*c*x*PolyLog[2, -E^(I*ArcSin[c*x])] - (4*I)*b*c*x*(a + b*ArcSin[c*
x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (4*I)*a*b*c*x*PolyLog[2, I*E^(I*Ar
cSin[c*x])] + (4*I)*b^2*c*x*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] + (
4*I)*b^2*c*x*PolyLog[2, E^(I*ArcSin[c*x])] + 4*b^2*c*x*PolyLog[3, (-I)*E^(I
*ArcSin[c*x])] - 4*b^2*c*x*PolyLog[3, I*E^(I*ArcSin[c*x])])/(d*x)
```

Maple [A] (verified)

Time = 0.36 (sec) , antiderivative size = 474, normalized size of antiderivative = 1.99

method	result
parts	$-\frac{a^2\left(\frac{c\ln(cx-1)}{2}-\frac{c\ln(cx+1)}{2}+\frac{1}{x}\right)}{d}-\frac{b^2c\left(\frac{\arcsin(cx)^2}{cx}-2i\,\mathrm{dilog}\left(icx+\sqrt{-c^2x^2+1}\right)+2\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)\right.}{}$
derivativedivides	$c\left(-\frac{a^2\left(\frac{1}{cx}+\frac{\ln(cx-1)}{2}-\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b^2\left(\frac{\arcsin(cx)^2}{cx}-2i\,\mathrm{dilog}\left(icx+\sqrt{-c^2x^2+1}\right)+2\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)\right.}{}\right.$
default	$c\left(-\frac{a^2\left(\frac{1}{cx}+\frac{\ln(cx-1)}{2}-\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b^2\left(\frac{\arcsin(cx)^2}{cx}-2i\,\mathrm{dilog}\left(icx+\sqrt{-c^2x^2+1}\right)+2\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)\right.}{}\right.$

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

[Out] -a^2/d*(1/2*c*ln(c*x-1)-1/2*c*ln(c*x+1)+1/x)-b^2/d*c*(1/c/x*arcsin(c*x)^2-2*I*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))))-2*a*b/d*c*(1/c/x*arcsin(c*x)+arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))))

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)}\,dx = \int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)x^2}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d),x, algorithm="fricas")

[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^4 - d*x^2), x)

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)}\,dx = -\frac{\int \frac{a^2}{c^2x^4-x^2}\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{c^2x^4-x^2}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{c^2x^4-x^2}\,dx}{d}$$

[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d),x)

[Out] -(Integral(a**2/(c**2*x**4 - x**2), x) + Integral(b**2*asin(c*x)**2/(c**2*x**4 - x**2), x) + Integral(2*a*b*asin(c*x)/(c**2*x**4 - x**2), x))/d

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)}\,dx = \int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)x^2}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d),x, algorithm="maxima")

[Out] 1/2*a^2*(c*log(c*x + 1)/d - c*log(c*x - 1)/d - 2/(d*x)) + 1/2*(b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - b^2*c*x*arctan2(c*x

```
, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*b^2*arctan2(c*x, sqrt(c
*x + 1)*sqrt(-c*x + 1))^2 + 2*d*x*integrate(-(2*a*b*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1)) - (b^2*c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))*log(c*x + 1) - b^2*c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*lo
g(-c*x + 1) - 2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*
x + 1)*sqrt(-c*x + 1))/(c^2*d*x^4 - d*x^2), x))/(d*x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\,(d-c^2dx^2)}\,dx = \int -\frac{(b\arcsin\left(cx\right)+a)^2}{(c^2dx^2-d)x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)*x^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\,(d-c^2dx^2)}\,dx = \int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{x^2\,\left(d-c^2\,d\,x^2\right)}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)),x)
[Out] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)), x)
```

3.190 $\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 210

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)}\,dx &= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx}-\frac{(a+b\arcsin(cx))^2}{2dx^2}\\ &\quad-\frac{2c^2(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d}+\frac{b^2c^2\log(x)}{d}\\ &\quad+\frac{ibc^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d}\\ &\quad-\frac{ibc^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d}\\ &\quad-\frac{b^2c^2\operatorname{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d}+\frac{b^2c^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d}\end{aligned}$$

```
[Out] -1/2*(a+b*arcsin(c*x))^2/d/x^2-2*c^2*(a+b*arcsin(c*x))^2*arctanh((I*c*x+(-c
^2*x^2+1)^(1/2))^2)/d+b^2*c^2*ln(x)/d+I*b*c^2*(a+b*arcsin(c*x))*polylog(2,-
(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-I*b*c^2*(a+b*arcsin(c*x))*polylog(2,(I*c*x+
(-c^2*x^2+1)^(1/2))^2)/d-1/2*b^2*c^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^
2)/d+1/2*b^2*c^2*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-b*c*(a+b*arcsin(
c*x))*(-c^2*x^2+1)^(1/2)/d/x
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 210, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4789, 4769, 4504, 4268, 2611, 2320, 6724, 4771, 29}

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)}\,dx = -\frac{2c^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{d} + \frac{ibc^2\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d} - \frac{ibc^2\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx} - \frac{(a+b\arcsin(cx))^2}{2dx^2} - \frac{b^2c^2\,\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d} + \frac{b^2c^2\,\text{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d} + \frac{b^2c^2\log(x)}{d}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)),x]
```

```
[Out] -((b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(d*x)) - (a + b*ArcSin[c*x])^
2/(2*d*x^2) - (2*c^2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/
d + (b^2*c^2*Log[x])/d + (I*b*c^2*(a + b*ArcSin[c*x])*PolyLog[2, -E^((2*I)*
ArcSin[c*x])])/d - (I*b*c^2*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[
c*x])])/d - (b^2*c^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*d) + (b^2*c^2*P
olyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
```

```
f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = -\frac{(a+b\arcsin(cx))^2}{2dx^2}+c^2\int\frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)}\,dx+\frac{(bc)\int\frac{a+b\arcsin(cx)}{x^2\sqrt{1-c^2x^2}}\,dx}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx}-\frac{(a+b\arcsin(cx))^2}{2dx^2} + \frac{c^2\text{Subst}\left(\int(a+bx)^2\csc(x)\sec(x)\,dx,x,\arcsin(cx)\right)}{d}+\frac{(b^2c^2)\int\frac{1}{x}\,dx}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx}-\frac{(a+b\arcsin(cx))^2}{2dx^2} + \frac{b^2c^2\log(x)}{d}+\frac{(2c^2)\,\text{Subst}\left(\int(a+bx)^2\csc(2x)\,dx,x,\arcsin(cx)\right)}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx}-\frac{(a+b\arcsin(cx))^2}{2dx^2} - \frac{2c^2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d}+\frac{b^2c^2\log(x)}{d} - \frac{(2bc^2)\,\text{Subst}\left(\int(a+bx)\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d} + \frac{(2bc^2)\,\text{Subst}\left(\int(a+bx)\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx}-\frac{(a+b\arcsin(cx))^2}{2dx^2} - \frac{2c^2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d}+\frac{b^2c^2\log(x)}{d} + \frac{ibc^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d} - \frac{ibc^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d} - \frac{(ib^2c^2)\,\text{Subst}\left(\int\text{PolyLog}\left(2,-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d} + \frac{(ib^2c^2)\,\text{Subst}\left(\int\text{PolyLog}\left(2,e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx} - \frac{(a+b\arcsin(cx))^2}{2dx^2} - \frac{2c^2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d} + \frac{b^2c^2\log(x)}{d} + \frac{ibc^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d} - \frac{ibc^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d} - \frac{(b^2c^2)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{2d} + \frac{(b^2c^2)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{2d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx} - \frac{(a+b\arcsin(cx))^2}{2dx^2} - \frac{2c^2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d} + \frac{b^2c^2\log(x)}{d} + \frac{ibc^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d} - \frac{ibc^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d} - \frac{b^2c^2\,\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d} + \frac{b^2c^2\,\text{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 647 vs. 2(210) = 420.

Time = 1.06 (sec) , antiderivative size = 647, normalized size of antiderivative = 3.08

$$\int\frac{(a+b\arcsin(cx))^2}{x^3\,(d-c^2dx^2)}\,dx = -\frac{\frac{1}{12}ib^2c^2\pi^3 + \frac{a^2}{x^2} + \frac{2abc\sqrt{1-c^2x^2}}{x} + 4iabc^2\pi\arcsin(cx) + \frac{2ab\arcsin(cx)}{x^2} + \frac{2b^2c\sqrt{1-c^2x^2}\arcsin(cx)}{x} + \frac{b^2\arcsin(cx)^2}{x^2} - \frac{4}{3}i}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)),x]
```

```
[Out] -1/2*((I/12)*b^2*c^2*Pi^3 + a^2/x^2 + (2*a*b*c*Sqrt[1 - c^2*x^2])/x + (4*I)
*a*b*c^2*Pi*ArcSin[c*x] + (2*a*b*ArcSin[c*x])/x^2 + (2*b^2*c*Sqrt[1 - c^2*x
^2]*ArcSin[c*x])/x + (b^2*ArcSin[c*x]^2)/x^2 - ((4*I)/3)*b^2*c^2*ArcSin[c*x
]^3 + 8*a*b*c^2*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 2*a*b*c^2*Pi*Log[1 - I*E
^(I*ArcSin[c*x])] + 4*a*b*c^2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*
a*b*c^2*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 4*a*b*c^2*ArcSin[c*x]*Log[1 + I*E
```

```
^(I*ArcSin[c*x])] - 2*b^2*c^2*ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])]
 - 4*a*b*c^2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 2*b^2*c^2*ArcSin[
c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x])] - 2*a^2*c^2*Log[x] - 2*b^2*c^2*Log[(c
*x)/Sqrt[1 - c^2*x^2]] + a^2*c^2*Log[1 - c^2*x^2] - b^2*c^2*Log[1 - c^2*x^2
] - 8*a*b*c^2*Pi*Log[Cos[ArcSin[c*x]/2]] + 2*a*b*c^2*Pi*Log[-Cos[(Pi + 2*Ar
cSin[c*x])/4]] - 2*a*b*c^2*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (4*I)*a*b*
c^2*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (4*I)*a*b*c^2*PolyLog[2, I*E^(I*Ar
cSin[c*x])] - (2*I)*b^2*c^2*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])]
- (2*I)*b^2*c^2*ArcSin[c*x]*PolyLog[2, -E^((2*I)*ArcSin[c*x])] + (2*I)*a*b*
c^2*PolyLog[2, E^((2*I)*ArcSin[c*x])] - b^2*c^2*PolyLog[3, E^((-2*I)*ArcSin
[c*x])] + b^2*c^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/d
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 609 vs. $2(250) = 500$.

Time = 0.35 (sec) , antiderivative size = 610, normalized size of antiderivative = 2.90

method	result
derivativedivides	$c^2\left(-\frac{a^2\left(\frac{1}{2c^2x^2}-\ln(cx)+\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b^2\left(\frac{\arcsin(cx)\left(-2ic^2x^2+2cx\sqrt{-c^2x^2+1}+\arcsin(cx)\right)}{2c^2x^2}-\ln\left(icx+\sqrt{-c^2x^2}\right.\right.}{}\right.$
default	$c^2\left(-\frac{a^2\left(\frac{1}{2c^2x^2}-\ln(cx)+\frac{\ln(cx-1)}{2}+\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b^2\left(\frac{\arcsin(cx)\left(-2ic^2x^2+2cx\sqrt{-c^2x^2+1}+\arcsin(cx)\right)}{2c^2x^2}-\ln\left(icx+\sqrt{-c^2x^2}\right.\right.}{}\right.$
parts	$-\frac{a^2\left(\frac{1}{2x^2}-c^2\ln(x)+\frac{c^2\ln(cx-1)}{2}+\frac{c^2\ln(cx+1)}{2}\right)}{d}-\frac{b^2c^2\left(\frac{\arcsin(cx)\left(-2ic^2x^2+2cx\sqrt{-c^2x^2+1}+\arcsin(cx)\right)}{2c^2x^2}-\ln\left(icx+\sqrt{-c^2x}\right.\right.}{}$

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(-a^2/d*(1/2/c^2/x^2-ln(c*x)+1/2*ln(c*x-1)+1/2*ln(c*x+1))-b^2/d*(1/2*ar
csin(c*x)*(-2*I*c^2*x^2+2*c*x*(-c^2*x^2+1)^(1/2)+arcsin(c*x))/c^2/x^2-ln(I*
c*x+(-c^2*x^2+1)^(1/2)-1)+2*ln(I*c*x+(-c^2*x^2+1)^(1/2))-ln(1+I*c*x+(-c^2*x
^2+1)^(1/2))-arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*p
olylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+
arcsin(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-I*arcsin(c*x)*polylog(2,-(
I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-a
rcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*polylog(2,I*c*x
+(-c^2*x^2+1)^(1/2))-2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2)))-2*a*b/d*(1/2*(-
I*c^2*x^2+c*x*(-c^2*x^2+1)^(1/2)+arcsin(c*x))/c^2/x^2-arcsin(c*x)*ln(1+I*c*
x+(-c^2*x^2+1)^(1/2))+I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+arcsin(c*x)*ln
```

```
(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2)
)^2)-arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+I*polylog(2,I*c*x+(-c^2*x^2
+1)^(1/2))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)}\,dx=\int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d),x, algorithm="fricas")
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^5 - d*x^3)
, x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)}\,dx=-\frac{\int \frac{a^2}{c^2x^5-x^3}\,dx+\int \frac{b^2\operatorname{asin}^2(cx)}{c^2x^5-x^3}\,dx+\int \frac{2ab\operatorname{asin}(cx)}{c^2x^5-x^3}\,dx}{d}$$

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d),x)
[Out] -(Integral(a**2/(c**2*x**5 - x**3), x) + Integral(b**2*asin(c*x)**2/(c**2*x
**5 - x**3), x) + Integral(2*a*b*asin(c*x)/(c**2*x**5 - x**3), x))/d
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)}\,dx=\int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d),x, algorithm="maxima")
[Out] -1/2*(c^2*log(c*x + 1)/d + c^2*log(c*x - 1)/d - 2*c^2*log(x)/d + 1/(d*x^2))
*a^2 - integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^2*d*x^5 - d*x^3), x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\left(d-c^2dx^2\right)}\,dx=\int -\frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(c^2dx^2-d\right)x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)*x^3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\left(d-c^2dx^2\right)}\,dx=\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{x^3\,\left(d-c^2\,d\,x^2\right)}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)),x)
[Out] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)), x)
```

3.191 $\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 333

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)}\,dx =& -\frac{b^2c^2}{3dx}-\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2}\\ &-\frac{(a+b\arcsin(cx))^2}{3dx^3}-\frac{c^2(a+b\arcsin(cx))^2}{dx}\\ &-\frac{2ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d}\\ &-\frac{14bc^3(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d}\\ &+\frac{7ib^2c^3\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{3d}\\ &+\frac{2ibc^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d}\\ &-\frac{2ibc^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d}\\ &-\frac{7ib^2c^3\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{3d}\\ &-\frac{2b^2c^3\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{d}\\ &+\frac{2b^2c^3\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{d}\end{aligned}$$

```
[Out] -1/3*b^2*c^2/d/x-1/3*(a+b*arcsin(c*x))^2/d/x^3-c^2*(a+b*arcsin(c*x))^2/d/x-
2*I*c^3*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d-14/3*b*c^3*(
a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))/d+7/3*I*b^2*c^3*polylog(
2,-I*c*x-(-c^2*x^2+1)^(1/2))/d+2*I*b*c^3*(a+b*arcsin(c*x))*polylog(2,-I*(I*
c*x+(-c^2*x^2+1)^(1/2)))/d-2*I*b*c^3*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(
```

```
-c^2*x^2+1)^(1/2)))/d-7/3*I*b^2*c^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))/d-2
*b^2*c^3*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d+2*b^2*c^3*polylog(3,I*(
I*c*x+(-c^2*x^2+1)^(1/2)))/d-1/3*b*c*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/d
/x^2
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 333, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.407$, Rules used = {4789, 4749, 4266, 2611, 2320, 6724, 4803, 4268, 2317, 2438, 30}

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)}\,dx = -\frac{2ic^3\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{d} - \frac{14bc^3\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3d} + \frac{2ibc^3\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d} - \frac{2ibc^3\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2} - \frac{c^2(a+b\arcsin(cx))^2}{dx} - \frac{(a+b\arcsin(cx))^2}{3dx^3} + \frac{7ib^2c^3\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{3d} - \frac{7ib^2c^3\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{3d} - \frac{2b^2c^3\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{d} + \frac{2b^2c^3\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{d} - \frac{b^2c^2}{3dx}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)),x]
```

```
[Out] -1/3*(b^2*c^2)/(d*x) - (b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*d*x^2
) - (a + b*ArcSin[c*x])^2/(3*d*x^3) - (c^2*(a + b*ArcSin[c*x])^2)/(d*x) - (
(2*I)*c^3*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d - (14*b*c^3*(a
 + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(3*d) + (((7*I)/3)*b^2*c^3*Po
lyLog[2, -E^(I*ArcSin[c*x])])/d + ((2*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[
2, (-I)*E^(I*ArcSin[c*x])])/d - ((2*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2,
 I*E^(I*ArcSin[c*x])])/d - (((7*I)/3)*b^2*c^3*PolyLog[2, E^(I*ArcSin[c*x])]
)/d - (2*b^2*c^3*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/d + (2*b^2*c^3*PolyLog
[3, I*E^(I*ArcSin[c*x])])/d
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = -\frac{(a+b\arcsin(cx))^2}{3dx^3} + c^2\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)}\,dx + \frac{(2bc)\int \frac{a+b\arcsin(cx)}{x^3\sqrt{1-c^2x^2}}\,dx}{3d}$$

$$= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2} - \frac{(a+b\arcsin(cx))^2}{3dx^3} - \frac{c^2(a+b\arcsin(cx))^2}{dx} + c^4\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx + \frac{(b^2c^2)\int \frac{1}{x^2}\,dx}{3d} + \frac{(bc^3)\int \frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{3d} + \frac{(2bc^3)\int \frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{d}$$

$$
\begin{aligned}
&= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2} - \frac{(a+b\arcsin(cx))^2}{3dx^3} \\
&\quad - \frac{c^2(a+b\arcsin(cx))^2}{dx} + \frac{c^3\text{Subst}\left(\int(a+bx)^2\sec(x)\,dx,x,\arcsin(cx)\right)}{d} \\
&\quad + \frac{(bc^3)\,\text{Subst}(\int(a+bx)\csc(x)\,dx,x,\arcsin(cx))}{3d} \\
&\quad + \frac{(2bc^3)\,\text{Subst}(\int(a+bx)\csc(x)\,dx,x,\arcsin(cx))}{d} \\
&= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2} - \frac{(a+b\arcsin(cx))^2}{3dx^3} \\
&\quad - \frac{c^2(a+b\arcsin(cx))^2}{dx} - \frac{2ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d} \\
&\quad - \frac{14bc^3(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d} \\
&\quad - \frac{(2bc^3)\,\text{Subst}\left(\int(a+bx)\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d} \\
&\quad + \frac{(2bc^3)\,\text{Subst}\left(\int(a+bx)\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d} \\
&\quad - \frac{(b^2c^3)\,\text{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3d} \\
&\quad + \frac{(b^2c^3)\,\text{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3d} \\
&\quad - \frac{(2b^2c^3)\,\text{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d} \\
&\quad + \frac{(2b^2c^3)\,\text{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d}
\end{aligned}
$$

$$= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2} - \frac{(a+b\arcsin(cx))^2}{3dx^3} - \frac{c^2(a+b\arcsin(cx))^2}{dx} - \frac{2ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d} - \frac{14bc^3(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d} + \frac{2ibc^3(a+b\arcsin(cx))\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d} - \frac{2ibc^3(a+b\arcsin(cx))\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d} + \frac{(ib^2c^3)\,\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3d} - \frac{(ib^2c^3)\,\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3d} + \frac{(2ib^2c^3)\,\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d} - \frac{(2ib^2c^3)\,\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d} - \frac{(2ib^2c^3)\,\text{Subst}\left(\int\text{PolyLog}\left(2,-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d} + \frac{(2ib^2c^3)\,\text{Subst}\left(\int\text{PolyLog}\left(2,ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d}$$

$$= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2} - \frac{(a+b\arcsin(cx))^2}{3dx^3} - \frac{c^2(a+b\arcsin(cx))^2}{dx} - \frac{2ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d} - \frac{14bc^3(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d} + \frac{7ib^2c^3\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{3d} + \frac{2ibc^3(a+b\arcsin(cx))\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d} - \frac{2ibc^3(a+b\arcsin(cx))\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d} - \frac{7ib^2c^3\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{3d} - \frac{(2b^2c^3)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d} + \frac{(2b^2c^3)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d}$$

$$= -\frac{b^2c^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2} - \frac{(a+b\arcsin(cx))^2}{3dx^3} - \frac{c^2(a+b\arcsin(cx))^2}{dx} - \frac{2ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d} - \frac{14bc^3(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d} + \frac{7ib^2c^3\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{3d} + \frac{2ibc^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d} - \frac{2ibc^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d} - \frac{7ib^2c^3\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{3d} - \frac{2b^2c^3\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{d} + \frac{2b^2c^3\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{d}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 849 vs. $2(333) = 666$.

Time = 7.44 (sec) , antiderivative size = 849, normalized size of antiderivative = 2.55

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)}\,dx = -\frac{a^2}{3dx^3} - \frac{a^2c^2}{dx} - \frac{a^2c^3\log(1-cx)}{2d} + \frac{a^2c^3\log(1+cx)}{2d} - \frac{2ab\left(-c^2\left(-\frac{\arcsin(cx)}{x} - c\,\text{arctanh}\left(\sqrt{1-c^2x^2}\right)\right) + \frac{cx\sqrt{1-c^2x^2}+2\arcsin(cx)+c^3x^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6x^3} + \frac{1}{2}c^4\left(\frac{3i\pi\,\text{arc}}{2}\right.\right.}{} - \frac{b^2c^3\left(4\cot\left(\frac{1}{2}\arcsin(cx)\right) + 14\arcsin(cx)^2\cot\left(\frac{1}{2}\arcsin(cx)\right) + 2\arcsin(cx)\csc^2\left(\frac{1}{2}\arcsin(cx)\right) + \frac{1}{2}cx\,\text{ar}\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)),x]
```

```
[Out] -1/3*a^2/(d*x^3) - (a^2*c^2)/(d*x) - (a^2*c^3*Log[1 - c*x])/(2*d) + (a^2*c^
3*Log[1 + c*x])/(2*d) - (2*a*b*(-(c^2*(-(ArcSin[c*x]/x) - c*ArcTanh[Sqrt[1
- c^2*x^2]])) + (c*x*Sqrt[1 - c^2*x^2] + 2*ArcSin[c*x] + c^3*x^3*ArcTanh[Sq
rt[1 - c^2*x^2]])/(6*x^3) + (c^4*((((3*I)/2)*Pi*ArcSin[c*x])/c - ((I/2)*Arc
Sin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c - (Pi*Log[1 + I*E^(I
*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])])/c - (2*Pi*
Log[Cos[ArcSin[c*x]/2]])/c + (Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]])/c - ((2
*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/c))/2 - (c^4*(((I/2)*Pi*ArcSin[c*x]
)/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c + (P
i*Log[1 - I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*
x])])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c - (Pi*Log[Sin[(Pi + 2*ArcSin[c*x
])/4]])/c - ((2*I)*PolyLog[2, I*E^(I*ArcSin[c*x])])/c))/2))/d - (b^2*c^3*(4
*Cot[ArcSin[c*x]/2] + 14*ArcSin[c*x]^2*Cot[ArcSin[c*x]/2] + 2*ArcSin[c*x]*C
sc[ArcSin[c*x]/2]^2 + (c*x*ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^4)/2 - 56*ArcSi
```

n[c*x]*Log[1 - E^(I*ArcSin[c*x])] - 24*ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[c*x])] + 24*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] + 56*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (56*I)*PolyLog[2, -E^(I*ArcSin[c*x])] - (48*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (48*I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] + (56*I)*PolyLog[2, E^(I*ArcSin[c*x])] + 48*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] - 48*PolyLog[3, I*E^(I*ArcSin[c*x])] - 2*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + (8*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2]^4)/(c^3*x^3) + 4*Tan[ArcSin[c*x]/2] + 14*ArcSin[c*x]^2*Tan[ArcSin[c*x]/2]))/(24*d)

Maple [A] (verified)

Time = 0.49 (sec) , antiderivative size = 561, normalized size of antiderivative = 1.68

method	result
derivativedivides	$c^3\left(-\frac{a^2\left(\frac{1}{3c^3x^3}+\frac{1}{cx}+\frac{\ln(cx-1)}{2}-\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b^2\left(\frac{3\arcsin(cx)^2x^2c^2+\sqrt{-c^2x^2+1}\,\arcsin(cx)xc+\arcsin(cx)^2+c^2x^2}{3c^3x^3}-\frac{7i\,\mathrm{dilog}(\cdots\right.}{}\right.$
default	$c^3\left(-\frac{a^2\left(\frac{1}{3c^3x^3}+\frac{1}{cx}+\frac{\ln(cx-1)}{2}-\frac{\ln(cx+1)}{2}\right)}{d}-\frac{b^2\left(\frac{3\arcsin(cx)^2x^2c^2+\sqrt{-c^2x^2+1}\,\arcsin(cx)xc+\arcsin(cx)^2+c^2x^2}{3c^3x^3}-\frac{7i\,\mathrm{dilog}(\cdots\right.}{}\right.$
parts	$-\frac{a^2\left(\frac{1}{3x^3}+\frac{c^2}{x}+\frac{c^3\ln(cx-1)}{2}-\frac{c^3\ln(cx+1)}{2}\right)}{d}-\frac{b^2c^3\left(\frac{3\arcsin(cx)^2x^2c^2+\sqrt{-c^2x^2+1}\,\arcsin(cx)xc+\arcsin(cx)^2+c^2x^2}{3c^3x^3}-\frac{7i\,\mathrm{dilog}(\cdots\right.}{}$

[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d),x,method=_RETURNVERBOSE)

[Out] c^3*(-a^2/d*(1/3/c^3/x^3+1/c/x+1/2*ln(c*x-1)-1/2*ln(c*x+1))-b^2/d*(1/3*(3*arcsin(c*x)^2*x^2*c^2+(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c+arcsin(c*x)^2+c^2*x^2)/c^3/x^3-7/3*I*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+7/3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-7/3*I*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))))-2*a*b/d*(1/6*(6*c^2*x^2*arcsin(c*x)+c*x*(-c^2*x^2+1)^(1/2)+2*arcsin(c*x))/c^3/x^3+arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-7/6*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+7/6*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)}\,dx = \int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d),x, algorithm="fricas")
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^6 - d*x^4)
, x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)}\,dx = -\frac{\int \frac{a^2}{c^2x^6-x^4}\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{c^2x^6-x^4}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{c^2x^6-x^4}\,dx}{d}$$

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d),x)
[Out] -(Integral(a**2/(c**2*x**6 - x**4), x) + Integral(b**2*asin(c*x)**2/(c**2*x
**6 - x**4), x) + Integral(2*a*b*asin(c*x)/(c**2*x**6 - x**4), x))/d
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)}\,dx = \int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d),x, algorithm="maxima")
[Out] 1/6*(3*c^3*log(c*x + 1)/d - 3*c^3*log(c*x - 1)/d - 2*(3*c^2*x^2 + 1)/(d*x^3
))*a^2 + 1/6*(3*b^2*c^3*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*lo
g(c*x + 1) - 3*b^2*c^3*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log
(-c*x + 1) + 6*d*x^3*integrate(-1/3*(6*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1)) - (3*b^2*c^4*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(
c*x + 1) - 3*b^2*c^4*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*
x + 1) - 2*(3*b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d*x^6 - d*x^4), x) - 2*(3*b^2*c^2*
x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/(d*x^3)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)}\,dx = \int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)*x^4), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^4\,(d-c^2\,d\,x^2)}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)),x)
[Out] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)), x)
```

3.192 $\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 300

$$\begin{aligned}\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx =& -\frac{2b^2x}{c^4d^2}-\frac{b(a+b\arcsin(cx))}{c^5d^2\sqrt{1-c^2x^2}}+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d^2}\\&+\frac{3x(a+b\arcsin(cx))^2}{2c^4d^2}+\frac{x^3(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)}\\&+\frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d^2}+\frac{b^2\operatorname{arctanh}(cx)}{c^5d^2}\\&-\frac{3ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^5d^2}\\&+\frac{3ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^5d^2}\\&+\frac{3b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{c^5d^2}-\frac{3b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{c^5d^2}\end{aligned}$$

```
[Out] -2*b^2*x/c^4/d^2+3/2*x*(a+b*arcsin(c*x))^2/c^4/d^2+1/2*x^3*(a+b*arcsin(c*x)
)^2/c^2/d^2/(-c^2*x^2+1)+3*I*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^
(1/2))/c^5/d^2+b^2*arctanh(c*x)/c^5/d^2-3*I*b*(a+b*arcsin(c*x))*polylog(2,-
I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^2+3*I*b*(a+b*arcsin(c*x))*polylog(2,I*(
I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^2+3*b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(
1/2)))/c^5/d^2-3*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^2-b*(a+b
*arcsin(c*x))/c^5/d^2/(-c^2*x^2+1)^(1/2)+2*b*(a+b*arcsin(c*x))*(-c^2*x^2+1)
^(1/2)/c^5/d^2
```

Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 300, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.519, Rules used = {4791, 4795, 4749, 4266, 2611, 2320, 6724, 4767, 8, 272, 45, 4779, 396, 214}

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \frac{3i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{c^5d^2} - \frac{3ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^5d^2} + \frac{3ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^5d^2} + \frac{3x(a+b\arcsin(cx))^2}{2c^4d^2} + \frac{x^3(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d^2} - \frac{b(a+b\arcsin(cx))}{c^5d^2\sqrt{1-c^2x^2}} + \frac{3b^2\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{c^5d^2} - \frac{3b^2\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{c^5d^2} + \frac{b^2\text{arctanh}(cx)}{c^5d^2} - \frac{2b^2x}{c^4d^2}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] (-2*b^2*x)/(c^4*d^2) - (b*(a + b*ArcSin[c*x]))/(c^5*d^2*Sqrt[1 - c^2*x^2])
+ (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c^5*d^2) + (3*x*(a + b*ArcSi
n[c*x])^2)/(2*c^4*d^2) + (x^3*(a + b*ArcSin[c*x])^2)/(2*c^2*d^2*(1 - c^2*x^
2)) + ((3*I)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/(c^5*d^2) + (
b^2*ArcTanh[c*x])/(c^5*d^2) - ((3*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*
E^(I*ArcSin[c*x])])/(c^5*d^2) + ((3*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E
^(I*ArcSin[c*x])])/(c^5*d^2) + (3*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(
c^5*d^2) - (3*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c^5*d^2)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{x^3(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{b\int \frac{x^3(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{cd^2} - \frac{3\int \frac{x^2(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{2c^2d}$$

$$= -\frac{b(a+b\arcsin(cx))}{c^5d^2\sqrt{1-c^2x^2}} - \frac{b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d^2} + \frac{3x(a+b\arcsin(cx))^2}{2c^4d^2} + \frac{x^3(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{b^2\int \frac{2-c^2x^2}{c^4-c^6x^2}\,dx}{d^2} - \frac{(3b)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{c^3d^2} - \frac{3\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{2c^4d}$$

$$= \frac{b^2x}{c^4d^2} - \frac{b(a+b\arcsin(cx))}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d^2} + \frac{3x(a+b\arcsin(cx))^2}{2c^4d^2} + \frac{x^3(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{b^2\int \frac{1}{c^4-c^6x^2}\,dx}{d^2} - \frac{3\text{Subst}\left(\int (a+bx)^2\sec(x)\,dx, x, \arcsin(cx)\right)}{2c^5d^2} - \frac{(3b^2)\int 1\,dx}{c^4d^2}$$

$$= -\frac{2b^2x}{c^4d^2} - \frac{b(a+b\arcsin(cx))}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d^2} + \frac{3x(a+b\arcsin(cx))^2}{2c^4d^2} + \frac{x^3(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d^2} + \frac{b^2\text{arctanh}(cx)}{c^5d^2} + \frac{(3b)\text{Subst}\left(\int (a+bx)\log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^5d^2} - \frac{(3b)\text{Subst}\left(\int (a+bx)\log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^5d^2}$$

$$= -\frac{2b^2x}{c^4d^2} - \frac{b(a+b\arcsin(cx))}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d^2} + \frac{3x(a+b\arcsin(cx))^2}{2c^4d^2} + \frac{x^3(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d^2} + \frac{b^2\text{arctanh}(cx)}{c^5d^2} - \frac{3ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2, -ie^{i\arcsin(cx)}\right)}{c^5d^2} + \frac{3ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2, ie^{i\arcsin(cx)}\right)}{c^5d^2} + \frac{(3ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2, -ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^5d^2} - \frac{(3ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2, ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^5d^2}$$

$$= -\frac{2b^2x}{c^4d^2} - \frac{b(a+b\arcsin(cx))}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d^2} + \frac{3x(a+b\arcsin(cx))^2}{2c^4d^2} + \frac{x^3(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d^2} + \frac{b^2\text{arctanh}(cx)}{c^5d^2} - \frac{3ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^5d^2} + \frac{3ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^5d^2} + \frac{(3b^2)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^5d^2} - \frac{(3b^2)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^5d^2}$$

$$= -\frac{2b^2x}{c^4d^2} - \frac{b(a+b\arcsin(cx))}{c^5d^2\sqrt{1-c^2x^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d^2} + \frac{3x(a+b\arcsin(cx))^2}{2c^4d^2} + \frac{x^3(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^5d^2} + \frac{b^2\text{arctanh}(cx)}{c^5d^2} - \frac{3ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^5d^2} + \frac{3ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^5d^2} + \frac{3b^2\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{c^5d^2} - \frac{3b^2\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{c^5d^2}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 614 vs. $2(300) = 600$.

Time = 2.82 (sec) , antiderivative size = 614, normalized size of antiderivative = 2.05

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \frac{4a^2cx + \frac{8b^2c^3x^3}{1-c^2x^2} + 8ab\sqrt{1-c^2x^2} + \frac{2ab\sqrt{1-c^2x^2}}{-1+cx} - \frac{2ab\sqrt{1-c^2x^2}}{1+cx} - \frac{2a^2cx}{-1+c^2x^2} + \frac{8b^2cx}{-1+c^2x^2} + 6iab\pi\arcsin(cx) + 8abcx\ldots}{}$$

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

[Out] (4*a^2*c*x + (8*b^2*c^3*x^3)/(1 - c^2*x^2) + 8*a*b*Sqrt[1 - c^2*x^2] + (2*a*b*Sqrt[1 - c^2*x^2])/(-1 + c*x) - (2*a*b*Sqrt[1 - c^2*x^2])/(1 + c*x) - (2*a^2*c*x)/(-1 + c^2*x^2) + (8*b^2*c*x)/(-1 + c^2*x^2) + (6*I)*a*b*Pi*ArcSin[c*x] + 8*a*b*c*x*ArcSin[c*x] - (2*a*b*ArcSin[c*x])/(-1 + c*x) - (2*a*b*ArcSin[c*x])/(1 + c*x) + (2*b^2*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (6*b^2*c^2*x^2*ArcSin[c*x])/Sqrt[1 - c^2*x^2] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + (6*b^2*c*x*ArcSin[c*x]^2)/(1 - c^2*x^2) + (4*b^2*c^3*x^3*ArcSin[c*x]^2)/(-1 + c^2*x^2) + (12*I)*b^2*ArcSin[c*x]^2*ArcTan[E^(I*ArcSin[c*x])] + 4*b^2*ArcTanh[c*x] - 6*a*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 12*a*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 6*a*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 12*a*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 3*a^2*Log[1 - c*x] - 3*a^2*Log[1 + c*x] + 6*a*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 6*a*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (12*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (12*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])] + 12*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] - 12*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(4*c^5*d^2)

Maple [A] (verified)

Time = 0.35 (sec) , antiderivative size = 618, normalized size of antiderivative = 2.06

method	result
derivativedivides	$\frac{\frac{a^2\left(cx-\frac{1}{4(cx-1)}+\frac{3\ln(cx-1)}{4}-\frac{1}{4(cx+1)}-\frac{3\ln(cx+1)}{4}\right)}{d^2}+\frac{2b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{d^2}+\frac{b^2\arcsin(cx)^2cx}{d^2}-\frac{2b^2cx}{d^2}-\frac{b^2\arcsin(cx)^2cx}{2d^2\left(c^2x^2-1\right)}+}{}$
default	$\frac{\frac{a^2\left(cx-\frac{1}{4(cx-1)}+\frac{3\ln(cx-1)}{4}-\frac{1}{4(cx+1)}-\frac{3\ln(cx+1)}{4}\right)}{d^2}+\frac{2b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{d^2}+\frac{b^2\arcsin(cx)^2cx}{d^2}-\frac{2b^2cx}{d^2}-\frac{b^2\arcsin(cx)^2cx}{2d^2\left(c^2x^2-1\right)}+}{}$
parts	$\frac{a^2\left(\frac{x}{c^4}-\frac{1}{4c^5(cx-1)}+\frac{3\ln(cx-1)}{4c^5}-\frac{1}{4c^5(cx+1)}-\frac{3\ln(cx+1)}{4c^5}\right)}{d^2}+\frac{2b^2\arcsin(cx)\sqrt{-c^2x^2+1}}{d^2c^5}+\frac{b^2\arcsin(cx)^2x}{d^2c^4}-\frac{2b^2x}{c^4d^2}-$

[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)

[Out] 1/c^5*(a^2/d^2*(c*x-1/4/(c*x-1)+3/4*ln(c*x-1)-1/4/(c*x+1)-3/4*ln(c*x+1))+2*b^2/d^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+b^2/d^2*arcsin(c*x)^2*c*x-2*b^2/d^2*c*x-1/2*b^2/d^2/(c^2*x^2-1)*arcsin(c*x)^2*c*x+b^2/d^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+3/2*b^2/d^2*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*b^2/d^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))+3*b^2/d^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/2*b^2/d^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3*I*a*b/d^2*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3*b^2/d^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3*I*b^2/d^2*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*a*b/d^2*(-c^2*x^2+1)^(1/2)+2*a*b/d^2*arcsin(c*x)*c*x-a*b/d^2/(c^2*x^2-1)*arcsin(c*x)*c*x+a*b/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)+3*a*b/d^2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3*a*b/d^2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3*I*a*b/d^2*dilog(1-I*(I*c*

```
x+(-c^2*x^2+1)^(1/2))-3*I*b^2/d^2*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^
2+1)^(1/2))))
```

Fricas [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2x^4}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)/(c^4*d^2
*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \frac{\int \frac{a^2x^4}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{b^2x^4\operatorname{asin}^2{(cx)}}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{2abx^4\operatorname{asin}{(cx)}}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
[Out] (Integral(a**2*x**4/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x**4*
asin(c*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x**4*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Maxima [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2x^4}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
[Out] -1/4*a^2*(2*x/(c^6*d^2*x^2 - c^4*d^2) - 4*x/(c^4*d^2) + 3*log(c*x + 1)/(c^5
*d^2) - 3*log(c*x - 1)/(c^5*d^2)) - 1/4*(3*(b^2*c^2*x^2 - b^2)*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 3*(b^2*c^2*x^2 - b^2)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*(2*b^2*c^3*x^3 -
3*b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 4*(c^7*d^2*x^2 -
c^5*d^2)*integrate(-1/2*(4*a*b*c^4*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)) - (3*(b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*
log(c*x + 1) - 3*(b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))*log(-c*x + 1) - 2*(2*b^2*c^3*x^3 - 3*b^2*c*x)*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^8*d^2*x^4 - 2*c^6*d^2*
x^2 + c^4*d^2), x))/(c^7*d^2*x^2 - c^5*d^2)
```

Giac [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^4}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2*x^4/(c^2*d*x^2 - d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{x^4\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^2}\,dx$$

```
[In] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2,x)
[Out] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2, x)
```

3.193 $\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 227

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = -\frac{bx(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}}+\frac{(a+b\arcsin(cx))^2}{2c^4d^2}+\frac{x^2(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)}-\frac{i(a+b\arcsin(cx))^3}{3bc^4d^2}+\frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d^2}-\frac{b^2\log(1-c^2x^2)}{2c^4d^2}-\frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^4d^2}+\frac{b^2\operatorname{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2c^4d^2}$$

```
[Out] 1/2*(a+b*arcsin(c*x))^2/c^4/d^2+1/2*x^2*(a+b*arcsin(c*x))^2/c^2/d^2/(-c^2*x
^2+1)-1/3*I*(a+b*arcsin(c*x))^3/b/c^4/d^2+(a+b*arcsin(c*x))^2*ln(1+(I*c*x+(
-c^2*x^2+1)^(1/2))^2)/c^4/d^2-1/2*b^2*ln(-c^2*x^2+1)/c^4/d^2-I*b*(a+b*arcsi
n(c*x))*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^4/d^2+1/2*b^2*polylog(3,
-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^4/d^2-b*x*(a+b*arcsin(c*x))/c^3/d^2/(-c^2*
x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4791, 4765, 3800, 2221, 2611, 2320, 6724, 4737, 266}

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = -\frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^4d^2} - \frac{i(a+b\arcsin(cx))^3}{3bc^4d^2} + \frac{(a+b\arcsin(cx))^2}{2c^4d^2} + \frac{\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{c^4d^2} + \frac{x^2(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{bx(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{b^2\,\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2c^4d^2} - \frac{b^2\log(1-c^2x^2)}{2c^4d^2}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((b*x*(a + b*ArcSin[c*x]))/(c^3*d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*
x])^2/(2*c^4*d^2) + (x^2*(a + b*ArcSin[c*x])^2)/(2*c^2*d^2*(1 - c^2*x^2)) -
 ((I/3)*(a + b*ArcSin[c*x])^3)/(b*c^4*d^2) + ((a + b*ArcSin[c*x])^2*Log[1 +
 E^((2*I)*ArcSin[c*x])])/(c^4*d^2) - (b^2*Log[1 - c^2*x^2])/(2*c^4*d^2) - (
I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^4*d^2) + (b^
2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*c^4*d^2)
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{x^2(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{b\int \frac{x^2(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{cd^2} - \frac{\int \frac{x(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{c^2d}$$

$$= -\frac{bx(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x^2(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{\text{Subst}\left(\int (a+bx)^2\tan(x)\,dx, x, \arcsin(cx)\right)}{c^4d^2} + \frac{b\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{c^3d^2} + \frac{b^2\int \frac{x}{1-c^2x^2}\,dx}{c^2d^2}$$

$$= -\frac{bx(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2c^4d^2} + \frac{x^2(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))^3}{3bc^4d^2} - \frac{b^2\log(1-c^2x^2)}{2c^4d^2} + \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)^2}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{c^4d^2}$$

$$= -\frac{bx(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2c^4d^2} + \frac{x^2(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))^3}{3bc^4d^2} + \frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d^2} - \frac{b^2\log(1-c^2x^2)}{2c^4d^2} - \frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{c^4d^2}$$

$$= -\frac{bx(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2c^4d^2} + \frac{x^2(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))^3}{3bc^4d^2} + \frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d^2} - \frac{b^2\log(1-c^2x^2)}{2c^4d^2} - \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^4d^2} + \frac{(ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{c^4d^2}$$

$$= -\frac{bx(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2c^4d^2} + \frac{x^2(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))^3}{3bc^4d^2} + \frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d^2} - \frac{b^2\log(1-c^2x^2)}{2c^4d^2} - \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^4d^2} + \frac{b^2\text{Subst}\left(\int \frac{\text{PolyLog}(2,-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2c^4d^2}$$

$$= -\frac{bx(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2c^4d^2} + \frac{x^2(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))^3}{3bc^4d^2} + \frac{(a+b\arcsin(cx))^2\log\left(1+e^{2i\arcsin(cx)}\right)}{c^4d^2} - \frac{b^2\log(1-c^2x^2)}{2c^4d^2} - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^4d^2} + \frac{b^2\operatorname{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2c^4d^2}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 502 vs. 2(227) = 454.

Time = 1.21 (sec) , antiderivative size = 502, normalized size of antiderivative = 2.21

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \frac{\frac{3ab\sqrt{1-c^2x^2}}{-1+cx} + \frac{3ab\sqrt{1-c^2x^2}}{1+cx} - \frac{3a^2}{-1+c^2x^2} + 12iab\pi\arcsin(cx) - \frac{3ab\arcsin(cx)}{-1+cx} + \frac{3ab\arcsin(cx)}{1+cx} - \frac{6b^2cx\arcsin(cx)}{\sqrt{1-c^2x^2}} - 6iab\arc}{}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] ((3*a*b*Sqrt[1 - c^2*x^2])/(-1 + c*x) + (3*a*b*Sqrt[1 - c^2*x^2])/(1 + c*x)
 - (3*a^2)/(-1 + c^2*x^2) + (12*I)*a*b*Pi*ArcSin[c*x] - (3*a*b*ArcSin[c*x])
/(-1 + c*x) + (3*a*b*ArcSin[c*x])/(1 + c*x) - (6*b^2*c*x*ArcSin[c*x])/Sqrt[
1 - c^2*x^2] - (6*I)*a*b*ArcSin[c*x]^2 + (3*b^2*ArcSin[c*x]^2)/(1 - c^2*x^2
) - (2*I)*b^2*ArcSin[c*x]^3 + 24*a*b*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 6*a
*b*Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 12*a*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcS
in[c*x])] - 6*a*b*Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 12*a*b*ArcSin[c*x]*Log[
1 + I*E^(I*ArcSin[c*x])] + 6*b^2*ArcSin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x]
)] + 3*a^2*Log[1 - c^2*x^2] - 3*b^2*Log[1 - c^2*x^2] - 24*a*b*Pi*Log[Cos[Ar
cSin[c*x]/2]] + 6*a*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 6*a*b*Pi*Log[S
in[(Pi + 2*ArcSin[c*x])/4]] - (12*I)*a*b*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]
 - (12*I)*a*b*PolyLog[2, I*E^(I*ArcSin[c*x])] - (6*I)*b^2*ArcSin[c*x]*PolyL
og[2, -E^((2*I)*ArcSin[c*x])] + 3*b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(
6*c^4*d^2)
```

Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 364, normalized size of antiderivative = 1.60

method	result
derivativedivides	$\frac{a^2\left(-\frac{1}{4(cx-1)}+\frac{\ln(cx-1)}{2}+\frac{1}{4cx+4}+\frac{\ln(cx+1)}{2}\right)}{d^2}+\frac{b^2\left(-\frac{i\arcsin(cx)^3}{3}-\frac{\left(2ic^2x^2-2cx\sqrt{-c^2x^2+1}+\arcsin(cx)-2i\right)\arcsin(cx)}{2\left(c^2x^2-1\right)}+\arcsin\right.}{}$
default	$\frac{a^2\left(-\frac{1}{4(cx-1)}+\frac{\ln(cx-1)}{2}+\frac{1}{4cx+4}+\frac{\ln(cx+1)}{2}\right)}{d^2}+\frac{b^2\left(-\frac{i\arcsin(cx)^3}{3}-\frac{\left(2ic^2x^2-2cx\sqrt{-c^2x^2+1}+\arcsin(cx)-2i\right)\arcsin(cx)}{2\left(c^2x^2-1\right)}+\arcsin\right.}{}$
parts	$\frac{a^2\left(-\frac{1}{4c^4(cx-1)}+\frac{\ln(cx-1)}{2c^4}+\frac{1}{4c^4(cx+1)}+\frac{\ln(cx+1)}{2c^4}\right)}{d^2}+\frac{b^2\left(-\frac{i\arcsin(cx)^3}{3}-\frac{\left(2ic^2x^2-2cx\sqrt{-c^2x^2+1}+\arcsin(cx)-2i\right)\arcsin(}{2\left(c^2x^2-1\right)}\right.}{}$

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(a^2/d^2*(-1/4/(c*x-1)+1/2*ln(c*x-1)+1/4/(c*x+1)+1/2*ln(c*x+1))+b^2/d
^2*(-1/3*I*arcsin(c*x)^3-1/2*(2*I*c^2*x^2-2*c*x*(-c^2*x^2+1)^(1/2)+arcsin(c
*x)-2*I)*arcsin(c*x)/(c^2*x^2-1)+arcsin(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/
2))^2)-I*arcsin(c*x)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*polylog(3
,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*ln(I*c
*x+(-c^2*x^2+1)^(1/2)))+2*a*b/d^2*(-1/2*I*arcsin(c*x)^2-1/2*(I*c^2*x^2-c*x*
(-c^2*x^2+1)^(1/2)+arcsin(c*x)-I)/(c^2*x^2-1)+arcsin(c*x)*ln(1+(I*c*x+(-c^2
*x^2+1)^(1/2))^2)-1/2*I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)))
```

Fricas [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx=\int \frac{(b\arcsin(cx)+a)^2x^3}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3)/(c^4*d^2
*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx=\frac{\int \frac{a^2x^3}{c^4x^4-2c^2x^2+1}\,dx+\int \frac{b^2x^3\operatorname{asin}^2(cx)}{c^4x^4-2c^2x^2+1}\,dx+\int \frac{2abx^3\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2*x**3/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x**3*
asin(c*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x**3*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Maxima [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2x^3}{(c^2dx^2-d)^2}\,dx$$

[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")

[Out] -1/2*a^2*(1/(c^6*d^2*x^2 - c^4*d^2) - log(c^2*x^2 - 1)/(c^4*d^2)) - 1/2*(b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 - (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*(c^6*d^2*x^2 - c^4*d^2)*integrate((2*a*b*c^3*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^7*d^2*x^4 - 2*c^5*d^2*x^2 + c^3*d^2), x))/(c^6*d^2*x^2 - c^4*d^2)

Giac [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2x^3}{(c^2dx^2-d)^2}\,dx$$

[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)^2*x^3/(c^2*d*x^2 - d)^2, x)

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{x^3\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^2}\,dx$$

[In] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2,x)

[Out] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2, x)

3.194 $\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 233

$$\begin{aligned}\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx &= -\frac{b(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}}+\frac{x(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)}\\&\quad+\frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d^2}+\frac{b^2\text{arctanh}(cx)}{c^3d^2}\\&\quad-\frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^3d^2}\\&\quad+\frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^3d^2}\\&\quad+\frac{b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{c^3d^2}-\frac{b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{c^3d^2}\end{aligned}$$

```
[Out] 1/2*x*(a+b*arcsin(c*x))^2/c^2/d^2/(-c^2*x^2+1)+I*(a+b*arcsin(c*x))^2*arctan
(I*c*x+(-c^2*x^2+1)^(1/2))/c^3/d^2+b^2*arctanh(c*x)/c^3/d^2-I*b*(a+b*arcsin
(c*x))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d^2+I*b*(a+b*arcsin(c*x
))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d^2+b^2*polylog(3,-I*(I*c*x+
(-c^2*x^2+1)^(1/2)))/c^3/d^2-b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^
3/d^2-b*(a+b*arcsin(c*x))/c^3/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 233, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4791, 4749, 4266, 2611, 2320, 6724, 4767, 212}

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \frac{i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{c^3d^2} - \frac{ib\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^3d^2} + \frac{ib\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^3d^2} + \frac{x(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{b(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{c^3d^2} - \frac{b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{c^3d^2} + \frac{b^2\operatorname{arctanh}(cx)}{c^3d^2}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((b*(a + b*ArcSin[c*x]))/(c^3*d^2*Sqrt[1 - c^2*x^2])) + (x*(a + b*ArcSin[c
*x])^2)/(2*c^2*d^2*(1 - c^2*x^2)) + (I*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*Ar
cSin[c*x])])/(c^3*d^2) + (b^2*ArcTanh[c*x])/(c^3*d^2) - (I*b*(a + b*ArcSin[
c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^2) + (I*b*(a + b*ArcSin[c*
x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^3*d^2) + (b^2*PolyLog[3, (-I)*E^(I*
ArcSin[c*x])])/(c^3*d^2) - (b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c^3*d^2)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
```

```
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{x(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{b\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{cd^2} - \frac{\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{2c^2d}$$

$$= -\frac{b(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{\text{Subst}\left(\int (a+bx)^2\sec(x)\,dx, x, \arcsin(cx)\right)}{2c^3d^2} + \frac{b^2\int \frac{1}{1-c^2x^2}\,dx}{c^2d^2}$$

$$= -\frac{b(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d^2} + \frac{b^2\text{arctanh}(cx)}{c^3d^2} + \frac{b\text{Subst}\left(\int (a+bx)\log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^3d^2} - \frac{b\text{Subst}\left(\int (a+bx)\log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^3d^2}$$

$$= -\frac{b(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d^2} + \frac{b^2\text{arctanh}(cx)}{c^3d^2} - \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^3d^2} + \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^3d^2} + \frac{(ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^3d^2} - \frac{(ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^3d^2}$$

$$= -\frac{b(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d^2} + \frac{b^2\text{arctanh}(cx)}{c^3d^2} - \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^3d^2} + \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^3d^2} + \frac{b^2\text{Subst}\left(\int \frac{\text{PolyLog}(2,-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{c^3d^2} - \frac{b^2\text{Subst}\left(\int \frac{\text{PolyLog}(2,ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{c^3d^2}$$

$$
\begin{aligned}
&= -\frac{b(a+b\arcsin(cx))}{c^3d^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} \\
&\quad + \frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{c^3d^2} + \frac{b^2\text{arctanh}(cx)}{c^3d^2} \\
&\quad - \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^3d^2} \\
&\quad + \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^3d^2} \\
&\quad + \frac{b^2\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{c^3d^2} - \frac{b^2\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{c^3d^2}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 2.03 (sec) , antiderivative size = 457, normalized size of antiderivative = 1.96

$$
\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx
$$

$$
= \frac{\frac{2ab\sqrt{1-c^2x^2}}{-1+cx} - \frac{2ab\sqrt{1-c^2x^2}}{1+cx} - \frac{2a^2cx}{-1+c^2x^2} + 2iab\pi\arcsin(cx) - \frac{2ab\arcsin(cx)}{-1+cx} - \frac{2ab\arcsin(cx)}{1+cx} - \frac{4b^2\arcsin(cx)}{\sqrt{1-c^2x^2}} + \frac{2b^2cx\arcsin}{1-c^2x^2}
$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] ((2*a*b*Sqrt[1 - c^2*x^2])/(-1 + c*x) - (2*a*b*Sqrt[1 - c^2*x^2])/(1 + c*x)
 - (2*a^2*c*x)/(-1 + c^2*x^2) + (2*I)*a*b*Pi*ArcSin[c*x] - (2*a*b*ArcSin[c*
x])/(-1 + c*x) - (2*a*b*ArcSin[c*x])/(1 + c*x) - (4*b^2*ArcSin[c*x])/Sqrt[1
 - c^2*x^2] + (2*b^2*c*x*ArcSin[c*x]^2)/(1 - c^2*x^2) + (4*I)*b^2*ArcSin[c*
x]^2*ArcTan[E^(I*ArcSin[c*x])] + 4*b^2*ArcTanh[c*x] - 2*a*b*Pi*Log[1 - I*E^
(I*ArcSin[c*x])] - 4*a*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*a*b*P
i*Log[1 + I*E^(I*ArcSin[c*x])] + 4*a*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*
x])] + a^2*Log[1 - c*x] - a^2*Log[1 + c*x] + 2*a*b*Pi*Log[-Cos[(Pi + 2*ArcS
in[c*x])/4]] + 2*a*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (4*I)*b*(a + b*A
rcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (4*I)*b*(a + b*ArcSin[c*x]
)*PolyLog[2, I*E^(I*ArcSin[c*x])] + 4*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])
] - 4*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(4*c^3*d^2)
```

Maple [A] (verified)

Time = 0.33 (sec) , antiderivative size = 446, normalized size of antiderivative = 1.91

method	result
derivativedivides	$\frac{a^2\left(-\frac{1}{4(cx-1)}+\frac{\ln(cx-1)}{4}-\frac{1}{4(cx+1)}-\frac{\ln(cx+1)}{4}\right)}{d^2}+\frac{b^2\left(-\frac{\arcsin(cx)\left(cx\arcsin(cx)-2\sqrt{-c^2x^2+1}\right)}{2(c^2x^2-1)}+\frac{\arcsin(cx)^2\ln\left(1+i\left(icx+\sqrt{-c^2x^2\right.\right.}}{2}\right.}{}$
default	$\frac{a^2\left(-\frac{1}{4(cx-1)}+\frac{\ln(cx-1)}{4}-\frac{1}{4(cx+1)}-\frac{\ln(cx+1)}{4}\right)}{d^2}+\frac{b^2\left(-\frac{\arcsin(cx)\left(cx\arcsin(cx)-2\sqrt{-c^2x^2+1}\right)}{2(c^2x^2-1)}+\frac{\arcsin(cx)^2\ln\left(1+i\left(icx+\sqrt{-c^2x^2\right.\right.}}{2}\right.}{}$
parts	$\frac{a^2\left(-\frac{1}{4c^3(cx-1)}+\frac{\ln(cx-1)}{4c^3}-\frac{1}{4c^3(cx+1)}-\frac{\ln(cx+1)}{4c^3}\right)}{d^2}+\frac{b^2\left(-\frac{\arcsin(cx)\left(cx\arcsin(cx)-2\sqrt{-c^2x^2+1}\right)}{2(c^2x^2-1)}+\frac{\arcsin(cx)^2\ln\left(1+i\left(icx+\right.\right.}{2}\right.}{}$

[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)

[Out] 1/c^3*(a^2/d^2*(-1/4/(c*x-1)+1/4*ln(c*x-1)-1/4/(c*x+1)-1/4*ln(c*x+1))+b^2/d^2*(-1/2/(c^2*x^2-1)*arcsin(c*x)*(c*x*arcsin(c*x)-2*(-c^2*x^2+1)^(1/2))+1/2*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-I*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*arctan(I*c*x+(-c^2*x^2+1)^(1/2)))+2*a*b/d^2*(-1/2*(c*x*arcsin(c*x)-(-c^2*x^2+1)^(1/2))/(c^2*x^2-1)+1/2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/2*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/2*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^2}{(c^2dx^2-d)^2}\,dx$$

[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")

[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \frac{\int \frac{a^2x^2}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{b^2x^2\operatorname{asin}^2(cx)}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{2abx^2\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)

[Out] (Integral(a**2*x**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x**2*asin(c*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x**2*asin(c*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2

Maxima [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^2}{(c^2dx^2-d)^2}\,dx$$

[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")

[Out] -1/4*a^2*(2*x/(c^4*d^2*x^2 - c^2*d^2) + log(c*x + 1)/(c^3*d^2) - log(c*x - 1)/(c^3*d^2)) - 1/4*(2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) + 4*(c^5*d^2*x^2 - c^3*d^2)*integrate(-1/2*(4*a*b*c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^2*x^4 - 2*c^4*d^2*x^2 + c^2*d^2), x))/(c^5*d^2*x^2 - c^3*d^2)

Giac [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^2}{(c^2dx^2-d)^2}\,dx$$

[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)^2*x^2/(c^2*d*x^2 - d)^2, x)

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^2}\,dx$$

[In] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2,x)

[Out] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2, x)

3.195 $\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 89

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = -\frac{bx(a+b\arcsin(cx))}{cd^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{b^2\log(1-c^2x^2)}{2c^2d^2}$$

```
[Out] 1/2*(a+b*arcsin(c*x))^2/c^2/d^2/(-c^2*x^2+1)-1/2*b^2*ln(-c^2*x^2+1)/c^2/d^2
-b*x*(a+b*arcsin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {4767, 4745, 266}

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = -\frac{bx(a+b\arcsin(cx))}{cd^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{b^2\log(1-c^2x^2)}{2c^2d^2}$$

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((b*x*(a + b*ArcSin[c*x]))/(c*d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*x]
)^2/(2*c^2*d^2*(1 - c^2*x^2)) - (b^2*Log[1 - c^2*x^2])/(2*c^2*d^2)
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{b\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^{3/2}}\,dx}{cd^2} \\
&= -\frac{bx(a+b\arcsin(cx))}{cd^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} + \frac{b^2\int \frac{x}{1-c^2x^2}\,dx}{d^2} \\
&= -\frac{bx(a+b\arcsin(cx))}{cd^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2c^2d^2(1-c^2x^2)} - \frac{b^2\log(1-c^2x^2)}{2c^2d^2}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.84

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = -\frac{\frac{2bcx(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{-1+c^2x^2} + b^2\log(1-c^2x^2)}{2c^2d^2}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
[Out] -1/2*((2*b*c*x*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2] + (a + b*ArcSin[c*x])
^2/(-1 + c^2*x^2) + b^2*Log[1 - c^2*x^2])/(c^2*d^2)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 171 vs. $2(83) = 166$.

Time = 0.11 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.93

method	result
derivativedivides	$\frac{-\frac{a^2}{2d^2(c^2x^2-1)}+\frac{b^2\left(-\frac{\arcsin(cx)^2}{2(c^2x^2-1)}+\frac{\sqrt{-c^2x^2+1}\,\arcsin(cx)cx}{c^2x^2-1}-\frac{\ln(-c^2x^2+1)}{2}\right)}{d^2}+\frac{2ab\left(-\frac{\arcsin(cx)}{2(c^2x^2-1)}+\frac{\sqrt{-(cx-1)^2-2cx+2}}{4cx-4}+\sqrt{-(\cdots}\right.}{d^2}}{c^2}$
default	$\frac{-\frac{a^2}{2d^2(c^2x^2-1)}+\frac{b^2\left(-\frac{\arcsin(cx)^2}{2(c^2x^2-1)}+\frac{\sqrt{-c^2x^2+1}\,\arcsin(cx)cx}{c^2x^2-1}-\frac{\ln(-c^2x^2+1)}{2}\right)}{d^2}+\frac{2ab\left(-\frac{\arcsin(cx)}{2(c^2x^2-1)}+\frac{\sqrt{-(cx-1)^2-2cx+2}}{4cx-4}+\sqrt{-(\cdots}\right.}{d^2}}{c^2}$
parts	$-\frac{a^2}{2d^2c^2(c^2x^2-1)}+\frac{b^2\left(-\frac{\arcsin(cx)^2}{2(c^2x^2-1)}+\frac{\sqrt{-c^2x^2+1}\,\arcsin(cx)cx}{c^2x^2-1}-\frac{\ln(-c^2x^2+1)}{2}\right)}{d^2c^2}+\frac{2ab\left(-\frac{\arcsin(cx)}{2(c^2x^2-1)}+\frac{\sqrt{-(cx-1)^2-2cx\cdots}}{4cx-4}\right.}{d^2c^2}$

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(-1/2*a^2/d^2/(c^2*x^2-1)+b^2/d^2*(-1/2/(c^2*x^2-1)*arcsin(c*x)^2+(-c
^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c*x-1/2*ln(-c^2*x^2+1))+2*a*b/d^2*(
-1/2/(c^2*x^2-1)*arcsin(c*x)+1/4/(c*x-1)*(-(c*x-1)^2-2*c*x+2)^(1/2)+1/4/(c*
x+1)*(-(c*x+1)^2+2*c*x+2)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 102, normalized size of antiderivative = 1.15

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = -\frac{b^2\arcsin(cx)^2+2\,ab\arcsin(cx)+a^2+(b^2c^2x^2-b^2)\log(c^2x^2-1)-2\,(b^2cx\arcsin(cx)+abcx)\sqrt{-c^2x^2\cdots}}{2\,(c^4d^2x^2-c^2d^2)}$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] -1/2*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2 + (b^2*c^2*x^2 - b^2)*log
(c^2*x^2 - 1) - 2*(b^2*c*x*arcsin(c*x) + a*b*c*x)*sqrt(-c^2*x^2 + 1))/(c^4*
d^2*x^2 - c^2*d^2)
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \frac{\int \frac{a^2x}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{b^2x\,\mathrm{asin}^2\,(cx)}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{2abx\,\mathrm{asin}\,(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2*x/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x*asin(c
*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x*asin(c*x)/(c**4
*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 293 vs. 2(82) = 164.

Time = 0.30 (sec) , antiderivative size = 293, normalized size of antiderivative = 3.29

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx$$
$$= \frac{1}{2}\left(\left(\frac{\sqrt{-c^2x^2+1}c^2d^2}{c^7d^4x+c^6d^4} + \frac{\sqrt{-c^2x^2+1}c^2d^2}{c^7d^4x-c^6d^4}\right)c^2 - \frac{2\arcsin(cx)}{c^4d^2x^2-c^2d^2}\right)ab$$
$$-\frac{1}{2}\left(c^3\left(\frac{\log(cx+1)}{c^5d^2} + \frac{\log(cx-1)}{c^5d^2}\right) - \left(\frac{\sqrt{-c^2x^2+1}c^2d^2}{c^7d^4x+c^6d^4} + \frac{\sqrt{-c^2x^2+1}c^2d^2}{c^7d^4x-c^6d^4}\right)c^2\arcsin(cx)\right)b^2$$
$$-\frac{b^2\arcsin(cx)^2}{2(c^4d^2x^2-c^2d^2)} - \frac{a^2}{2(c^4d^2x^2-c^2d^2)}$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*((sqrt(-c^2*x^2 + 1)*c^2*d^2/(c^7*d^4*x + c^6*d^4) + sqrt(-c^2*x^2 + 1)
*c^2*d^2/(c^7*d^4*x - c^6*d^4))*c^2 - 2*arcsin(c*x)/(c^4*d^2*x^2 - c^2*d^2)
)*a*b - 1/2*(c^3*(log(c*x + 1)/(c^5*d^2) + log(c*x - 1)/(c^5*d^2)) - (sqrt(
-c^2*x^2 + 1)*c^2*d^2/(c^7*d^4*x + c^6*d^4) + sqrt(-c^2*x^2 + 1)*c^2*d^2/(c
^7*d^4*x - c^6*d^4))*c^2*arcsin(c*x))*b^2 - 1/2*b^2*arcsin(c*x)^2/(c^4*d^2*
x^2 - c^2*d^2) - 1/2*a^2/(c^4*d^2*x^2 - c^2*d^2)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 204 vs. $2(82) = 164$.

Time = 0.32 (sec) , antiderivative size = 204, normalized size of antiderivative = 2.29

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = -\frac{b^2x^2\arcsin(cx)^2}{2(c^2x^2-1)d^2} - \frac{abx^2\arcsin(cx)}{(c^2x^2-1)d^2} - \frac{a^2x^2}{2(c^2x^2-1)d^2} - \frac{b^2x\arcsin(cx)}{\sqrt{-c^2x^2+1}cd^2} + \frac{b^2\arcsin(cx)^2}{2c^2d^2} - \frac{abx}{\sqrt{-c^2x^2+1}cd^2} + \frac{ab\arcsin(cx)}{c^2d^2} - \frac{b^2\log(2)}{c^2d^2} - \frac{b^2\log(|-c^2x^2+1|)}{2c^2d^2} + \frac{a^2}{2c^2d^2}$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] -1/2*b^2*x^2*arcsin(c*x)^2/((c^2*x^2 - 1)*d^2) - a*b*x^2*arcsin(c*x)/((c^2*
x^2 - 1)*d^2) - 1/2*a^2*x^2/((c^2*x^2 - 1)*d^2) - b^2*x*arcsin(c*x)/(sqrt(-
c^2*x^2 + 1)*c*d^2) + 1/2*b^2*arcsin(c*x)^2/(c^2*d^2) - a*b*x/(sqrt(-c^2*x^
2 + 1)*c*d^2) + a*b*arcsin(c*x)/(c^2*d^2) - b^2*log(2)/(c^2*d^2) - 1/2*b^2*
log(abs(-c^2*x^2 + 1))/(c^2*d^2) + 1/2*a^2/(c^2*d^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{x\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^2}\,dx$$

```
[In] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2,x)
```

```
[Out] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2, x)
```

3.196 $\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 230

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx &= -\frac{b(a+b\arcsin(cx))}{cd^2\sqrt{1-c^2x^2}}+\frac{x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)}\\ &\quad-\frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{cd^2}+\frac{b^2\text{arctanh}(cx)}{cd^2}\\ &\quad+\frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{cd^2}\\ &\quad-\frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{cd^2}\\ &\quad-\frac{b^2\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{cd^2}+\frac{b^2\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{cd^2}\end{aligned}$$

```
[Out] 1/2*x*(a+b*arcsin(c*x))^2/d^2/(-c^2*x^2+1)-I*(a+b*arcsin(c*x))^2*arctan(I*c
*x+(-c^2*x^2+1)^(1/2))/c/d^2+b^2*arctanh(c*x)/c/d^2+I*b*(a+b*arcsin(c*x))*p
olylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2-I*b*(a+b*arcsin(c*x))*polylog
(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2-b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)
^(1/2)))/c/d^2+b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2-b*(a+b*arc
sin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 230, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4747, 4749, 4266, 2611, 2320, 6724, 4767, 212}

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = -\frac{i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{cd^2} - \frac{b(a+b\arcsin(cx))}{cd^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} + \frac{ib\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{cd^2} - \frac{ib\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{cd^2} - \frac{b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{cd^2} + \frac{b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{cd^2} + \frac{b^2\operatorname{arctanh}(cx)}{cd^2}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((b*(a + b*ArcSin[c*x]))/(c*d^2*Sqrt[1 - c^2*x^2])) + (x*(a + b*ArcSin[c*x
])^2)/(2*d^2*(1 - c^2*x^2)) - (I*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c
*x])])/(c*d^2) + (b^2*ArcTanh[c*x])/(c*d^2) + (I*b*(a + b*ArcSin[c*x])*Poly
Log[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^2) - (I*b*(a + b*ArcSin[c*x])*PolyLog[
2, I*E^(I*ArcSin[c*x])])/(c*d^2) - (b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])
/(c*d^2) + (b^2*PolyLog[3, I*E^(I*ArcSin[c*x])])/(c*d^2)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
```

```
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{(bc)\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{d^2} + \frac{\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{2d}$$

$$= -\frac{b(a+b\arcsin(cx))}{cd^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} + \frac{b^2\int\frac{1}{1-c^2x^2}\,dx}{d^2} + \frac{\text{Subst}\left(\int(a+bx)^2\sec(x)\,dx,x,\arcsin(cx)\right)}{2cd^2}$$

$$= -\frac{b(a+b\arcsin(cx))}{cd^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{cd^2} + \frac{b^2\text{arctanh}(cx)}{cd^2} - \frac{b\text{Subst}\left(\int(a+bx)\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{cd^2} + \frac{b\text{Subst}\left(\int(a+bx)\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{cd^2}$$

$$= -\frac{b(a+b\arcsin(cx))}{cd^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{cd^2} + \frac{b^2\text{arctanh}(cx)}{cd^2} + \frac{ib(a+b\arcsin(cx))\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{cd^2} - \frac{ib(a+b\arcsin(cx))\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{cd^2} - \frac{(ib^2)\text{Subst}\left(\int\text{PolyLog}\left(2,-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{cd^2} + \frac{(ib^2)\text{Subst}\left(\int\text{PolyLog}\left(2,ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{cd^2}$$

$$= -\frac{b(a+b\arcsin(cx))}{cd^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{cd^2} + \frac{b^2\text{arctanh}(cx)}{cd^2} + \frac{ib(a+b\arcsin(cx))\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{cd^2} - \frac{ib(a+b\arcsin(cx))\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{cd^2} - \frac{b^2\text{Subst}\left(\int\frac{\text{PolyLog}(2,-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{cd^2} + \frac{b^2\text{Subst}\left(\int\frac{\text{PolyLog}(2,ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{cd^2}$$

$$= -\frac{b(a+b\arcsin(cx))}{cd^2\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{cd^2} + \frac{b^2\operatorname{arctanh}(cx)}{cd^2} + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{cd^2} - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{cd^2} - \frac{b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{cd^2} + \frac{b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{cd^2}$$

Mathematica [A] (verified)

Time = 1.88 (sec) , antiderivative size = 458, normalized size of antiderivative = 1.99

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx$$

$$= \frac{-\frac{2a^2x}{-1+c^2x^2} - \frac{a^2\log(1-cx)}{c} + \frac{a^2\log(1+cx)}{c} + \frac{2ab\left(\frac{\sqrt{1-c^2x^2}}{-1+cx} - \frac{\sqrt{1-c^2x^2}}{1+cx} - i\pi\arcsin(cx) + \frac{\arcsin(cx)}{1-cx} - \frac{\arcsin(cx)}{1+cx} + \pi\log\left(1-ie^{i\arcsin(cx)}\right) + 2a\cdots\right.}{}}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^2,x]
```

```
[Out] ((-2*a^2*x)/(-1 + c^2*x^2) - (a^2*Log[1 - c*x])/c + (a^2*Log[1 + c*x])/c +
(2*a*b*(Sqrt[1 - c^2*x^2]/(-1 + c*x) - Sqrt[1 - c^2*x^2]/(1 + c*x) - I*Pi*A
rcSin[c*x] + ArcSin[c*x]/(1 - c*x) - ArcSin[c*x]/(1 + c*x) + Pi*Log[1 - I*E
^(I*ArcSin[c*x])] + 2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + Pi*Log[1 +
 I*E^(I*ArcSin[c*x])] - 2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - Pi*Log
[-Cos[(Pi + 2*ArcSin[c*x])/4]] - Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (2*I
)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (2*I)*PolyLog[2, I*E^(I*ArcSin[c*x])
]))/c + (4*b^2*(-(ArcSin[c*x]/Sqrt[1 - c^2*x^2]) + (c*x*ArcSin[c*x]^2)/(2 -
 2*c^2*x^2) - I*ArcSin[c*x]^2*ArcTan[E^(I*ArcSin[c*x])] + ArcTanh[c*x] + I*
ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - I*ArcSin[c*x]*PolyLog[2, I
*E^(I*ArcSin[c*x])] - PolyLog[3, (-I)*E^(I*ArcSin[c*x])] + PolyLog[3, I*E^(
I*ArcSin[c*x])]))/c)/(4*d^2)
```

Maple [A] (verified)

Time = 0.30 (sec) , antiderivative size = 446, normalized size of antiderivative = 1.94

method	result
derivativedivides	$\frac{a^2\left(-\frac{1}{4(cx-1)}-\frac{\ln(cx-1)}{4}-\frac{1}{4(cx+1)}+\frac{\ln(cx+1)}{4}\right)}{d^2}+\frac{b^2\left(-\frac{\arcsin(cx)\left(cx\arcsin(cx)-2\sqrt{-c^2x^2+1}\right)}{2\left(c^2x^2-1\right)}-\frac{\arcsin(cx)^2\ln\left(1+i\left(icx+\sqrt{-c^2x^2\right.\right.}{2}}{}$
default	$\frac{a^2\left(-\frac{1}{4(cx-1)}-\frac{\ln(cx-1)}{4}-\frac{1}{4(cx+1)}+\frac{\ln(cx+1)}{4}\right)}{d^2}+\frac{b^2\left(-\frac{\arcsin(cx)\left(cx\arcsin(cx)-2\sqrt{-c^2x^2+1}\right)}{2\left(c^2x^2-1\right)}-\frac{\arcsin(cx)^2\ln\left(1+i\left(icx+\sqrt{-c^2x^2\right.\right.}{2}}{}$
parts	$\frac{a^2\left(-\frac{1}{4c(cx-1)}-\frac{\ln(cx-1)}{4c}-\frac{1}{4c(cx+1)}+\frac{\ln(cx+1)}{4c}\right)}{d^2}+\frac{b^2\left(-\frac{\arcsin(cx)\left(cx\arcsin(cx)-2\sqrt{-c^2x^2+1}\right)}{2\left(c^2x^2-1\right)}-\frac{\arcsin(cx)^2\ln\left(1+i\left(icx+\sqrt{\right.\right.}{2}}{}$

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a^2/d^2*(-1/4/(c*x-1)-1/4*ln(c*x-1)-1/4/(c*x+1)+1/4*ln(c*x+1))+b^2/d^2
*(-1/2/(c^2*x^2-1)*arcsin(c*x)*(c*x*arcsin(c*x)-2*(-c^2*x^2+1)^(1/2))-1/2*a
rcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*arcsin(c*x)*polylog(2,-I*
(I*c*x+(-c^2*x^2+1)^(1/2)))-polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/2*ar
csin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-I*arcsin(c*x)*polylog(2,I*(I
*c*x+(-c^2*x^2+1)^(1/2)))+polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*arcta
n(I*c*x+(-c^2*x^2+1)^(1/2)))+2*a*b/d^2*(-1/2*(c*x*arcsin(c*x)-(-c^2*x^2+1)^
(1/2))/(c^2*x^2-1)-1/2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/2*a
rcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/2*I*dilog(1+I*(I*c*x+(-c^2*
x^2+1)^(1/2)))-1/2*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx=\int \frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^4 - 2*c^2
*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \frac{\int \frac{a^2}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{b^2\,\mathrm{asin}^2\,(cx)}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{2ab\,\mathrm{asin}\,(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*asin(c*x)*
*2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*asin(c*x)/(c**4*x**4
- 2*c**2*x**2 + 1), x))/d**2
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*(2*x/(c^2*d^2*x^2 - d^2) - log(c*x + 1)/(c*d^2) + log(c*x - 1)/(c*
d^2)) - 1/4*(2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 - (b^2*
c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) +
(b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x +
 1) - 4*(c^3*d^2*x^2 - c*d^2)*integrate(1/2*(4*a*b*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)) - (2*b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
- (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x +
1) + (b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*
x + 1))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2),
x))/(c^3*d^2*x^2 - c*d^2)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(c^2*d*x^2 - d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx=\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\left(d-c^2\,d\,x^2\right)^2}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^2,x)
[Out] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^2, x)
```

3.197 $\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 211

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^2}\,dx = &-\frac{bcx(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}}+\frac{(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)}\\ &-\frac{2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2}-\frac{b^2\log(1-c^2x^2)}{2d^2}\\ &+\frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^2}\\ &-\frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2}\\ &-\frac{b^2\,\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d^2}+\frac{b^2\,\text{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d^2}\end{aligned}$$

```
[Out] 1/2*(a+b*arcsin(c*x))^2/d^2/(-c^2*x^2+1)-2*(a+b*arcsin(c*x))^2*arctanh((I*c
*x+(-c^2*x^2+1)^(1/2))^2)/d^2-1/2*b^2*ln(-c^2*x^2+1)/d^2+I*b*(a+b*arcsin(c*
x))*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-I*b*(a+b*arcsin(c*x))*poly
log(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2
+1)^(1/2))^2)/d^2+1/2*b^2*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-b*c*x
*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 211, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4793, 4769, 4504, 4268, 2611, 2320, 6724, 4745, 266}

$$\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^2}\,dx = -\frac{2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{d^2} - \frac{bcx(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} + \frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2} - \frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2} - \frac{b^2\,\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d^2} + \frac{b^2\,\text{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d^2} - \frac{b^2\log(1-c^2x^2)}{2d^2}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^2),x]
```

```
[Out] -((b*c*x*(a + b*ArcSin[c*x]))/(d^2*Sqrt[1 - c^2*x^2])) + (a + b*ArcSin[c*x]
)^2/(2*d^2*(1 - c^2*x^2)) - (2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSi
n[c*x])])/d^2 - (b^2*Log[1 - c^2*x^2])/(2*d^2) + (I*b*(a + b*ArcSin[c*x])*P
olyLog[2, -E^((2*I)*ArcSin[c*x])])/d^2 - (I*b*(a + b*ArcSin[c*x])*PolyLog[2
, E^((2*I)*ArcSin[c*x])])/d^2 - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2
*d^2) + (b^2*PolyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d^2)
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
```

```
- 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{(bc)\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^{3/2}}\,dx}{d^2} + \frac{\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)}\,dx}{d}$$

$$= -\frac{bcx(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} + \frac{\text{Subst}\left(\int (a+bx)^2\csc(x)\sec(x)\,dx, x, \arcsin(cx)\right)}{d^2} + \frac{(b^2c^2)\int \frac{x}{1-c^2x^2}\,dx}{d^2}$$

$$= -\frac{bcx(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{b^2\log(1-c^2x^2)}{2d^2} + \frac{2\text{Subst}\left(\int (a+bx)^2\csc(2x)\,dx, x, \arcsin(cx)\right)}{d^2}$$

$$= -\frac{bcx(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2} - \frac{b^2\log(1-c^2x^2)}{2d^2} - \frac{(2b)\text{Subst}\left(\int (a+bx)\log(1-e^{2ix})\,dx, x, \arcsin(cx)\right)}{d^2} + \frac{(2b)\text{Subst}\left(\int (a+bx)\log(1+e^{2ix})\,dx, x, \arcsin(cx)\right)}{d^2}$$

$$= -\frac{bcx(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2} - \frac{b^2\log(1-c^2x^2)}{2d^2} + \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^2} - \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2} - \frac{(ib^2)\,\text{Subst}\left(\int \text{PolyLog}(2,-e^{2ix})\,dx, x, \arcsin(cx)\right)}{d^2} + \frac{(ib^2)\,\text{Subst}\left(\int \text{PolyLog}(2,e^{2ix})\,dx, x, \arcsin(cx)\right)}{d^2}$$

$$= -\frac{bcx(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2} - \frac{b^2\log(1-c^2x^2)}{2d^2} + \frac{ib(a+b\arcsin(cx))\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^2} - \frac{ib(a+b\arcsin(cx))\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2} - \frac{b^2\text{Subst}\left(\int \frac{\text{PolyLog}(2,-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{2d^2} + \frac{b^2\text{Subst}\left(\int \frac{\text{PolyLog}(2,x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{2d^2}$$

$$= -\frac{bcx(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2} - \frac{b^2\log(1-c^2x^2)}{2d^2} + \frac{ib(a+b\arcsin(cx))\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^2} - \frac{ib(a+b\arcsin(cx))\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2} - \frac{b^2\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d^2} + \frac{b^2\text{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d^2}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 612 vs. 2(211) = 422.

Time = 1.98 (sec) , antiderivative size = 612, normalized size of antiderivative = 2.90

$$\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^2}\,dx = \frac{-\frac{1}{12}ib^2\pi^3 + \frac{a^2}{1-c^2x^2} + \frac{ab\sqrt{1-c^2x^2}}{-1+cx} + \frac{ab\sqrt{1-c^2x^2}}{1+cx} - 4iab\pi\arcsin(cx) + \frac{ab\arcsin(cx)}{1-cx} + \frac{ab\arcsin(cx)}{1+cx} - \frac{2b^2cx\arcsin(cx)}{\sqrt{1-c^2x^2}} +}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^2),x]
```

```
[Out] ((-1/12*I)*b^2*Pi^3 + a^2/(1 - c^2*x^2) + (a*b*Sqrt[1 - c^2*x^2])/(-1 + c*x
) + (a*b*Sqrt[1 - c^2*x^2])/(1 + c*x) - (4*I)*a*b*Pi*ArcSin[c*x] + (a*b*Arc
Sin[c*x])/(1 - c*x) + (a*b*ArcSin[c*x])/(1 + c*x) - (2*b^2*c*x*ArcSin[c*x])
/Sqrt[1 - c^2*x^2] + (b^2*ArcSin[c*x]^2)/(1 - c^2*x^2) + ((4*I)/3)*b^2*ArcS
in[c*x]^3 - 8*a*b*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*a*b*Pi*Log[1 - I*E^(
I*ArcSin[c*x])] - 4*a*b*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*a*b*Pi
```

```
*Log[1 + I*E^(I*ArcSin[c*x])] - 4*a*b*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x
])] + 2*b^2*ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] + 4*a*b*ArcSin[c*
x]*Log[1 - E^((2*I)*ArcSin[c*x])] - 2*b^2*ArcSin[c*x]^2*Log[1 + E^((2*I)*Ar
cSin[c*x])] + 2*a^2*Log[c*x] - a^2*Log[1 - c^2*x^2] - b^2*Log[1 - c^2*x^2]
+ 8*a*b*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*a*b*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])
/4]] + 2*a*b*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*a*b*PolyLog[2, (-I
)*E^(I*ArcSin[c*x])] + (4*I)*a*b*PolyLog[2, I*E^(I*ArcSin[c*x])] + (2*I)*b^
2*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSin[c*x])] + (2*I)*b^2*ArcSin[c*x]*Po
lyLog[2, -E^((2*I)*ArcSin[c*x])] - (2*I)*a*b*PolyLog[2, E^((2*I)*ArcSin[c*x
])] + b^2*PolyLog[3, E^((-2*I)*ArcSin[c*x])] - b^2*PolyLog[3, -E^((2*I)*Arc
Sin[c*x])]])/(2*d^2)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 603 vs. $2(249) = 498$.

Time = 0.30 (sec) , antiderivative size = 604, normalized size of antiderivative = 2.86

method	result
parts	$\frac{a^2\left(\ln(x)-\frac{1}{4(cx-1)}-\frac{\ln(cx-1)}{2}+\frac{1}{4cx+4}-\frac{\ln(cx+1)}{2}\right)}{d^2}+\frac{b^2\left(-\frac{\left(2ic^2x^2-2cx\sqrt{-c^2x^2+1}+\arcsin(cx)-2i\right)\arcsin(cx)}{2\left(c^2x^2-1\right)}-\ln\left(1+\left(icx\right.\right.}{}$
derivativedivides	$\frac{a^2\left(\ln(cx)-\frac{1}{4(cx-1)}-\frac{\ln(cx-1)}{2}+\frac{1}{4cx+4}-\frac{\ln(cx+1)}{2}\right)}{d^2}+\frac{b^2\left(-\frac{\left(2ic^2x^2-2cx\sqrt{-c^2x^2+1}+\arcsin(cx)-2i\right)\arcsin(cx)}{2\left(c^2x^2-1\right)}-\ln\left(1+\left(icx\right.\right.}{}$
default	$\frac{a^2\left(\ln(cx)-\frac{1}{4(cx-1)}-\frac{\ln(cx-1)}{2}+\frac{1}{4cx+4}-\frac{\ln(cx+1)}{2}\right)}{d^2}+\frac{b^2\left(-\frac{\left(2ic^2x^2-2cx\sqrt{-c^2x^2+1}+\arcsin(cx)-2i\right)\arcsin(cx)}{2\left(c^2x^2-1\right)}-\ln\left(1+\left(icx\right.\right.}{}$

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] a^2/d^2*(ln(x)-1/4/(c*x-1)-1/2*ln(c*x-1)+1/4/(c*x+1)-1/2*ln(c*x+1))+b^2/d^2
*(-1/2*(2*I*c^2*x^2-2*c*x*(-c^2*x^2+1)^(1/2)+arcsin(c*x)-2*I)*arcsin(c*x)/(
c^2*x^2-1)-ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*ln(I*c*x+(-c^2*x^2+1)^(1/2)
)+arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*arcsin(c*x)*polylog(2,-I
*c*x-(-c^2*x^2+1)^(1/2))+2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-arcsin(c*x)
^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+I*arcsin(c*x)*polylog(2,-(I*c*x+(-c^2
*x^2+1)^(1/2))^2)-1/2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+arcsin(c*x)^
2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+
1)^(1/2))+2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2)))+2*a*b/d^2*(-1/2*(I*c^2*x^2
-c*x*(-c^2*x^2+1)^(1/2)+arcsin(c*x)-I)/(c^2*x^2-1)+arcsin(c*x)*ln(1+I*c*x+(
-c^2*x^2+1)^(1/2))-I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-arcsin(c*x)*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2
)+arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*polylog(2,I*c*x+(-c^2*x^2+1)
^(1/2)))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\left(d-c^2dx^2\right)^2}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(c^2dx^2-d\right)^2x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^5 - 2*c^2
*d^2*x^3 + d^2*x), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\left(d-c^2dx^2\right)^2}\,dx = \frac{\int \frac{a^2}{c^4x^5-2c^2x^3+x}\,dx + \int \frac{b^2\operatorname{asin}^2\left(cx\right)}{c^4x^5-2c^2x^3+x}\,dx + \int \frac{2ab\operatorname{asin}\left(cx\right)}{c^4x^5-2c^2x^3+x}\,dx}{d^2}$$

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2/(c**4*x**5 - 2*c**2*x**3 + x), x) + Integral(b**2*asin(c*x)*
*2/(c**4*x**5 - 2*c**2*x**3 + x), x) + Integral(2*a*b*asin(c*x)/(c**4*x**5
- 2*c**2*x**3 + x), x))/d**2
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\left(d-c^2dx^2\right)^2}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(c^2dx^2-d\right)^2x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(1/(c^2*d^2*x^2 - d^2) + log(c*x + 1)/d^2 + log(c*x - 1)/d^2 - 2*l
og(x)/d^2) + integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 +
2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^4*d^2*x^5 - 2*c^2*d^2*
x^3 + d^2*x), x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\left(d-c^2dx^2\right)^2}\,dx=\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(c^2dx^2-d\right)^2x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^2*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x\left(d-c^2dx^2\right)^2}\,dx=\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{x\,\left(d-c^2\,d\,x^2\right)^2}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^2),x)
[Out] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^2), x)
```

3.198 $\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 324

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^2}\,dx = &-\frac{bc(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}}-\frac{(a+b\arcsin(cx))^2}{d^2x\left(1-c^2x^2\right)}\\ &+\frac{3c^2x(a+b\arcsin(cx))^2}{2d^2\left(1-c^2x^2\right)}\\ &-\frac{3ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d^2}\\ &-\frac{4bc(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2}\\ &+\frac{b^2c\,\text{arctanh}(cx)}{d^2}+\frac{2ib^2c\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^2}\\ &+\frac{3ibc(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d^2}\\ &-\frac{3ibc(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d^2}\\ &-\frac{2ib^2c\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^2}-\frac{3b^2c\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{d^2}\\ &+\frac{3b^2c\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{d^2}\end{aligned}$$

```
[Out] -(a+b*arcsin(c*x))^2/d^2/x/(-c^2*x^2+1)+3/2*c^2*x*(a+b*arcsin(c*x))^2/d^2/(
-c^2*x^2+1)-3*I*c*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d^2-
4*b*c*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))/d^2+b^2*c*arctanh
(c*x)/d^2+2*I*b^2*c*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))/d^2+3*I*b*c*(a+b*a
rcsin(c*x))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-3*I*b*c*(a+b*arcsi
n(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-2*I*b^2*c*polylog(2,I*c
```

```
*x+(-c^2*x^2+1)^(1/2))/d^2-3*b^2*c*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
/d^2+3*b^2*c*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-b*c*(a+b*arcsin(c*
x))/d^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.36 (sec) , antiderivative size = 324, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.519, Rules used = {4789, 4747, 4749, 4266, 2611, 2320, 6724, 4767, 212, 4793, 4803, 4268, 2317, 2438}

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^2}\,dx = &-\frac{3ic\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{d^2}\\ &-\frac{4bc\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2}\\ &-\frac{bc(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}}\\ &+\frac{3c^2x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)}-\frac{(a+b\arcsin(cx))^2}{d^2x(1-c^2x^2)}\\ &+\frac{3ibc\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2}\\ &-\frac{3ibc\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2}\\ &+\frac{2ib^2c\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^2}\\ &-\frac{2ib^2c\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^2}-\frac{3b^2c\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{d^2}\\ &+\frac{3b^2c\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{d^2}+\frac{b^2c\text{arctanh}(cx)}{d^2}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^2),x]
```

```
[Out] -((b*c*(a + b*ArcSin[c*x]))/(d^2*Sqrt[1 - c^2*x^2])) - (a + b*ArcSin[c*x])^
2/(d^2*x*(1 - c^2*x^2)) + (3*c^2*x*(a + b*ArcSin[c*x])^2)/(2*d^2*(1 - c^2*x
^2)) - ((3*I)*c*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (4*b
*c*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/d^2 + (b^2*c*ArcTanh[c*x
])/d^2 + ((2*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])])/d^2 + ((3*I)*b*c*(a +
 b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^2 - ((3*I)*b*c*(a + b
*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2 - ((2*I)*b^2*c*PolyLog[2
, E^(I*ArcSin[c*x])])/d^2 - (3*b^2*c*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/d^
2 + (3*b^2*c*PolyLog[3, I*E^(I*ArcSin[c*x])])/d^2
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
```

```
Q[a, 0] || LtQ[b, 0])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
```

```
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(a+b\arcsin(cx))^2}{d^2x(1-c^2x^2)}+(3c^2)\int\frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx+\frac{(2bc)\int\frac{a+b\arcsin(cx)}{x(1-c^2x^2)^{3/2}}\,dx}{d^2}\\
&= \frac{2bc(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}}-\frac{(a+b\arcsin(cx))^2}{d^2x(1-c^2x^2)}+\frac{3c^2x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)}\\
&\quad+\frac{(2bc)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{d^2}-\frac{(2b^2c^2)\int\frac{1}{1-c^2x^2}\,dx}{d^2}\\
&\quad-\frac{(3bc^3)\int\frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{d^2}+\frac{(3c^2)\int\frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{2d}\\
&= -\frac{bc(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}}-\frac{(a+b\arcsin(cx))^2}{d^2x(1-c^2x^2)}+\frac{3c^2x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)}\\
&\quad-\frac{2b^2c\,\text{arctanh}(cx)}{d^2}+\frac{(3c)\text{Subst}\left(\int(a+bx)^2\sec(x)\,dx,x,\arcsin(cx)\right)}{2d^2}\\
&\quad+\frac{(2bc)\text{Subst}\left(\int(a+bx)\csc(x)\,dx,x,\arcsin(cx)\right)}{d^2}+\frac{(3b^2c^2)\int\frac{1}{1-c^2x^2}\,dx}{d^2}\\
&= -\frac{bc(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}}-\frac{(a+b\arcsin(cx))^2}{d^2x(1-c^2x^2)}+\frac{3c^2x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)}\\
&\quad-\frac{3ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d^2}\\
&\quad-\frac{4bc(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2}+\frac{b^2c\,\text{arctanh}(cx)}{d^2}\\
&\quad-\frac{(3bc)\text{Subst}\left(\int(a+bx)\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2}\\
&\quad+\frac{(3bc)\text{Subst}\left(\int(a+bx)\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2}\\
&\quad-\frac{(2b^2c)\,\text{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2}\\
&\quad+\frac{(2b^2c)\,\text{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2}
\end{aligned}$$

$$= -\frac{bc(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{d^2x(1-c^2x^2)} + \frac{3c^2x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{3ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d^2} - \frac{4bc(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2} + \frac{b^2c\text{arctanh}(cx)}{d^2} + \frac{3ibc(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d^2} - \frac{3ibc(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d^2} + \frac{(2ib^2c)\,\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^2} - \frac{(2ib^2c)\,\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^2} - \frac{(3ib^2c)\,\text{Subst}\left(\int\text{PolyLog}\left(2,-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2} + \frac{(3ib^2c)\,\text{Subst}\left(\int\text{PolyLog}\left(2,ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2}$$

$$= -\frac{bc(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{d^2x(1-c^2x^2)} + \frac{3c^2x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{3ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d^2} - \frac{4bc(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2} + \frac{b^2c\text{arctanh}(cx)}{d^2} + \frac{2ib^2c\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^2} + \frac{3ibc(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d^2} - \frac{3ibc(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d^2} - \frac{2ib^2c\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^2} - \frac{(3b^2c)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^2} + \frac{(3b^2c)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^2}$$

$$= -\frac{bc(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{d^2x\,(1-c^2x^2)} + \frac{3c^2x(a+b\arcsin(cx))^2}{2d^2\,(1-c^2x^2)}$$
$$- \frac{3ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d^2}$$
$$- \frac{4bc(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2} + \frac{b^2c\,\text{arctanh}(cx)}{d^2}$$
$$+ \frac{2ib^2c\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^2} + \frac{3ibc(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d^2}$$
$$- \frac{3ibc(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d^2} - \frac{2ib^2c\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^2}$$
$$- \frac{3b^2c\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{d^2} + \frac{3b^2c\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{d^2}$$

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1161 vs. $2(324) = 648$.

Time = 10.44 (sec) , antiderivative size = 1161, normalized size of antiderivative = 3.58

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\,(d-c^2dx^2)^2}\,dx = -\frac{a^2}{d^2x} - \frac{a^2c^2x}{2d^2\,(-1+c^2x^2)} - \frac{3a^2c\log(1-cx)}{4d^2} + \frac{3a^2c\log(1+cx)}{4d^2}$$
$$+ \frac{2abc\left(\frac{\sqrt{1-c^2x^2}-\arcsin(cx)}{4(-1+cx)} - \frac{\arcsin(cx)}{cx} - \frac{\sqrt{1-c^2x^2}+\arcsin(cx)}{4(1+cx)} - \text{arctanh}\left(\sqrt{1-c^2x^2}\right) - \frac{3}{4}\left(\frac{3}{2}i\pi\arcsin(cx) - \frac{1}{2}i\,\text{ar}\right.\right.}{}$$
$$+ \frac{b^2c\left(-4\arcsin(cx) - 2\arcsin(cx)^2\cot\left(\frac{1}{2}\arcsin(cx)\right) + 8\arcsin(cx)\log\left(1-e^{i\arcsin(cx)}\right) + 6\arcsin(cx)^2\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^2),x]
```

```
[Out] -(a^2/(d^2*x)) - (a^2*c^2*x)/(2*d^2*(-1 + c^2*x^2)) - (3*a^2*c*Log[1 - c*x]
)/(4*d^2) + (3*a^2*c*Log[1 + c*x])/(4*d^2) + (2*a*b*c*((Sqrt[1 - c^2*x^2] -
 ArcSin[c*x])/(4*(-1 + c*x)) - ArcSin[c*x]/(c*x) - (Sqrt[1 - c^2*x^2] + Arc
Sin[c*x])/(4*(1 + c*x)) - ArcTanh[Sqrt[1 - c^2*x^2]] - (3*(((3*I)/2)*Pi*Arc
Sin[c*x] - (I/2)*ArcSin[c*x]^2 + 2*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - Pi*Lo
g[1 + I*E^(I*ArcSin[c*x])] + 2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - 2
*Pi*Log[Cos[ArcSin[c*x]/2]] + Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*
PolyLog[2, (-I)*E^(I*ArcSin[c*x])]))/4 + (3*((I/2)*Pi*ArcSin[c*x] - (I/2)*A
rcSin[c*x]^2 + 2*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + Pi*Log[1 - I*E^(I*ArcSi
n[c*x])] + 2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*Pi*Log[Cos[ArcSin
[c*x]/2]] - Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*PolyLog[2, I*E^(I*A
rcSin[c*x])]))/4))/d^2 + (b^2*c*(-4*ArcSin[c*x] - 2*ArcSin[c*x]^2*Cot[ArcSi
n[c*x]/2] + 8*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 6*ArcSin[c*x]^2*Log[
1 - I*E^(I*ArcSin[c*x])] + 6*Pi*ArcSin[c*x]*Log[((-1)^(1/4)*(1 - I*E^(I*Arc
```

```
Sin[c*x])))/(2*E^((I/2)*ArcSin[c*x]))] - 6*ArcSin[c*x]^2*Log[1 + I*E^(I*Arc
Sin[c*x])] - 6*ArcSin[c*x]^2*Log[((1/2 + I/2)*(-I + E^(I*ArcSin[c*x])))/E^(
(I/2)*ArcSin[c*x])] + 6*Pi*ArcSin[c*x]*Log[-1/2*((-1)^(1/4)*(-I + E^(I*ArcS
in[c*x])))/E^((I/2)*ArcSin[c*x])] - 8*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])
] + 6*ArcSin[c*x]^2*Log[((1 + I) + (1 - I)*E^(I*ArcSin[c*x]))/(2*E^((I/2)*A
rcSin[c*x]))] - 6*Pi*ArcSin[c*x]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 4*Log[
Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 6*ArcSin[c*x]^2*Log[Cos[ArcSin[c
*x]/2] - Sin[ArcSin[c*x]/2]] + 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2
]] - 6*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 6*Pi*Ar
cSin[c*x]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (8*I)*PolyLog[2, -E^(I*ArcSin[
c*x])] + (12*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (12*I)*Arc
Sin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] - (8*I)*PolyLog[2, E^(I*ArcSin[c*x
])] - 12*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] + 12*PolyLog[3, I*E^(I*ArcSin[c
*x])] + ArcSin[c*x]^2/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2 - (4*ArcS
in[c*x]*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - Arc
Sin[c*x]^2/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 + (4*ArcSin[c*x]*Sin
[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 2*ArcSin[c*x]^
2*Tan[ArcSin[c*x]/2]))/(4*d^2)
```

Maple [A] (verified)

Time = 0.44 (sec) , antiderivative size = 605, normalized size of antiderivative = 1.87

method	result
derivativedivides	$c\left(\frac{a^2\left(-\frac{1}{cx}-\frac{1}{4(cx-1)}-\frac{3\ln(cx-1)}{4}-\frac{1}{4(cx+1)}+\frac{3\ln(cx+1)}{4}\right)}{d^2}+\frac{b^2\left(-\frac{\left(3c^2x^2\arcsin(cx)-2cx\sqrt{-c^2x^2+1}-2\arcsin(cx)\right)\arcsin(cx}{2cx\left(c^2x^2-1\right)}\right.}{}\right.$
default	$c\left(\frac{a^2\left(-\frac{1}{cx}-\frac{1}{4(cx-1)}-\frac{3\ln(cx-1)}{4}-\frac{1}{4(cx+1)}+\frac{3\ln(cx+1)}{4}\right)}{d^2}+\frac{b^2\left(-\frac{\left(3c^2x^2\arcsin(cx)-2cx\sqrt{-c^2x^2+1}-2\arcsin(cx)\right)\arcsin(cx}{2cx\left(c^2x^2-1\right)}\right.}{}\right.$
parts	$\frac{a^2\left(-\frac{1}{x}-\frac{c}{4(cx-1)}-\frac{3c\ln(cx-1)}{4}-\frac{c}{4(cx+1)}+\frac{3c\ln(cx+1)}{4}\right)}{d^2}+\frac{b^2c\left(-\frac{\left(3c^2x^2\arcsin(cx)-2cx\sqrt{-c^2x^2+1}-2\arcsin(cx)\right)\arcsin(cx)}{2cx\left(c^2x^2-1\right)}-\right.}{}$

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)

[Out] c*(a^2/d^2*(-1/c/x-1/4/(c*x-1)-3/4*ln(c*x-1)-1/4/(c*x+1)+3/4*ln(c*x+1))+b^2
/d^2*(-1/2/c/x/(c^2*x^2-1)*(3*c^2*x^2*arcsin(c*x)-2*c*x*(-c^2*x^2+1)^(1/2)-
2*arcsin(c*x))*arcsin(c*x)-3/2*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/
2)))+3*I*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3*polylog(3,-
I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^
(1/2)))-3*I*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3*polylog(3
,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+2*I*dilo
g(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*arctan(I*c*x+(-c^2*x^2+1)^(1/2))-2*arcsin
```

```
(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2)))+2*a*b/d^2*(-1/2*(3*c^2*x^2*arcsin(c*x
)-c*x*(-c^2*x^2+1)^(1/2)-2*arcsin(c*x))/c/x/(c^2*x^2-1)-3/2*arcsin(c*x)*ln(
1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)+3/2*arcsin(c
*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+3/2*I
*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/2*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^
(1/2)))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^2}\,dx=\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(c^2dx^2-d\right)^2x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^6 - 2*c^2
*d^2*x^4 + d^2*x^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^2}\,dx=\frac{\int \frac{a^2}{c^4x^6-2c^2x^4+x^2}\,dx+\int \frac{b^2\,\mathrm{asin}^2\left(cx\right)}{c^4x^6-2c^2x^4+x^2}\,dx+\int \frac{2ab\,\mathrm{asin}\left(cx\right)}{c^4x^6-2c^2x^4+x^2}\,dx}{d^2}$$

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2/(c**4*x**6 - 2*c**2*x**4 + x**2), x) + Integral(b**2*asin(c*
x)**2/(c**4*x**6 - 2*c**2*x**4 + x**2), x) + Integral(2*a*b*asin(c*x)/(c**4
*x**6 - 2*c**2*x**4 + x**2), x))/d**2
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^2}\,dx=\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(c^2dx^2-d\right)^2x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*(2*(3*c^2*x^2 - 2)/(c^2*d^2*x^3 - d^2*x) - 3*c*log(c*x + 1)/d^2 +
3*c*log(c*x - 1)/d^2) + 1/4*(3*(b^2*c^3*x^3 - b^2*c*x)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 3*(b^2*c^3*x^3 - b^2*c*x)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*(3*b^2*c^2*x^2 - 2*b^
2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 4*(c^2*d^2*x^3 - d^2*x)*i
ntegrate(1/2*(4*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (3*(b^2*c^
```

```
4*x^4 - b^2*c^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1
) - 3*(b^2*c^4*x^4 - b^2*c^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
)*log(-c*x + 1) - 2*(3*b^2*c^3*x^3 - 2*b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^6 - 2*c^2*d^2*x^4
 + d^2*x^2), x))/(c^2*d^2*x^3 - d^2*x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)^2x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^2*x^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^2\,(d-c^2\,d\,x^2)^2}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^2),x)
[Out] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^2), x)
```

3.199 $\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^2} dx$

Optimal result

Integrand size = 27, antiderivative size = 270

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^2}\,dx =& -\frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\arcsin(cx))^2}{d^2(1-c^2x^2)} \\ &-\frac{(a+b\arcsin(cx))^2}{2d^2x^2(1-c^2x^2)} \\ &-\frac{4c^2(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2} \\ &+\frac{b^2c^2\log(x)}{d^2}-\frac{b^2c^2\log(1-c^2x^2)}{2d^2} \\ &+\frac{2ibc^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^2} \\ &-\frac{2ibc^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2} \\ &-\frac{b^2c^2\operatorname{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{d^2}+\frac{b^2c^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{d^2}\end{aligned}$$

```
[Out] c^2*(a+b*arcsin(c*x))^2/d^2/(-c^2*x^2+1)-1/2*(a+b*arcsin(c*x))^2/d^2/x^2/(-
c^2*x^2+1)-4*c^2*(a+b*arcsin(c*x))^2*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/
d^2+b^2*c^2*ln(x)/d^2-1/2*b^2*c^2*ln(-c^2*x^2+1)/d^2+2*I*b*c^2*(a+b*arcsin(
c*x))*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-2*I*b*c^2*(a+b*arcsin(c*
x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^2-b^2*c^2*polylog(3,-(I*c*x+(
-c^2*x^2+1)^(1/2))^2)/d^2+b^2*c^2*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d
^2-b*c*(a+b*arcsin(c*x))/d^2/x/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.556, Rules used = {4789, 4793, 4769, 4504, 4268, 2611, 2320, 6724, 4745, 266, 277, 197, 4779, 457, 78}

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^2}\,dx = -\frac{4c^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{d^2} + \frac{2ibc^2\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2} - \frac{2ibc^2\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2} + \frac{c^2(a+b\arcsin(cx))^2}{d^2(1-c^2x^2)} - \frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{2d^2x^2(1-c^2x^2)} - \frac{b^2c^2\,\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{d^2} + \frac{b^2c^2\,\text{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{d^2} - \frac{b^2c^2\log(1-c^2x^2)}{2d^2} + \frac{b^2c^2\log(x)}{d^2}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^2),x]
```

```
[Out] -((b*c*(a + b*ArcSin[c*x]))/(d^2*x*Sqrt[1 - c^2*x^2])) + (c^2*(a + b*ArcSin
[c*x])^2)/(d^2*(1 - c^2*x^2)) - (a + b*ArcSin[c*x])^2/(2*d^2*x^2*(1 - c^2*x
^2)) - (4*c^2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^2 + (
b^2*c^2*Log[x])/d^2 - (b^2*c^2*Log[1 - c^2*x^2])/(2*d^2) + ((2*I)*b*c^2*(a
+ b*ArcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^2 - ((2*I)*b*c^2*(a
+ b*ArcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^2 - (b^2*c^2*PolyLog[
3, -E^((2*I)*ArcSin[c*x])])/d^2 + (b^2*c^2*PolyLog[3, E^((2*I)*ArcSin[c*x])
])/d^2
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(a+b\arcsin(cx))^2}{2d^2x^2(1-c^2x^2)}+(2c^2)\int\frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^2}\,dx+\frac{(bc)\int\frac{a+b\arcsin(cx)}{x^2(1-c^2x^2)^{3/2}}\,dx}{d^2}\\
&= -\frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}}+\frac{2bc^3x(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}}\\
&\quad+\frac{c^2(a+b\arcsin(cx))^2}{d^2(1-c^2x^2)}-\frac{(a+b\arcsin(cx))^2}{2d^2x^2(1-c^2x^2)}-\frac{(b^2c^2)\int\frac{-1+2c^2x^2}{x(1-c^2x^2)}\,dx}{d^2}\\
&\quad-\frac{(2bc^3)\int\frac{a+b\arcsin(cx)}{(1-c^2x^2)^{3/2}}\,dx}{d^2}+\frac{(2c^2)\int\frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)}\,dx}{d}\\
&= -\frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\arcsin(cx))^2}{d^2(1-c^2x^2)}-\frac{(a+b\arcsin(cx))^2}{2d^2x^2(1-c^2x^2)}\\
&\quad+\frac{(2c^2)\operatorname{Subst}\left(\int(a+bx)^2\csc(x)\sec(x)\,dx,x,\arcsin(cx)\right)}{d^2}\\
&\quad-\frac{(b^2c^2)\operatorname{Subst}\left(\int\frac{-1+2c^2x}{x(1-c^2x)}\,dx,x,x^2\right)}{2d^2}+\frac{(2b^2c^4)\int\frac{x}{1-c^2x^2}\,dx}{d^2}\\
&= -\frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\arcsin(cx))^2}{d^2(1-c^2x^2)}-\frac{(a+b\arcsin(cx))^2}{2d^2x^2(1-c^2x^2)}\\
&\quad-\frac{b^2c^2\log(1-c^2x^2)}{d^2}+\frac{(4c^2)\operatorname{Subst}\left(\int(a+bx)^2\csc(2x)\,dx,x,\arcsin(cx)\right)}{d^2}\\
&\quad-\frac{(b^2c^2)\operatorname{Subst}\left(\int\left(-\frac{1}{x}-\frac{c^2}{-1+c^2x}\right)\,dx,x,x^2\right)}{2d^2}\\
&= -\frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}}+\frac{c^2(a+b\arcsin(cx))^2}{d^2(1-c^2x^2)}-\frac{(a+b\arcsin(cx))^2}{2d^2x^2(1-c^2x^2)}\\
&\quad-\frac{4c^2(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2}+\frac{b^2c^2\log(x)}{d^2}\\
&\quad-\frac{b^2c^2\log(1-c^2x^2)}{2d^2}-\frac{(4bc^2)\operatorname{Subst}\left(\int(a+bx)\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2}\\
&\quad+\frac{(4bc^2)\operatorname{Subst}\left(\int(a+bx)\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2}
\end{aligned}$$

$$= -\frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2(a+b\arcsin(cx))^2}{d^2(1-c^2x^2)} - \frac{(a+b\arcsin(cx))^2}{2d^2x^2(1-c^2x^2)} - \frac{4c^2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2} + \frac{b^2c^2\log(x)}{d^2} - \frac{b^2c^2\log(1-c^2x^2)}{2d^2} + \frac{2ibc^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^2} - \frac{2ibc^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2} - \frac{(2ib^2c^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^2} + \frac{(2ib^2c^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^2}$$

$$= -\frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2(a+b\arcsin(cx))^2}{d^2(1-c^2x^2)} - \frac{(a+b\arcsin(cx))^2}{2d^2x^2(1-c^2x^2)} - \frac{4c^2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2} + \frac{b^2c^2\log(x)}{d^2} - \frac{b^2c^2\log(1-c^2x^2)}{2d^2} + \frac{2ibc^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^2} - \frac{2ibc^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2} - \frac{(b^2c^2)\,\text{Subst}\left(\int \frac{\text{PolyLog}(2,-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{d^2} + \frac{(b^2c^2)\,\text{Subst}\left(\int \frac{\text{PolyLog}(2,x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{d^2}$$

$$= -\frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}} + \frac{c^2(a+b\arcsin(cx))^2}{d^2(1-c^2x^2)} - \frac{(a+b\arcsin(cx))^2}{2d^2x^2(1-c^2x^2)} - \frac{4c^2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2} + \frac{b^2c^2\log(x)}{d^2} - \frac{b^2c^2\log(1-c^2x^2)}{2d^2} + \frac{2ibc^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^2} - \frac{2ibc^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2} - \frac{b^2c^2\,\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{d^2} + \frac{b^2c^2\,\text{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{d^2}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 759 vs. 2(270) = 540.

Time = 1.73 (sec) , antiderivative size = 759, normalized size of antiderivative = 2.81

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^2}\,dx$$
$$= \frac{-\frac{a^2}{x^2}+\frac{a^2c^2}{1-c^2x^2}-\frac{2abc\sqrt{1-c^2x^2}}{x}+\frac{abc^2\sqrt{1-c^2x^2}}{-1+cx}+\frac{abc^2\sqrt{1-c^2x^2}}{1+cx}-8iabc^2\pi\arcsin(cx)-\frac{2ab\arcsin(cx)}{x^2}+\frac{abc^2\arcsin(cx)}{1-cx}+}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^2),x]
```

```
[Out] (-(a^2/x^2) + (a^2*c^2)/(1 - c^2*x^2) - (2*a*b*c*Sqrt[1 - c^2*x^2])/x + (a*
b*c^2*Sqrt[1 - c^2*x^2])/(-1 + c*x) + (a*b*c^2*Sqrt[1 - c^2*x^2])/(1 + c*x)
 - (8*I)*a*b*c^2*Pi*ArcSin[c*x] - (2*a*b*ArcSin[c*x])/x^2 + (a*b*c^2*ArcSin
[c*x])/(1 - c*x) + (a*b*c^2*ArcSin[c*x])/(1 + c*x) - (2*b^2*c^3*x*ArcSin[c*
x])/Sqrt[1 - c^2*x^2] - (2*b^2*c*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/x - (b^2*Ar
cSin[c*x]^2)/x^2 + (b^2*c^2*ArcSin[c*x]^2)/(1 - c^2*x^2) - 16*a*b*c^2*Pi*Lo
g[1 + E^((-I)*ArcSin[c*x])] - 4*a*b*c^2*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 8
*a*b*c^2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 4*a*b*c^2*Pi*Log[1 + I*
E^(I*ArcSin[c*x])] - 8*a*b*c^2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 8
*a*b*c^2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 4*b^2*c^2*ArcSin[c*x]
^2*Log[1 - E^((2*I)*ArcSin[c*x])] - 4*b^2*c^2*ArcSin[c*x]^2*Log[1 + E^((2*I
)*ArcSin[c*x])] + 4*a^2*c^2*Log[x] + 2*b^2*c^2*Log[(c*x)/Sqrt[1 - c^2*x^2]]
 - 2*a^2*c^2*Log[1 - c^2*x^2] + 16*a*b*c^2*Pi*Log[Cos[ArcSin[c*x]/2]] - 4*a
*b*c^2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 4*a*b*c^2*Pi*Log[Sin[(Pi + 2*
ArcSin[c*x])/4]] + (8*I)*a*b*c^2*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (8*I)
*a*b*c^2*PolyLog[2, I*E^(I*ArcSin[c*x])] + (4*I)*b^2*c^2*ArcSin[c*x]*PolyLo
g[2, -E^((2*I)*ArcSin[c*x])] - (4*I)*a*b*c^2*PolyLog[2, E^((2*I)*ArcSin[c*x
])] - (4*I)*b^2*c^2*ArcSin[c*x]*PolyLog[2, E^((2*I)*ArcSin[c*x])] - 2*b^2*c
^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])] + 2*b^2*c^2*PolyLog[3, E^((2*I)*ArcSi
n[c*x])])/(2*d^2)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 660 vs. 2(312) = 624.

Time = 0.38 (sec) , antiderivative size = 661, normalized size of antiderivative = 2.45

method	result
derivativedivides	$c^2 \left(\frac{a^2\left(-\frac{1}{2c^2x^2}+2\ln(cx)-\frac{1}{4(cx-1)}-\ln(cx-1)+\frac{1}{4cx+4}-\ln(cx+1)\right)}{d^2} + \frac{b^2\left(-\frac{\arcsin(cx)\left(2c^2x^2\arcsin(cx)-2cx\sqrt{-c^2x^2+1}-\right.}{2c^2x^2\left(c^2x^2-1\right)}\right.}{}\right.$
default	$c^2 \left(\frac{a^2\left(-\frac{1}{2c^2x^2}+2\ln(cx)-\frac{1}{4(cx-1)}-\ln(cx-1)+\frac{1}{4cx+4}-\ln(cx+1)\right)}{d^2} + \frac{b^2\left(-\frac{\arcsin(cx)\left(2c^2x^2\arcsin(cx)-2cx\sqrt{-c^2x^2+1}-\right.}{2c^2x^2\left(c^2x^2-1\right)}\right.}{}\right.$
parts	$\frac{a^2\left(-\frac{1}{2x^2}+2c^2\ln(x)-\frac{c^2}{4(cx-1)}-c^2\ln(cx-1)+\frac{c^2}{4cx+4}-c^2\ln(cx+1)\right)}{d^2} + \frac{b^2c^2\left(-\frac{\arcsin(cx)\left(2c^2x^2\arcsin(cx)-2cx\sqrt{-c^2x^2+1}-\right.}{2c^2x^2\left(c^2x^2-1\right)}\right.}{}$

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(a^2/d^2*(-1/2/c^2/x^2+2*ln(c*x)-1/4/(c*x-1)-ln(c*x-1)+1/4/(c*x+1)-ln(c
*x+1))+b^2/d^2*(-1/2/c^2/x^2/(c^2*x^2-1)*arcsin(c*x)*(2*c^2*x^2*arcsin(c*x)
-2*c*x*(-c^2*x^2+1)^(1/2)-arcsin(c*x))+ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))^2)+ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*arcsin(c*x)^
2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-4*I*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2
+1)^(1/2))+4*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2*arcsin(c*x)^2*ln(1+(I*c
*x+(-c^2*x^2+1)^(1/2))^2)+2*I*arcsin(c*x)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1
/2))^2)-polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*arcsin(c*x)^2*ln(1-I*c*x
-(-c^2*x^2+1)^(1/2))-4*I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+4*
polylog(3,I*c*x+(-c^2*x^2+1)^(1/2)))+2*a*b/d^2*(-1/2*(2*c^2*x^2*arcsin(c*x)
-c*x*(-c^2*x^2+1)^(1/2)-arcsin(c*x))/c^2/x^2/(c^2*x^2-1)-2*arcsin(c*x)*ln(1
+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))
+2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*polylog(2,-I*c*x-(-c^2*x^
2+1)^(1/2))+I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-2*I*polylog(2,I*c*x+
(-c^2*x^2+1)^(1/2))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\left(d-c^2dx^2\right)^2}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(c^2dx^2-d\right)^2x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^7 - 2*c^2
*d^2*x^5 + d^2*x^3), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\,(d-c^2dx^2)^2}\,dx = \frac{\int \frac{a^2}{c^4x^7-2c^2x^5+x^3}\,dx + \int \frac{b^2\operatorname{asin}^2{(cx)}}{c^4x^7-2c^2x^5+x^3}\,dx + \int \frac{2ab\operatorname{asin}{(cx)}}{c^4x^7-2c^2x^5+x^3}\,dx}{d^2}$$

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**2,x)
[Out] (Integral(a**2/(c**4*x**7 - 2*c**2*x**5 + x**3), x) + Integral(b**2*asin(c*
x)**2/(c**4*x**7 - 2*c**2*x**5 + x**3), x) + Integral(2*a*b*asin(c*x)/(c**4
*x**7 - 2*c**2*x**5 + x**3), x))/d**2
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\,(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2}{(c^2dx^2-d)^2x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
[Out] -1/2*a^2*(2*c^2*log(c*x + 1)/d^2 + 2*c^2*log(c*x - 1)/d^2 - 4*c^2*log(x)/d^
2 + (2*c^2*x^2 - 1)/(c^2*d^2*x^4 - d^2*x^2)) + integrate((b^2*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)))/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\,(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2}{(c^2dx^2-d)^2x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^2*x^3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\,(d-c^2dx^2)^2}\,dx = \int \frac{(a+b\operatorname{asin}(c\,x))^2}{x^3\,(d-c^2\,d\,x^2)^2}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^2),x)
[Out] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^2), x)
```

3.200 $\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 439

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^2}\,dx = &-\frac{b^2c^2}{3d^2x}-\frac{2bc^3(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}} \\ &-\frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}}-\frac{(a+b\arcsin(cx))^2}{3d^2x^3(1-c^2x^2)} \\ &-\frac{5c^2(a+b\arcsin(cx))^2}{3d^2x(1-c^2x^2)}+\frac{5c^4x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} \\ &-\frac{5ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d^2} \\ &-\frac{26bc^3(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d^2} \\ &+\frac{b^2c^3\operatorname{arctanh}(cx)}{d^2}+\frac{13ib^2c^3\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{3d^2} \\ &+\frac{5ibc^3(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d^2} \\ &-\frac{5ibc^3(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d^2} \\ &-\frac{13ib^2c^3\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{3d^2} \\ &-\frac{5b^2c^3\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{d^2} \\ &+\frac{5b^2c^3\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{d^2}\end{aligned}$$

```
[Out] -1/3*b^2*c^2/d^2/x-1/3*(a+b*arcsin(c*x))^2/d^2/x^3/(-c^2*x^2+1)-5/3*c^2*(a+
b*arcsin(c*x))^2/d^2/x/(-c^2*x^2+1)+5/2*c^4*x*(a+b*arcsin(c*x))^2/d^2/(-c^2
```

```
*x^2+1)-5*I*c^3*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d^2-26
/3*b*c^3*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))/d^2+b^2*c^3*ar
ctanh(c*x)/d^2+13/3*I*b^2*c^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))/d^2+5*I*
b*c^3*(a+b*arcsin(c*x))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-5*I*b*
c^3*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^2-13/3*I*b^
2*c^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))/d^2-5*b^2*c^3*polylog(3,-I*(I*c*x
+(-c^2*x^2+1)^(1/2)))/d^2+5*b^2*c^3*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))
/d^2-2/3*b*c^3*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)^(1/2)-1/3*b*c*(a+b*arcsin
(c*x))/d^2/x^2/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.64 (sec) , antiderivative size = 439, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.556$, Rules used = {4789, 4747, 4749, 4266, 2611, 2320, 6724, 4767, 212, 4793, 4803, 4268, 2317, 2438, 331}

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^2}\,dx = & -\frac{5ic^3\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{d^2} \\ & -\frac{26bc^3\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3d^2} \\ & +\frac{5ibc^3\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2} \\ & -\frac{5ibc^3\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2} \\ & -\frac{5c^2(a+b\arcsin(cx))^2}{3d^2x(1-c^2x^2)}-\frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}} \\ & -\frac{(a+b\arcsin(cx))^2}{3d^2x^3(1-c^2x^2)}+\frac{5c^4x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} \\ & -\frac{2bc^3(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}}+\frac{13ib^2c^3\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{3d^2} \\ & -\frac{13ib^2c^3\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{3d^2} \\ & -\frac{5b^2c^3\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{d^2} \\ & +\frac{5b^2c^3\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{d^2}+\frac{b^2c^3\text{arctanh}(cx)}{d^2}-\frac{b^2c^2}{3d^2x}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/3*(b^2*c^2)/(d^2*x) - (2*b*c^3*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[1 - c^2*
x^2]) - (b*c*(a + b*ArcSin[c*x]))/(3*d^2*x^2*Sqrt[1 - c^2*x^2]) - (a + b*Ar
cSin[c*x])^2/(3*d^2*x^3*(1 - c^2*x^2)) - (5*c^2*(a + b*ArcSin[c*x])^2)/(3*d
```

```
^2*x*(1 - c^2*x^2)) + (5*c^4*x*(a + b*ArcSin[c*x])^2)/(2*d^2*(1 - c^2*x^2))
 - ((5*I)*c^3*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d^2 - (26*b*
c^3*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/(3*d^2) + (b^2*c^3*ArcT
anh[c*x])/d^2 + (((13*I)/3)*b^2*c^3*PolyLog[2, -E^(I*ArcSin[c*x])])/d^2 + (
(5*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^2 - (
(5*I)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^2 - (((1
3*I)/3)*b^2*c^3*PolyLog[2, E^(I*ArcSin[c*x])])/d^2 - (5*b^2*c^3*PolyLog[3,
(-I)*E^(I*ArcSin[c*x])])/d^2 + (5*b^2*c^3*PolyLog[3, I*E^(I*ArcSin[c*x])])/
d^2
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
```

```
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(a+b\arcsin(cx))^2}{3d^2x^3\left(1-c^2x^2\right)}+\frac{1}{3}\left(5c^2\right)\int\frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^2}\,dx+\frac{(2bc)\int\frac{a+b\arcsin(cx)}{x^3\left(1-c^2x^2\right)^{3/2}}\,dx}{3d^2}\\
&= -\frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}}-\frac{(a+b\arcsin(cx))^2}{3d^2x^3\left(1-c^2x^2\right)}-\frac{5c^2(a+b\arcsin(cx))^2}{3d^2x\left(1-c^2x^2\right)}\\
&\quad+\left(5c^4\right)\int\frac{(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^2}\,dx+\frac{\left(b^2c^2\right)\int\frac{1}{x^2\left(1-c^2x^2\right)}\,dx}{3d^2}\\
&\quad+\frac{\left(bc^3\right)\int\frac{a+b\arcsin(cx)}{x\left(1-c^2x^2\right)^{3/2}}\,dx}{d^2}+\frac{\left(10bc^3\right)\int\frac{a+b\arcsin(cx)}{x\left(1-c^2x^2\right)^{3/2}}\,dx}{3d^2}
\end{aligned}$$

$$= -\frac{b^2c^2}{3d^2x} + \frac{13bc^3(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(a+b\arcsin(cx))^2}{3d^2x(1-c^2x^2)} + \frac{5c^4x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} + \frac{(bc^3)\int \frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{d^2} + \frac{(10bc^3)\int \frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{3d^2} + \frac{(b^2c^4)\int \frac{1}{1-c^2x^2}\,dx}{3d^2} - \frac{(b^2c^4)\int \frac{1}{1-c^2x^2}\,dx}{d^2} - \frac{(10b^2c^4)\int \frac{1}{1-c^2x^2}\,dx}{3d^2} - \frac{(5bc^5)\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{d^2} + \frac{(5c^4)\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{2d}$$

$$= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(a+b\arcsin(cx))^2}{3d^2x(1-c^2x^2)} + \frac{5c^4x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{4b^2c^3\operatorname{arctanh}(cx)}{d^2} + \frac{(5c^3)\operatorname{Subst}\left(\int (a+bx)^2\sec(x)\,dx, x, \arcsin(cx)\right)}{2d^2} + \frac{(bc^3)\operatorname{Subst}(\int (a+bx)\csc(x)\,dx, x, \arcsin(cx))}{d^2} + \frac{(10bc^3)\operatorname{Subst}(\int (a+bx)\csc(x)\,dx, x, \arcsin(cx))}{3d^2} + \frac{(5b^2c^4)\int \frac{1}{1-c^2x^2}\,dx}{d^2}$$

$$= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(a+b\arcsin(cx))^2}{3d^2x(1-c^2x^2)} + \frac{5c^4x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{5ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d^2} - \frac{26bc^3(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d^2} + \frac{b^2c^3\operatorname{arctanh}(cx)}{d^2} - \frac{(5bc^3)\operatorname{Subst}\left(\int (a+bx)\log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{d^2} + \frac{(5bc^3)\operatorname{Subst}\left(\int (a+bx)\log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{d^2} - \frac{(b^2c^3)\operatorname{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{d^2} + \frac{(b^2c^3)\operatorname{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{d^2} - \frac{(10b^2c^3)\operatorname{Subst}\left(\int \log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{3d^2} + \frac{(10b^2c^3)\operatorname{Subst}\left(\int \log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{3d^2}$$

$$
\begin{aligned}
&= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}} \\
&- \frac{(a+b\arcsin(cx))^2}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(a+b\arcsin(cx))^2}{3d^2x(1-c^2x^2)} \\
&+ \frac{5c^4x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{5ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d^2} \\
&- \frac{26bc^3(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d^2} + \frac{b^2c^3\text{arctanh}(cx)}{d^2} \\
&+ \frac{5ibc^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d^2} \\
&- \frac{5ibc^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d^2} \\
&+ \frac{(ib^2c^3)\,\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^2} \\
&- \frac{(ib^2c^3)\,\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^2} \\
&+ \frac{(10ib^2c^3)\,\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3d^2} \\
&- \frac{(10ib^2c^3)\,\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3d^2} \\
&- \frac{(5ib^2c^3)\,\text{Subst}\left(\int\text{PolyLog}\left(2,-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2} \\
&+ \frac{(5ib^2c^3)\,\text{Subst}\left(\int\text{PolyLog}\left(2,ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2}
\end{aligned}
$$

$$= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(a+b\arcsin(cx))^2}{3d^2x(1-c^2x^2)} + \frac{5c^4x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{5ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d^2} - \frac{26bc^3(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d^2} + \frac{b^2c^3\text{arctanh}(cx)}{d^2} + \frac{13ib^2c^3\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{3d^2} + \frac{5ibc^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d^2} - \frac{5ibc^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d^2} - \frac{13ib^2c^3\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{3d^2} - \frac{(5b^2c^3)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,-ix)}{x}dx,x,e^{i\arcsin(cx)}\right)}{d^2} + \frac{(5b^2c^3)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,ix)}{x}dx,x,e^{i\arcsin(cx)}\right)}{d^2}$$

$$= -\frac{b^2c^2}{3d^2x} - \frac{2bc^3(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{3d^2x^3(1-c^2x^2)} - \frac{5c^2(a+b\arcsin(cx))^2}{3d^2x(1-c^2x^2)} + \frac{5c^4x(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{5ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{d^2} - \frac{26bc^3(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d^2} + \frac{b^2c^3\text{arctanh}(cx)}{d^2} + \frac{13ib^2c^3\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{3d^2} + \frac{5ibc^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d^2} - \frac{5ibc^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d^2} - \frac{13ib^2c^3\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{3d^2} - \frac{5b^2c^3\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{d^2} + \frac{5b^2c^3\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{d^2}$$

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1390 vs. 2(439) = 878.

Time = 12.42 (sec) , antiderivative size = 1390, normalized size of antiderivative = 3.17

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^2}\,dx$$
$$= -\frac{a^2}{3d^2x^3} - \frac{2a^2c^2}{d^2x} - \frac{a^2c^4x}{2d^2(-1+c^2x^2)} - \frac{5a^2c^3\log(1-cx)}{4d^2} + \frac{5a^2c^3\log(1+cx)}{4d^2}$$
$$+ \frac{2ab\left(\frac{c^3\left(\sqrt{1-c^2x^2}-\arcsin(cx)\right)}{4(-1+cx)} - \frac{c^4\left(\sqrt{1-c^2x^2}+\arcsin(cx)\right)}{4(c+c^2x)} + 2c^2\left(-\frac{\arcsin(cx)}{x} - c\,\mathrm{arctanh}\left(\sqrt{1-c^2x^2}\right)\right) - \frac{cx\sqrt{1-c^2x^2}+}{}\right.}{}$$
$$+ \frac{b^2c^3\left(-24\arcsin(cx) - \frac{6\arcsin(cx)^2}{-1+cx} - 4\cot\left(\frac{1}{2}\arcsin(cx)\right) - 26\arcsin(cx)^2\cot\left(\frac{1}{2}\arcsin(cx)\right) - 2\arcsin(cx\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^2),x]
```

```
[Out] -1/3*a^2/(d^2*x^3) - (2*a^2*c^2)/(d^2*x) - (a^2*c^4*x)/(2*d^2*(-1 + c^2*x^2
)) - (5*a^2*c^3*Log[1 - c*x])/(4*d^2) + (5*a^2*c^3*Log[1 + c*x])/(4*d^2) +
(2*a*b*((c^3*(Sqrt[1 - c^2*x^2] - ArcSin[c*x]))/(4*(-1 + c*x)) - (c^4*(Sqrt
[1 - c^2*x^2] + ArcSin[c*x]))/(4*(c + c^2*x)) + 2*c^2*(-(ArcSin[c*x]/x) - c
*ArcTanh[Sqrt[1 - c^2*x^2]]) - (c*x*Sqrt[1 - c^2*x^2] + 2*ArcSin[c*x] + c^3
*x^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*x^3) - (5*c^4*((((3*I)/2)*Pi*ArcSin[c*x
])/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c - (
Pi*Log[1 + I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c
*x])])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c + (Pi*Log[-Cos[(Pi + 2*ArcSin[c
*x])/4]])/c - ((2*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/c))/4 + (5*c^4*(((
I/2)*Pi*ArcSin[c*x])/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*Ar
cSin[c*x])])/c + (Pi*Log[1 - I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1
 - I*E^(I*ArcSin[c*x])])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c - (Pi*Log[Sin
[(Pi + 2*ArcSin[c*x])/4]])/c - ((2*I)*PolyLog[2, I*E^(I*ArcSin[c*x])])/c))/
4))/d^2 + (b^2*c^3*(-24*ArcSin[c*x] - (6*ArcSin[c*x]^2)/(-1 + c*x) - 4*Cot[
ArcSin[c*x]/2] - 26*ArcSin[c*x]^2*Cot[ArcSin[c*x]/2] - 2*ArcSin[c*x]*Csc[Ar
cSin[c*x]/2]^2 - (c*x*ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^4)/2 + 104*ArcSin[c*
x]*Log[1 - E^(I*ArcSin[c*x])] + 60*ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[c*x]
)] + 60*Pi*ArcSin[c*x]*Log[((-1)^(1/4)*(1 - I*E^(I*ArcSin[c*x])))/(2*E^((I/
2)*ArcSin[c*x]))] - 60*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] - 60*ArcS
in[c*x]^2*Log[((1/2 + I/2)*(-I + E^(I*ArcSin[c*x])))/E^((I/2)*ArcSin[c*x])]
 + 60*Pi*ArcSin[c*x]*Log[-1/2*((-1)^(1/4)*(-I + E^(I*ArcSin[c*x])))/E^((I/2
)*ArcSin[c*x])] - 104*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + 60*ArcSin[c*
x]^2*Log[((1 + I) + (1 - I)*E^(I*ArcSin[c*x]))/(2*E^((I/2)*ArcSin[c*x]))] -
 60*Pi*ArcSin[c*x]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 24*Log[Cos[ArcSin[c*
```

```
x]/2] - Sin[ArcSin[c*x]/2]] + 60*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] - Sin
[ArcSin[c*x]/2]] + 24*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 60*Arc
Sin[c*x]^2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 60*Pi*ArcSin[c*x]
*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (104*I)*PolyLog[2, -E^(I*ArcSin[c*x])]
 + (120*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (120*I)*ArcSin[c
*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] - (104*I)*PolyLog[2, E^(I*ArcSin[c*x])]
 - 120*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] + 120*PolyLog[3, I*E^(I*ArcSin[c*
x])] + 2*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - (24*ArcSin[c*x]*Sin[ArcSin[c*x]
/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (8*ArcSin[c*x]^2*Sin[ArcSi
n[c*x]/2]^4)/(c^3*x^3) - (6*ArcSin[c*x]^2)/(Cos[ArcSin[c*x]/2] + Sin[ArcSin
[c*x]/2])^2 + (24*ArcSin[c*x]*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin
[ArcSin[c*x]/2]) - 4*Tan[ArcSin[c*x]/2] - 26*ArcSin[c*x]^2*Tan[ArcSin[c*x]/
2]))/(24*d^2)
```

Maple [A] (verified)

Time = 0.55 (sec) , antiderivative size = 707, normalized size of antiderivative = 1.61

method	result
derivativedivides	$c^3\left(\frac{a^2\left(-\frac{1}{3c^3x^3}-\frac{2}{cx}-\frac{1}{4(cx-1)}-\frac{5\ln(cx-1)}{4}-\frac{1}{4(cx+1)}+\frac{5\ln(cx+1)}{4}\right)}{d^2}+\frac{b^2\left(-\frac{15\arcsin(cx)^2x^4c^4-4\sqrt{-c^2x^2+1}\,\arcsin(cx)c^3}{}\right.}{}\right.$
default	$c^3\left(\frac{a^2\left(-\frac{1}{3c^3x^3}-\frac{2}{cx}-\frac{1}{4(cx-1)}-\frac{5\ln(cx-1)}{4}-\frac{1}{4(cx+1)}+\frac{5\ln(cx+1)}{4}\right)}{d^2}+\frac{b^2\left(-\frac{15\arcsin(cx)^2x^4c^4-4\sqrt{-c^2x^2+1}\,\arcsin(cx)c^3}{}\right.}{}\right.$
parts	$\frac{a^2\left(-\frac{1}{3x^3}-\frac{2c^2}{x}-\frac{c^3}{4(cx-1)}-\frac{5c^3\ln(cx-1)}{4}-\frac{c^3}{4(cx+1)}+\frac{5c^3\ln(cx+1)}{4}\right)}{d^2}+\frac{b^2c^3\left(-\frac{15\arcsin(cx)^2x^4c^4-4\sqrt{-c^2x^2+1}\,\arcsin(cx)c^3}{}\right.}{}$

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(a^2/d^2*(-1/3/c^3/x^3-2/c/x-1/4/(c*x-1)-5/4*ln(c*x-1)-1/4/(c*x+1)+5/4*
ln(c*x+1))+b^2/d^2*(-1/6*(15*arcsin(c*x)^2*x^4*c^4-4*(-c^2*x^2+1)^(1/2)*arc
sin(c*x)*c^3*x^3-10*arcsin(c*x)^2*x^2*c^2+2*c^4*x^4-2*(-c^2*x^2+1)^(1/2)*ar
csin(c*x)*x*c-2*arcsin(c*x)^2-2*c^2*x^2)/c^3/x^3/(c^2*x^2-1)-5/2*arcsin(c*x
)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5*I*arcsin(c*x)*polylog(2,-I*(I*c*x+
(-c^2*x^2+1)^(1/2)))-5*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5/2*arcsin(
c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-5*I*arcsin(c*x)*polylog(2,I*(I*c*
x+(-c^2*x^2+1)^(1/2)))+5*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+13/3*I*dil
og(I*c*x+(-c^2*x^2+1)^(1/2))+13/3*I*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*a
rctan(I*c*x+(-c^2*x^2+1)^(1/2))-13/3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1
/2)))+2*a*b/d^2*(-1/6*(15*c^4*x^4*arcsin(c*x)-2*c^3*x^3*(-c^2*x^2+1)^(1/2)-
10*c^2*x^2*arcsin(c*x)-c*x*(-c^2*x^2+1)^(1/2)-2*arcsin(c*x))/(c^2*x^2-1)/c^
3/x^3-5/2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+13/6*ln(I*c*x+(-c^
```

```
2*x^2+1)^(1/2)-1)+5/2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-13/6*l
n(1+I*c*x+(-c^2*x^2+1)^(1/2))+5/2*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-5
/2*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^2}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(c^2dx^2-d\right)^2x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^4*d^2*x^8 - 2*c^2
*d^2*x^6 + d^2*x^4), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^2}\,dx = \frac{\int \frac{a^2}{c^4x^8-2c^2x^6+x^4}\,dx + \int \frac{b^2\operatorname{asin}^2\left(cx\right)}{c^4x^8-2c^2x^6+x^4}\,dx + \int \frac{2ab\operatorname{asin}\left(cx\right)}{c^4x^8-2c^2x^6+x^4}\,dx}{d^2}$$

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**2,x)
```

```
[Out] (Integral(a**2/(c**4*x**8 - 2*c**2*x**6 + x**4), x) + Integral(b**2*asin(c*
x)**2/(c**4*x**8 - 2*c**2*x**6 + x**4), x) + Integral(2*a*b*asin(c*x)/(c**4
*x**8 - 2*c**2*x**6 + x**4), x))/d**2
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^2}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(c^2dx^2-d\right)^2x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/12*(15*c^3*log(c*x + 1)/d^2 - 15*c^3*log(c*x - 1)/d^2 - 2*(15*c^4*x^4 - 1
0*c^2*x^2 - 2)/(c^2*d^2*x^5 - d^2*x^3))*a^2 + 1/12*(15*(b^2*c^5*x^5 - b^2*c
^3*x^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 15*(b^2
*c^5*x^5 - b^2*c^3*x^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c
*x + 1) - 2*(15*b^2*c^4*x^4 - 10*b^2*c^2*x^2 - 2*b^2)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))^2 + 12*(c^2*d^2*x^5 - d^2*x^3)*integrate(1/6*(12*a*b*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (15*(b^2*c^6*x^6 - b^2*c^4*x^4
)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 15*(b^2*c^6*x^6
 - b^2*c^4*x^4)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) -
2*(15*b^2*c^5*x^5 - 10*b^2*c^3*x^3 - 2*b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^8 - 2*c^2*d^2*x^6
 + d^2*x^4), x))/(c^2*d^2*x^5 - d^2*x^3)
```

Giac [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^2}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^4\,(d-c^2\,d\,x^2)^2}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^2),x)
[Out] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^2), x)
```

3.201 $\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 343

$$\begin{aligned}\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx &= \frac{b^2x}{12c^4d^3(1-c^2x^2)} - \frac{b(a+b\arcsin(cx))}{6c^5d^3(1-c^2x^2)^{3/2}} + \frac{5b(a+b\arcsin(cx))}{4c^5d^3\sqrt{1-c^2x^2}} \\ &\quad + \frac{x^3(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\arcsin(cx))^2}{8c^4d^3(1-c^2x^2)} \\ &\quad - \frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4c^5d^3} - \frac{7b^2\text{arctanh}(cx)}{6c^5d^3} \\ &\quad + \frac{3ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4c^5d^3} \\ &\quad - \frac{3ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4c^5d^3} \\ &\quad - \frac{3b^2\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4c^5d^3} + \frac{3b^2\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4c^5d^3}\end{aligned}$$

```
[Out] 1/12*b^2*x/c^4/d^3/(-c^2*x^2+1)-1/6*b*(a+b*arcsin(c*x))/c^5/d^3/(-c^2*x^2+1
)^(3/2)+1/4*x^3*(a+b*arcsin(c*x))^2/c^2/d^3/(-c^2*x^2+1)^2-3/8*x*(a+b*arcsi
n(c*x))^2/c^4/d^3/(-c^2*x^2+1)-3/4*I*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2
*x^2+1)^(1/2))/c^5/d^3-7/6*b^2*arctanh(c*x)/c^5/d^3+3/4*I*b*(a+b*arcsin(c*x
))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^3-3/4*I*b*(a+b*arcsin(c*x
))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^3-3/4*b^2*polylog(3,-I*(I*
c*x+(-c^2*x^2+1)^(1/2)))/c^5/d^3+3/4*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1
/2)))/c^5/d^3+5/4*b*(a+b*arcsin(c*x))/c^5/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 343, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.481, Rules used = {4791, 4749, 4266, 2611, 2320, 6724, 4767, 212, 272, 45, 4779, 12, 393}

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = -\frac{3i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{4c^5d^3} + \frac{3ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4c^5d^3} - \frac{3ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4c^5d^3} + \frac{x^3(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} + \frac{5b(a+b\arcsin(cx))}{4c^5d^3\sqrt{1-c^2x^2}} - \frac{b(a+b\arcsin(cx))}{6c^5d^3(1-c^2x^2)^{3/2}} - \frac{3x(a+b\arcsin(cx))^2}{8c^4d^3(1-c^2x^2)} - \frac{3b^2\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4c^5d^3} + \frac{3b^2\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4c^5d^3} - \frac{7b^2\text{arctanh}(cx)}{6c^5d^3} + \frac{b^2x}{12c^4d^3(1-c^2x^2)}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] (b^2*x)/(12*c^4*d^3*(1 - c^2*x^2)) - (b*(a + b*ArcSin[c*x]))/(6*c^5*d^3*(1
 - c^2*x^2)^(3/2)) + (5*b*(a + b*ArcSin[c*x]))/(4*c^5*d^3*Sqrt[1 - c^2*x^2])
 + (x^3*(a + b*ArcSin[c*x])^2)/(4*c^2*d^3*(1 - c^2*x^2)^2) - (3*x*(a + b*Ar
cSin[c*x])^2)/(8*c^4*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])^2*
ArcTan[E^(I*ArcSin[c*x])])/(c^5*d^3) - (7*b^2*ArcTanh[c*x])/(6*c^5*d^3) + (
((3*I)/4)*b*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^5*d^
3) - (((3*I)/4)*b*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^5
*d^3) - (3*b^2*PolyLog[3, (-I)*E^(I*ArcSin[c*x])])/(4*c^5*d^3) + (3*b^2*Pol
yLog[3, I*E^(I*ArcSin[c*x])])/(4*c^5*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 393

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(-(b*c - a*d))*x*((a + b*x^n)^(p + 1)/(a*b*n*(p + 1))), x] - Dist[(a*d -
 b*c*(n*(p + 1) + 1))/(a*b*n*(p + 1)), Int[(a + b*x^n)^(p + 1), x], x] /; F
reeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d, 0] && (LtQ[p, -1] || ILtQ[1/n
 + p, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{x^3(a+b\arcsin(cx))^2}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{b\int \frac{x^3(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{5/2}}\,dx}{2cd^3} - \frac{3\int \frac{x^2(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^2}\,dx}{4c^2d}$$

$$= -\frac{b(a+b\arcsin(cx))}{6c^5d^3(1-c^2x^2)^{3/2}}+\frac{b(a+b\arcsin(cx))}{2c^5d^3\sqrt{1-c^2x^2}}+\frac{x^3(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\arcsin(cx))^2}{8c^4d^3(1-c^2x^2)}+\frac{b^2\int\frac{-2+3c^2x^2}{3c^4(1-c^2x^2)^2}\,dx}{2d^3} + \frac{(3b)\int\frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{4c^3d^3}+\frac{3\int\frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{8c^4d^2}$$

$$= -\frac{b(a+b\arcsin(cx))}{6c^5d^3(1-c^2x^2)^{3/2}}+\frac{5b(a+b\arcsin(cx))}{4c^5d^3\sqrt{1-c^2x^2}}+\frac{x^3(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2}-\frac{3x(a+b\arcsin(cx))^2}{8c^4d^3(1-c^2x^2)} + \frac{3\text{Subst}\left(\int(a+bx)^2\sec(x)\,dx,x,\arcsin(cx)\right)}{8c^5d^3}+\frac{b^2\int\frac{-2+3c^2x^2}{(1-c^2x^2)^2}\,dx}{6c^4d^3}-\frac{(3b^2)\int\frac{1}{1-c^2x^2}\,dx}{4c^4d^3}$$

$$= \frac{b^2x}{12c^4d^3(1-c^2x^2)}-\frac{b(a+b\arcsin(cx))}{6c^5d^3(1-c^2x^2)^{3/2}}+\frac{5b(a+b\arcsin(cx))}{4c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2}-\frac{3x(a+b\arcsin(cx))^2}{8c^4d^3(1-c^2x^2)} - \frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4c^5d^3}-\frac{3b^2\text{arctanh}(cx)}{4c^5d^3} - \frac{(3b)\text{Subst}\left(\int(a+bx)\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{4c^5d^3} + \frac{(3b)\text{Subst}\left(\int(a+bx)\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{4c^5d^3}-\frac{(5b^2)\int\frac{1}{1-c^2x^2}\,dx}{12c^4d^3}$$

$$= \frac{b^2x}{12c^4d^3(1-c^2x^2)}-\frac{b(a+b\arcsin(cx))}{6c^5d^3(1-c^2x^2)^{3/2}}+\frac{5b(a+b\arcsin(cx))}{4c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2}-\frac{3x(a+b\arcsin(cx))^2}{8c^4d^3(1-c^2x^2)} - \frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4c^5d^3}-\frac{7b^2\text{arctanh}(cx)}{6c^5d^3} + \frac{3ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4c^5d^3} - \frac{3ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4c^5d^3} - \frac{(3ib^2)\,\text{Subst}\left(\int\text{PolyLog}\left(2,-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{4c^5d^3} + \frac{(3ib^2)\,\text{Subst}\left(\int\text{PolyLog}\left(2,ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{4c^5d^3}$$

$$= \frac{b^2x}{12c^4d^3(1-c^2x^2)} - \frac{b(a+b\arcsin(cx))}{6c^5d^3(1-c^2x^2)^{3/2}} + \frac{5b(a+b\arcsin(cx))}{4c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\arcsin(cx))^2}{8c^4d^3(1-c^2x^2)} - \frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4c^5d^3} - \frac{7b^2\text{arctanh}(cx)}{6c^5d^3} + \frac{3ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4c^5d^3} - \frac{3ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4c^5d^3} - \frac{(3b^2)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{4c^5d^3} + \frac{(3b^2)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{4c^5d^3}$$

$$= \frac{b^2x}{12c^4d^3(1-c^2x^2)} - \frac{b(a+b\arcsin(cx))}{6c^5d^3(1-c^2x^2)^{3/2}} + \frac{5b(a+b\arcsin(cx))}{4c^5d^3\sqrt{1-c^2x^2}} + \frac{x^3(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{3x(a+b\arcsin(cx))^2}{8c^4d^3(1-c^2x^2)} - \frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4c^5d^3} - \frac{7b^2\text{arctanh}(cx)}{6c^5d^3} + \frac{3ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4c^5d^3} - \frac{3ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4c^5d^3} - \frac{3b^2\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4c^5d^3} + \frac{3b^2\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4c^5d^3}$$

Mathematica [A] (verified)

Time = 5.77 (sec) , antiderivative size = 667, normalized size of antiderivative = 1.94

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \frac{\frac{24a^2cx}{(-1+c^2x^2)^2} + \frac{60a^2cx}{-1+c^2x^2} - \frac{60ab\left(\sqrt{1-c^2x^2}-\arcsin(cx)\right)}{-1+cx} + \frac{60ab\left(\sqrt{1-c^2x^2}+\arcsin(cx)\right)}{1+cx} + \frac{4ab\left((-2+cx)\sqrt{1-c^2x^2}+3\arcsin(cx)\right)}{(-1+cx)^2} - \frac{4a}{}}{}$$

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((24*a^2*c*x)/(-1 + c^2*x^2)^2 + (60*a^2*c*x)/(-1 + c^2*x^2) - (60*a*b*(Sqr
t[1 - c^2*x^2] - ArcSin[c*x]))/(-1 + c*x) + (60*a*b*(Sqrt[1 - c^2*x^2] + Ar
cSin[c*x]))/(1 + c*x) + (4*a*b*((-2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x
```

```
]))/(-1 + c*x)^2 - (4*a*b*((2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x]))/(1
 + c*x)^2 - 18*a^2*Log[1 - c*x] + 18*a^2*Log[1 + c*x] + 18*a*b*(I*ArcSin[c*
x]^2 + ArcSin[c*x]*((-3*I)*Pi - 4*Log[1 + I*E^(I*ArcSin[c*x])]) + 2*Pi*(-2*
Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 + I*E^(I*ArcSin[c*x])] + 2*Log[Cos[Ar
cSin[c*x]/2]] - Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]) + (4*I)*PolyLog[2, (-I)*
E^(I*ArcSin[c*x])]) + 18*a*b*((-I)*ArcSin[c*x]^2 + ArcSin[c*x]*(I*Pi + 4*Lo
g[1 - I*E^(I*ArcSin[c*x])]) + 2*Pi*(2*Log[1 + E^((-I)*ArcSin[c*x])] + Log[1
 - I*E^(I*ArcSin[c*x])] - 2*Log[Cos[ArcSin[c*x]/2]] - Log[Sin[(Pi + 2*ArcSi
n[c*x])/4]]) - (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]) + 8*b^2*((-9*I)*ArcSi
n[c*x]^2*ArcTan[E^(I*ArcSin[c*x])] - 14*ArcTanh[c*x] + (9*I)*ArcSin[c*x]*Po
lyLog[2, (-I)*E^(I*ArcSin[c*x])] - (9*I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcS
in[c*x])] - 9*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] + 9*PolyLog[3, I*E^(I*ArcS
in[c*x])]) + (b^2*(ArcSin[c*x]*(74*Sqrt[1 - c^2*x^2] + 30*Cos[3*ArcSin[c*x]
]) + 3*ArcSin[c*x]^2*(3*c*x - 5*Sin[3*ArcSin[c*x]]) + 2*(c*x + Sin[3*ArcSin
[c*x]])))/(-1 + c^2*x^2)^2)/(96*c^5*d^3)
```

Maple [A] (verified)

Time = 0.44 (sec) , antiderivative size = 570, normalized size of antiderivative = 1.66

method	result
derivativedivides	$-\frac{a^2\left(-\frac{1}{16(cx-1)^2}-\frac{5}{16(cx-1)}+\frac{3\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}-\frac{5}{16(cx+1)}-\frac{3\ln(cx+1)}{16}\right)}{d^3}-\frac{b^2\left(-\frac{15c^3x^3\arcsin(cx)^2-30\sqrt{-c^2x^2+1}\,\arcsin(}{}\right.}{}$
default	$-\frac{a^2\left(-\frac{1}{16(cx-1)^2}-\frac{5}{16(cx-1)}+\frac{3\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}-\frac{5}{16(cx+1)}-\frac{3\ln(cx+1)}{16}\right)}{d^3}-\frac{b^2\left(-\frac{15c^3x^3\arcsin(cx)^2-30\sqrt{-c^2x^2+1}\,\arcsin(}{}\right.}{}$
parts	$-\frac{a^2\left(-\frac{1}{16c^5(cx-1)^2}-\frac{5}{16c^5(cx-1)}+\frac{3\ln(cx-1)}{16c^5}+\frac{1}{16c^5(cx+1)^2}-\frac{5}{16c^5(cx+1)}-\frac{3\ln(cx+1)}{16c^5}\right)}{d^3}-\frac{b^2\left(-\frac{15c^3x^3\arcsin(cx)^2-30\sqrt{-c}}{}\right.}{}$

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(-a^2/d^3*(-1/16/(c*x-1)^2-5/16/(c*x-1)+3/16*ln(c*x-1)+1/16/(c*x+1)^2
-5/16/(c*x+1)-3/16*ln(c*x+1))-b^2/d^3*(-1/24*(15*c^3*x^3*arcsin(c*x)^2-30*(
-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-9*c*x*arcsin(c*x)^2-2*c^3*x^3+26*arcs
in(c*x)*(-c^2*x^2+1)^(1/2)+2*c*x)/(c^4*x^4-2*c^2*x^2+1)+3/8*arcsin(c*x)^2*l
n(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/4*I*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c
^2*x^2+1)^(1/2)))+3/4*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/8*arcsin(c
*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/4*I*arcsin(c*x)*polylog(2,I*(I*c
*x+(-c^2*x^2+1)^(1/2)))-3/4*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-7/3*I*a
rctan(I*c*x+(-c^2*x^2+1)^(1/2)))-2*a*b/d^3*(-1/24*(15*c^3*x^3*arcsin(c*x)-1
5*c^2*x^2*(-c^2*x^2+1)^(1/2)-9*c*x*arcsin(c*x)+13*(-c^2*x^2+1)^(1/2))/(c^4*
x^4-2*c^2*x^2+1)+3/8*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/8*arc
sin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/8*I*dilog(1+I*(I*c*x+(-c^2*x^
2+1)^(1/2)))+3/8*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^4}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
[Out] integral(-(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)/(c^6*d^
3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx$$
$$= -\frac{\int \frac{a^2x^4}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{b^2x^4\,\mathrm{asin}^2(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{2abx^4\,\mathrm{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
[Out] -(Integral(a**2*x**4/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Inte
gral(b**2*x**4*asin(c*x)**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x)
 + Integral(2*a*b*x**4*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1
), x))/d**3
```

Maxima [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^4}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
[Out] 1/16*a^2*(2*(5*c^2*x^3 - 3*x)/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3) + 3*l
og(c*x + 1)/(c^5*d^3) - 3*log(c*x - 1)/(c^5*d^3)) + 1/16*(3*(b^2*c^4*x^4 -
2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x +
 1) - 3*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))^2*log(-c*x + 1) + 2*(5*b^2*c^3*x^3 - 3*b^2*c*x)*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1))^2 + 16*(c^9*d^3*x^4 - 2*c^7*d^3*x^2 + c^5*d^3)*
integrate(-1/8*(16*a*b*c^4*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) -
 (3*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1))*log(c*x + 1) - 3*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) + 2*(5*b^2*c^3*x^3 - 3*b^2*c*x)*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(
c^10*d^3*x^6 - 3*c^8*d^3*x^4 + 3*c^6*d^3*x^2 - c^4*d^3), x))/(c^9*d^3*x^4 -
 2*c^7*d^3*x^2 + c^5*d^3)
```

Giac [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^4}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^4/(c^2*d*x^2 - d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int \frac{x^4\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^3}\,dx$$

```
[In] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3,x)
[Out] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3, x)
```

3.202 $\int \frac{x^3(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^3}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 172

$$\int \frac{x^3(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^3}\,dx=\frac{b^2}{12c^4d^3\left(1-c^2x^2\right)}-\frac{bx^3(a+b\arcsin(cx))}{6cd^3\left(1-c^2x^2\right)^{3/2}}+\frac{bx(a+b\arcsin(cx))}{2c^3d^3\sqrt{1-c^2x^2}}-\frac{(a+b\arcsin(cx))^2}{4c^4d^3}+\frac{x^4(a+b\arcsin(cx))^2}{4d^3\left(1-c^2x^2\right)^2}+\frac{b^2\log\left(1-c^2x^2\right)}{3c^4d^3}$$

```
[Out] 1/12*b^2/c^4/d^3/(-c^2*x^2+1)-1/6*b*x^3*(a+b*arcsin(c*x))/c/d^3/(-c^2*x^2+1
)^(3/2)-1/4*(a+b*arcsin(c*x))^2/c^4/d^3+1/4*x^4*(a+b*arcsin(c*x))^2/d^3/(-c
^2*x^2+1)^2+1/3*b^2*ln(-c^2*x^2+1)/c^4/d^3+1/2*b*x*(a+b*arcsin(c*x))/c^3/d^
3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4771, 4791, 4737, 266, 272, 45}

$$\int \frac{x^3(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^3}\,dx=-\frac{(a+b\arcsin(cx))^2}{4c^4d^3}+\frac{x^4(a+b\arcsin(cx))^2}{4d^3\left(1-c^2x^2\right)^2}-\frac{bx^3(a+b\arcsin(cx))}{6cd^3\left(1-c^2x^2\right)^{3/2}}+\frac{bx(a+b\arcsin(cx))}{2c^3d^3\sqrt{1-c^2x^2}}+\frac{b^2}{12c^4d^3\left(1-c^2x^2\right)}+\frac{b^2\log\left(1-c^2x^2\right)}{3c^4d^3}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] b^2/(12*c^4*d^3*(1 - c^2*x^2)) - (b*x^3*(a + b*ArcSin[c*x]))/(6*c*d^3*(1 -
c^2*x^2)^(3/2)) + (b*x*(a + b*ArcSin[c*x]))/(2*c^3*d^3*Sqrt[1 - c^2*x^2]) -
 (a + b*ArcSin[c*x])^2/(4*c^4*d^3) + (x^4*(a + b*ArcSin[c*x])^2)/(4*d^3*(1
- c^2*x^2)^2) + (b^2*Log[1 - c^2*x^2])/(3*c^4*d^3)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
```

```
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^4(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} - \frac{(bc)\int \frac{x^4(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{2d^3} \\
&= -\frac{bx^3(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} + \frac{x^4(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{b^2\int \frac{x^3}{(1-c^2x^2)^2}\,dx}{6d^3} + \frac{b\int \frac{x^2(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{2cd^3} \\
&= -\frac{bx^3(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} + \frac{bx(a+b\arcsin(cx))}{2c^3d^3\sqrt{1-c^2x^2}} + \frac{x^4(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} \\
&\quad + \frac{b^2\text{Subst}\left(\int \frac{x}{(1-c^2x)^2}\,dx, x, x^2\right)}{12d^3} - \frac{b\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2c^3d^3} - \frac{b^2\int \frac{x}{1-c^2x^2}\,dx}{2c^2d^3} \\
&= -\frac{bx^3(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} + \frac{bx(a+b\arcsin(cx))}{2c^3d^3\sqrt{1-c^2x^2}} \\
&\quad - \frac{(a+b\arcsin(cx))^2}{4c^4d^3} + \frac{x^4(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{b^2\log(1-c^2x^2)}{4c^4d^3} \\
&\quad + \frac{b^2\text{Subst}\left(\int \left(\frac{1}{c^2(-1+c^2x)^2} + \frac{1}{c^2(-1+c^2x)}\right)\,dx, x, x^2\right)}{12d^3} \\
&= \frac{b^2}{12c^4d^3(1-c^2x^2)} - \frac{bx^3(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} + \frac{bx(a+b\arcsin(cx))}{2c^3d^3\sqrt{1-c^2x^2}} \\
&\quad - \frac{(a+b\arcsin(cx))^2}{4c^4d^3} + \frac{x^4(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{b^2\log(1-c^2x^2)}{3c^4d^3}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.49 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.12

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \frac{-3a^2+b^2+6a^2c^2x^2-b^2c^2x^2+6abcx\sqrt{1-c^2x^2}-8abc^3x^3\sqrt{1-c^2x^2}+2b\left(bcx(3-4c^2x^2)\sqrt{1-c^2x^2}+a\right.}{12c^4d^3(-1+c^2x^2}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] (-3*a^2 + b^2 + 6*a^2*c^2*x^2 - b^2*c^2*x^2 + 6*a*b*c*x*Sqrt[1 - c^2*x^2] -
 8*a*b*c^3*x^3*Sqrt[1 - c^2*x^2] + 2*b*(b*c*x*(3 - 4*c^2*x^2)*Sqrt[1 - c^2*
x^2] + a*(-3 + 6*c^2*x^2))*ArcSin[c*x] + 3*b^2*(-1 + 2*c^2*x^2)*ArcSin[c*x]
^2 + 4*b^2*(-1 + c^2*x^2)^2*Log[1 - c^2*x^2])/(12*c^4*d^3*(-1 + c^2*x^2)^2)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.24 (sec) , antiderivative size = 386, normalized size of antiderivative = 2.24

method	result
derivativedivides	$-\frac{\frac{a^2\left(-\frac{1}{16(cx-1)^2}-\frac{3}{16(cx-1)}-\frac{1}{16(cx+1)^2}+\frac{3}{16(cx+1)}\right)}{d^3}-\frac{b^2\left(\frac{4i\arcsin(cx)}{3}-\frac{8i\arcsin(cx)x^4c^4-8\sqrt{-c^2x^2+1}\,\arcsin(cx)c^3x^3+6\arcsin}{}\right.}{}}{}$
default	$-\frac{\frac{a^2\left(-\frac{1}{16(cx-1)^2}-\frac{3}{16(cx-1)}-\frac{1}{16(cx+1)^2}+\frac{3}{16(cx+1)}\right)}{d^3}-\frac{b^2\left(\frac{4i\arcsin(cx)}{3}-\frac{8i\arcsin(cx)x^4c^4-8\sqrt{-c^2x^2+1}\,\arcsin(cx)c^3x^3+6\arcsin}{}\right.}{}}{}$
parts	$-\frac{a^2\left(-\frac{1}{16c^4(cx-1)^2}-\frac{3}{16c^4(cx-1)}-\frac{1}{16c^4(cx+1)^2}+\frac{3}{16c^4(cx+1)}\right)}{d^3}-\frac{b^2\left(\frac{4i\arcsin(cx)}{3}-\frac{8i\arcsin(cx)x^4c^4-8\sqrt{-c^2x^2+1}\,\arcsin(c}{}\right.}{}$

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(-a^2/d^3*(-1/16/(c*x-1)^2-3/16/(c*x-1)-1/16/(c*x+1)^2+3/16/(c*x+1))-
b^2/d^3*(4/3*I*arcsin(c*x)-1/12*(8*I*arcsin(c*x)*x^4*c^4-8*(-c^2*x^2+1)^(1/
2)*arcsin(c*x)*c^3*x^3+6*arcsin(c*x)^2*x^2*c^2-16*I*arcsin(c*x)*x^2*c^2+6*(
-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-3*arcsin(c*x)^2+8*I*arcsin(c*x)-c^2*x^2+1
)/(c^4*x^4-2*c^2*x^2+1)-2/3*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2))-2*a*b/d^3*(
-1/16*arcsin(c*x)/(c*x-1)^2-3/16*arcsin(c*x)/(c*x-1)-1/16*arcsin(c*x)/(c*x+
1)^2+3/16*arcsin(c*x)/(c*x+1)-1/48/(c*x+1)^2*(-(c*x+1)^2+2*c*x+2)^(1/2)+1/6
/(c*x+1)*(-(c*x+1)^2+2*c*x+2)^(1/2)+1/6/(c*x-1)*(-(c*x-1)^2-2*c*x+2)^(1/2)+
1/48/(c*x-1)^2*(-(c*x-1)^2-2*c*x+2)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 198, normalized size of antiderivative = 1.15

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx$$
$$=\frac{(6\,a^2-b^2)c^2x^2+3\,(2\,b^2c^2x^2-b^2)\arcsin{(cx)}^2-3\,a^2+b^2+6\,(2\,abc^2x^2-ab)\arcsin{(cx)}+4\,(b^2c^4x^4-2\,b^2c}{12\,(c^8d^3x^4-2\,c^6d^3x^2}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] 1/12*((6*a^2 - b^2)*c^2*x^2 + 3*(2*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - 3*a^2
 + b^2 + 6*(2*a*b*c^2*x^2 - a*b)*arcsin(c*x) + 4*(b^2*c^4*x^4 - 2*b^2*c^2*x
^2 + b^2)*log(c^2*x^2 - 1) - 2*(4*a*b*c^3*x^3 - 3*a*b*c*x + (4*b^2*c^3*x^3
- 3*b^2*c*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2
+ c^4*d^3)
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = -\frac{\int \frac{a^2x^3}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{b^2x^3\operatorname{asin}^2(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{2abx^3\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
[Out] -(Integral(a**2*x**3/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Inte
gral(b**2*x**3*asin(c*x)**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x)
 + Integral(2*a*b*x**3*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1
), x))/d**3
```

Maxima [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^3}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
[Out] 1/4*(2*c^2*x^2 - 1)*a^2/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^3) + 1/4*((2*b
^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 4*(c^8*d^3
*x^4 - 2*c^6*d^3*x^2 + c^4*d^3)*integrate(-1/2*(4*a*b*c^3*x^3*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1)) - (2*b^2*c^2*x^2 - b^2)*sqrt(c*x + 1)*sqrt(-c
*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^9*d^3*x^6 - 3*c^7*d^
3*x^4 + 3*c^5*d^3*x^2 - c^3*d^3), x))/(c^8*d^3*x^4 - 2*c^6*d^3*x^2 + c^4*d^
3)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 318 vs. $2(154) = 308$.

Time = 0.41 (sec) , antiderivative size = 318, normalized size of antiderivative = 1.85

$$\begin{aligned}\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx &= \frac{b^2x^4\arcsin(cx)^2}{4(c^2x^2-1)^2d^3} + \frac{abx^4\arcsin(cx)}{2(c^2x^2-1)^2d^3} + \frac{a^2x^4}{4(c^2x^2-1)^2d^3} \\ &+ \frac{b^2x^3\arcsin(cx)}{6(c^2x^2-1)\sqrt{-c^2x^2+1}cd^3} + \frac{abx^3}{6(c^2x^2-1)\sqrt{-c^2x^2+1}cd^3} \\ &- \frac{b^2x^2}{12(c^2x^2-1)c^2d^3} + \frac{b^2x\arcsin(cx)}{2\sqrt{-c^2x^2+1}c^3d^3} - \frac{b^2\arcsin(cx)^2}{4c^4d^3} \\ &+ \frac{abx}{2\sqrt{-c^2x^2+1}c^3d^3} - \frac{ab\arcsin(cx)}{2c^4d^3} + \frac{2b^2\log(2)}{3c^4d^3} \\ &+ \frac{b^2\log(|-c^2x^2+1|)}{3c^4d^3} - \frac{a^2}{4c^4d^3} + \frac{b^2}{12c^4d^3}\end{aligned}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] 1/4*b^2*x^4*arcsin(c*x)^2/((c^2*x^2 - 1)^2*d^3) + 1/2*a*b*x^4*arcsin(c*x)/(
(c^2*x^2 - 1)^2*d^3) + 1/4*a^2*x^4/((c^2*x^2 - 1)^2*d^3) + 1/6*b^2*x^3*arcs
in(c*x)/((c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*c*d^3) + 1/6*a*b*x^3/((c^2*x^2 -
1)*sqrt(-c^2*x^2 + 1)*c*d^3) - 1/12*b^2*x^2/((c^2*x^2 - 1)*c^2*d^3) + 1/2*b
^2*x*arcsin(c*x)/(sqrt(-c^2*x^2 + 1)*c^3*d^3) - 1/4*b^2*arcsin(c*x)^2/(c^4*
d^3) + 1/2*a*b*x/(sqrt(-c^2*x^2 + 1)*c^3*d^3) - 1/2*a*b*arcsin(c*x)/(c^4*d^
3) + 2/3*b^2*log(2)/(c^4*d^3) + 1/3*b^2*log(abs(-c^2*x^2 + 1))/(c^4*d^3) -
1/4*a^2/(c^4*d^3) + 1/12*b^2/(c^4*d^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx=\int \frac{x^3\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^3}\,dx$$

```
[In] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3,x)
```

```
[Out] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3, x)
```

3.203 $\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 341

$$\begin{aligned}\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = {} & \frac{b^2x}{12c^2d^3(1-c^2x^2)} - \frac{b(a+b\arcsin(cx))}{6c^3d^3(1-c^2x^2)^{3/2}} + \frac{b(a+b\arcsin(cx))}{4c^3d^3\sqrt{1-c^2x^2}} \\ & + \frac{x(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{x(a+b\arcsin(cx))^2}{8c^2d^3(1-c^2x^2)} \\ & + \frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4c^3d^3} - \frac{b^2\operatorname{arctanh}(cx)}{6c^3d^3} \\ & - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4c^3d^3} \\ & + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4c^3d^3} \\ & + \frac{b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4c^3d^3} - \frac{b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4c^3d^3}\end{aligned}$$

```
[Out] 1/12*b^2*x/c^2/d^3/(-c^2*x^2+1)-1/6*b*(a+b*arcsin(c*x))/c^3/d^3/(-c^2*x^2+1
)^(3/2)+1/4*x*(a+b*arcsin(c*x))^2/c^2/d^3/(-c^2*x^2+1)^2-1/8*x*(a+b*arcsin(
c*x))^2/c^2/d^3/(-c^2*x^2+1)+1/4*I*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x
^2+1)^(1/2))/c^3/d^3-1/6*b^2*arctanh(c*x)/c^3/d^3-1/4*I*b*(a+b*arcsin(c*x))
*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d^3+1/4*I*b*(a+b*arcsin(c*x))
*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^3/d^3+1/4*b^2*polylog(3,-I*(I*c*
x+(-c^2*x^2+1)^(1/2)))/c^3/d^3-1/4*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2
)))/c^3/d^3+1/4*b*(a+b*arcsin(c*x))/c^3/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 341, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.370, Rules used = {4791, 4747, 4749, 4266, 2611, 2320, 6724, 4767, 212, 205}

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \frac{i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{4c^3d^3} - \frac{ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4c^3d^3} + \frac{ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4c^3d^3} - \frac{x(a+b\arcsin(cx))^2}{8c^2d^3(1-c^2x^2)} + \frac{x(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} + \frac{b(a+b\arcsin(cx))}{4c^3d^3\sqrt{1-c^2x^2}} - \frac{b(a+b\arcsin(cx))}{6c^3d^3(1-c^2x^2)^{3/2}} + \frac{b^2\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4c^3d^3} - \frac{b^2\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4c^3d^3} - \frac{b^2\text{arctanh}(cx)}{6c^3d^3} + \frac{b^2x}{12c^2d^3(1-c^2x^2)}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] (b^2*x)/(12*c^2*d^3*(1 - c^2*x^2)) - (b*(a + b*ArcSin[c*x]))/(6*c^3*d^3*(1
- c^2*x^2)^(3/2)) + (b*(a + b*ArcSin[c*x]))/(4*c^3*d^3*Sqrt[1 - c^2*x^2]) +
 (x*(a + b*ArcSin[c*x])^2)/(4*c^2*d^3*(1 - c^2*x^2)^2) - (x*(a + b*ArcSin[c
*x])^2)/(8*c^2*d^3*(1 - c^2*x^2)) + ((I/4)*(a + b*ArcSin[c*x])^2*ArcTan[E^(
I*ArcSin[c*x])])/(c^3*d^3) - (b^2*ArcTanh[c*x])/(6*c^3*d^3) - ((I/4)*b*(a +
 b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^3*d^3) + ((I/4)*b*(a
 + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^3*d^3) + (b^2*PolyLog
[3, (-I)*E^(I*ArcSin[c*x])])/(4*c^3*d^3) - (b^2*PolyLog[3, I*E^(I*ArcSin[c*
x])])/(4*c^3*d^3)
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
```

```
Q[a, 0] || LtQ[b, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
```

```
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x(a+b\arcsin(cx))^2}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{b\int\frac{x(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{5/2}}\,dx}{2cd^3}-\frac{\int\frac{(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^2}\,dx}{4c^2d}\\
&= -\frac{b(a+b\arcsin(cx))}{6c^3d^3\left(1-c^2x^2\right)^{3/2}}+\frac{x(a+b\arcsin(cx))^2}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{x(a+b\arcsin(cx))^2}{8c^2d^3\left(1-c^2x^2\right)}\\
&\quad+\frac{b^2\int\frac{1}{\left(1-c^2x^2\right)^2}\,dx}{6c^2d^3}+\frac{b\int\frac{x(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{3/2}}\,dx}{4cd^3}-\frac{\int\frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{8c^2d^2}\\
&= \frac{b^2x}{12c^2d^3\left(1-c^2x^2\right)}-\frac{b(a+b\arcsin(cx))}{6c^3d^3\left(1-c^2x^2\right)^{3/2}}+\frac{b(a+b\arcsin(cx))}{4c^3d^3\sqrt{1-c^2x^2}}\\
&\quad+\frac{x(a+b\arcsin(cx))^2}{4c^2d^3\left(1-c^2x^2\right)^2}-\frac{x(a+b\arcsin(cx))^2}{8c^2d^3\left(1-c^2x^2\right)}\\
&\quad-\frac{\text{Subst}\left(\int(a+bx)^2\sec(x)\,dx,x,\arcsin(cx)\right)}{8c^3d^3}+\frac{b^2\int\frac{1}{1-c^2x^2}\,dx}{12c^2d^3}-\frac{b^2\int\frac{1}{1-c^2x^2}\,dx}{4c^2d^3}
\end{aligned}$$

$$= \frac{b^2x}{12c^2d^3(1-c^2x^2)} - \frac{b(a+b\arcsin(cx))}{6c^3d^3(1-c^2x^2)^{3/2}} + \frac{b(a+b\arcsin(cx))}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{x(a+b\arcsin(cx))^2}{8c^2d^3(1-c^2x^2)} + \frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4c^3d^3} - \frac{b^2\text{arctanh}(cx)}{6c^3d^3} + \frac{b\text{Subst}\left(\int(a+bx)\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{4c^3d^3} - \frac{b\text{Subst}\left(\int(a+bx)\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{4c^3d^3}$$

$$= \frac{b^2x}{12c^2d^3(1-c^2x^2)} - \frac{b(a+b\arcsin(cx))}{6c^3d^3(1-c^2x^2)^{3/2}} + \frac{b(a+b\arcsin(cx))}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{x(a+b\arcsin(cx))^2}{8c^2d^3(1-c^2x^2)} + \frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4c^3d^3} - \frac{b^2\text{arctanh}(cx)}{6c^3d^3} - \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4c^3d^3} + \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4c^3d^3} + \frac{(ib^2)\,\text{Subst}\left(\int\text{PolyLog}\left(2,-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{4c^3d^3} - \frac{(ib^2)\,\text{Subst}\left(\int\text{PolyLog}\left(2,ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{4c^3d^3}$$

$$= \frac{b^2x}{12c^2d^3(1-c^2x^2)} - \frac{b(a+b\arcsin(cx))}{6c^3d^3(1-c^2x^2)^{3/2}} + \frac{b(a+b\arcsin(cx))}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{x(a+b\arcsin(cx))^2}{8c^2d^3(1-c^2x^2)} + \frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4c^3d^3} - \frac{b^2\text{arctanh}(cx)}{6c^3d^3} - \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4c^3d^3} + \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4c^3d^3} + \frac{b^2\text{Subst}\left(\int\frac{\text{PolyLog}(2,-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{4c^3d^3} - \frac{b^2\text{Subst}\left(\int\frac{\text{PolyLog}(2,ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{4c^3d^3}$$

$$
= \frac{b^2x}{12c^2d^3(1-c^2x^2)} - \frac{b(a+b\arcsin(cx))}{6c^3d^3(1-c^2x^2)^{3/2}} + \frac{b(a+b\arcsin(cx))}{4c^3d^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{x(a+b\arcsin(cx))^2}{8c^2d^3(1-c^2x^2)} + \frac{i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4c^3d^3} - \frac{b^2\operatorname{arctanh}(cx)}{6c^3d^3} - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4c^3d^3} + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4c^3d^3} + \frac{b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4c^3d^3} - \frac{b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4c^3d^3}
$$

Mathematica [A] (verified)

Time = 5.33 (sec) , antiderivative size = 670, normalized size of antiderivative = 1.96

$$
\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \frac{\frac{4a^2cx}{(-1+c^2x^2)^2} + \frac{2a^2cx}{-1+c^2x^2} - \frac{2ab\left(\sqrt{1-c^2x^2}-\arcsin(cx)\right)}{-1+cx} + \frac{2ab\left(\sqrt{1-c^2x^2}+\arcsin(cx)\right)}{1+cx} + \frac{2ab\left((-2+cx)\sqrt{1-c^2x^2}+3\arcsin(cx)\right)}{3(-1+cx)^2} - \frac{2ab((2}{}
$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] ((4*a^2*c*x)/(-1 + c^2*x^2)^2 + (2*a^2*c*x)/(-1 + c^2*x^2) - (2*a*b*(Sqrt[1
 - c^2*x^2] - ArcSin[c*x]))/(-1 + c*x) + (2*a*b*(Sqrt[1 - c^2*x^2] + ArcSin
[c*x]))/(1 + c*x) + (2*a*b*((-2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x]))/
(3*(-1 + c*x)^2) - (2*a*b*((2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x]))/(3
*(1 + c*x)^2) + a^2*Log[1 - c*x] - a^2*Log[1 + c*x] + a*b*((-I)*ArcSin[c*x]
^2 + ArcSin[c*x]*((3*I)*Pi + 4*Log[1 + I*E^(I*ArcSin[c*x])]) + 2*Pi*(2*Log[
1 + E^((-I)*ArcSin[c*x])] - Log[1 + I*E^(I*ArcSin[c*x])] - 2*Log[Cos[ArcSin
[c*x]/2]] + Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]) - (4*I)*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])]) + a*b*(I*ArcSin[c*x]^2 + ArcSin[c*x]*((-I)*Pi - 4*Log[1 - I
*E^(I*ArcSin[c*x])]) + 2*Pi*(-2*Log[1 + E^((-I)*ArcSin[c*x])] - Log[1 - I*E
^(I*ArcSin[c*x])] + 2*Log[Cos[ArcSin[c*x]/2]] + Log[Sin[(Pi + 2*ArcSin[c*x]
)/4]]) + (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]) + (4*b^2*((3*I)*ArcSin[c*x]
^2*ArcTan[E^(I*ArcSin[c*x])] - 2*ArcTanh[c*x] - (3*I)*ArcSin[c*x]*PolyLog[2
, (-I)*E^(I*ArcSin[c*x])] + (3*I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x]
)] + 3*PolyLog[3, (-I)*E^(I*ArcSin[c*x])] - 3*PolyLog[3, I*E^(I*ArcSin[c*x]
)]))/3 + (b^2*(2*ArcSin[c*x]*(Sqrt[1 - c^2*x^2] + 3*Cos[3*ArcSin[c*x]]) - 3
*ArcSin[c*x]^2*(-7*c*x + Sin[3*ArcSin[c*x]]) + 2*(c*x + Sin[3*ArcSin[c*x]])
))/(6*(-1 + c^2*x^2)^2))/(16*c^3*d^3)
```

Maple [A] (verified)

Time = 0.40 (sec) , antiderivative size = 568, normalized size of antiderivative = 1.67

method	result
derivativedivides	$-\frac{a^2\left(-\frac{1}{16(cx-1)^2}-\frac{1}{16(cx-1)}-\frac{\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}-\frac{1}{16(cx+1)}+\frac{\ln(cx+1)}{16}\right)}{d^3}-\frac{b^2\left(-\frac{3c^3x^3\arcsin(cx)^2-6\sqrt{-c^2x^2+1}\,\arcsin(cx)}{24}\right.}{}$
default	$-\frac{a^2\left(-\frac{1}{16(cx-1)^2}-\frac{1}{16(cx-1)}-\frac{\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}-\frac{1}{16(cx+1)}+\frac{\ln(cx+1)}{16}\right)}{d^3}-\frac{b^2\left(-\frac{3c^3x^3\arcsin(cx)^2-6\sqrt{-c^2x^2+1}\,\arcsin(cx)}{24}\right.}{}$
parts	$-\frac{a^2\left(-\frac{1}{16c^3(cx-1)^2}-\frac{1}{16c^3(cx-1)}-\frac{\ln(cx-1)}{16c^3}+\frac{1}{16c^3(cx+1)^2}-\frac{1}{16c^3(cx+1)}+\frac{\ln(cx+1)}{16c^3}\right)}{d^3}-\frac{b^2\left(-\frac{3c^3x^3\arcsin(cx)^2-6\sqrt{-c^2x^2}}{}\right.}{}$

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^3*(-a^2/d^3*(-1/16/(c*x-1)^2-1/16/(c*x-1)-1/16*ln(c*x-1)+1/16/(c*x+1)^2
-1/16/(c*x+1)+1/16*ln(c*x+1))-b^2/d^3*(-1/24*(3*c^3*x^3*arcsin(c*x)^2-6*(-c
^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2+3*c*x*arcsin(c*x)^2-2*c^3*x^3+2*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)+2*c*x)/(c^4*x^4-2*c^2*x^2+1)-1/8*arcsin(c*x)^2*ln(1
+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/4*I*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*
x^2+1)^(1/2)))-1/4*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/8*arcsin(c*x)
^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/4*I*arcsin(c*x)*polylog(2,I*(I*c*x+
(-c^2*x^2+1)^(1/2)))+1/4*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-1/3*I*arct
an(I*c*x+(-c^2*x^2+1)^(1/2)))-2*a*b/d^3*(-1/24*(3*c^3*x^3*arcsin(c*x)-3*c^2
*x^2*(-c^2*x^2+1)^(1/2)+3*c*x*arcsin(c*x)+(-c^2*x^2+1)^(1/2))/(c^4*x^4-2*c^
2*x^2+1)-1/8*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/8*arcsin(c*x)
*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+1/8*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/
2)))-1/8*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^2}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)/(c^6*d^
3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = -\frac{\int \frac{a^2x^2}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{b^2x^2\operatorname{asin}^2(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{2abx^2\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2*x**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Inte
gral(b**2*x**2*asin(c*x)**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x)
 + Integral(2*a*b*x**2*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1
), x))/d**3
```

Maxima [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^2}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/16*a^2*(2*(c^2*x^3 + x)/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3) - log(c*x
 + 1)/(c^3*d^3) + log(c*x - 1)/(c^3*d^3)) - 1/16*((b^2*c^4*x^4 - 2*b^2*c^2*
x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - (b^2
*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^
2*log(-c*x + 1) - 2*(b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))^2 + 16*(c^7*d^3*x^4 - 2*c^5*d^3*x^2 + c^3*d^3)*integrate(1/8*(1
6*a*b*c^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + ((b^2*c^4*x^4 -
2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1
) - (b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1))*log(-c*x + 1) - 2*(b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^8*d^3*x^6 - 3*c^6*d^3*x
^4 + 3*c^4*d^3*x^2 - c^2*d^3), x))/(c^7*d^3*x^4 - 2*c^5*d^3*x^2 + c^3*d^3)
```

Giac [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^2}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^2/(c^2*d*x^2 - d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^3}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3,x)
[Out] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3, x)
```

3.204 $\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3} dx$

Optimal result

Integrand size = 25, antiderivative size = 150

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3} dx = \frac{b^2}{12c^2d^3(1-c^2x^2)} - \frac{bx(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{bx(a+b\arcsin(cx))}{3cd^3\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{b^2\log(1-c^2x^2)}{6c^2d^3}$$

```
[Out] 1/12*b^2/c^2/d^3/(-c^2*x^2+1)-1/6*b*x*(a+b*arcsin(c*x))/c/d^3/(-c^2*x^2+1)^
(3/2)+1/4*(a+b*arcsin(c*x))^2/c^2/d^3/(-c^2*x^2+1)^2-1/6*b^2*ln(-c^2*x^2+1)
/c^2/d^3-1/3*b*x*(a+b*arcsin(c*x))/c/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4767, 4747, 4745, 266, 267}

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3} dx = -\frac{bx(a+b\arcsin(cx))}{3cd^3\sqrt{1-c^2x^2}} - \frac{bx(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} + \frac{(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} + \frac{b^2}{12c^2d^3(1-c^2x^2)} - \frac{b^2\log(1-c^2x^2)}{6c^2d^3}$$

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] b^2/(12*c^2*d^3*(1 - c^2*x^2)) - (b*x*(a + b*ArcSin[c*x]))/(6*c*d^3*(1 - c^
2*x^2)^(3/2)) - (b*x*(a + b*ArcSin[c*x]))/(3*c*d^3*Sqrt[1 - c^2*x^2]) + (a
+ b*ArcSin[c*x])^2/(4*c^2*d^3*(1 - c^2*x^2)^2) - (b^2*Log[1 - c^2*x^2])/(6*
c^2*d^3)
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\text{integral} = \frac{(a+b\arcsin(cx))^2}{4c^2d^3\left(1-c^2x^2\right)^2} - \frac{b\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^{5/2}}\,dx}{2cd^3}$$

$$= -\frac{bx(a+b\arcsin(cx))}{6cd^3\left(1-c^2x^2\right)^{3/2}} + \frac{(a+b\arcsin(cx))^2}{4c^2d^3\left(1-c^2x^2\right)^2} + \frac{b^2\int \frac{x}{(1-c^2x^2)^2}\,dx}{6d^3} - \frac{b\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^{3/2}}\,dx}{3cd^3}$$

$$= \frac{b^2}{12c^2d^3(1-c^2x^2)} - \frac{bx(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{bx(a+b\arcsin(cx))}{3cd^3\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} + \frac{b^2\int\frac{x}{1-c^2x^2}\,dx}{3d^3}$$

$$= \frac{b^2}{12c^2d^3(1-c^2x^2)} - \frac{bx(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{bx(a+b\arcsin(cx))}{3cd^3\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{4c^2d^3(1-c^2x^2)^2} - \frac{b^2\log(1-c^2x^2)}{6c^2d^3}$$

Mathematica [A] (verified)

Time = 0.94 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.08

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \frac{3a^2+b^2-b^2c^2x^2-6abcx\sqrt{1-c^2x^2}+4abc^3x^3\sqrt{1-c^2x^2}+2b\left(3a+bcx\sqrt{1-c^2x^2}(-3+2c^2x^2)\right)\arcsin(cx}{12c^2d^3(-1+c^2x^2)^2}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] (3*a^2 + b^2 - b^2*c^2*x^2 - 6*a*b*c*x*Sqrt[1 - c^2*x^2] + 4*a*b*c^3*x^3*Sq
rt[1 - c^2*x^2] + 2*b*(3*a + b*c*x*Sqrt[1 - c^2*x^2]*(-3 + 2*c^2*x^2))*ArcS
in[c*x] + 3*b^2*ArcSin[c*x]^2 - 2*b^2*(-1 + c^2*x^2)^2*Log[1 - c^2*x^2])/(1
2*c^2*d^3*(-1 + c^2*x^2)^2)
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.80

method	result
derivativedivides	$\frac{\frac{a^2}{4d^3(c^2x^2-1)^2} - \frac{b^2\left(-\frac{\arcsin(cx)^2}{4(c^2x^2-1)^2}+\frac{\arcsin(cx)cx\sqrt{-c^2x^2+1}}{6(c^2x^2-1)^2}+\frac{1}{12c^2x^2-12}-\frac{\sqrt{-c^2x^2+1}\,\arcsin(cx)cx}{3(c^2x^2-1)}+\frac{\ln(-c^2x^2+1)}{6}\right)}{d^3} - \frac{2ab\left(-\ldots\right.}{4\ldots}}{c^2}$
default	$\frac{\frac{a^2}{4d^3(c^2x^2-1)^2} - \frac{b^2\left(-\frac{\arcsin(cx)^2}{4(c^2x^2-1)^2}+\frac{\arcsin(cx)cx\sqrt{-c^2x^2+1}}{6(c^2x^2-1)^2}+\frac{1}{12c^2x^2-12}-\frac{\sqrt{-c^2x^2+1}\,\arcsin(cx)cx}{3(c^2x^2-1)}+\frac{\ln(-c^2x^2+1)}{6}\right)}{d^3} - \frac{2ab\left(-\ldots\right.}{4\ldots}}{c^2}$
parts	$\frac{a^2}{4d^3c^2(c^2x^2-1)^2} - \frac{b^2\left(-\frac{\arcsin(cx)^2}{4(c^2x^2-1)^2}+\frac{\arcsin(cx)cx\sqrt{-c^2x^2+1}}{6(c^2x^2-1)^2}+\frac{1}{12c^2x^2-12}-\frac{\sqrt{-c^2x^2+1}\,\arcsin(cx)cx}{3(c^2x^2-1)}+\frac{\ln(-c^2x^2+1)}{6}\right)}{d^3c^2} - \ldots$

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(1/4*a^2/d^3/(c^2*x^2-1)^2-b^2/d^3*(-1/4/(c^2*x^2-1)^2*arcsin(c*x)^2+
1/6*arcsin(c*x)*c*x*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)^2+1/12/(c^2*x^2-1)-1/3*(
-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)*c*x+1/6*ln(-c^2*x^2+1))-2*a*b/d^3
*(-1/4/(c^2*x^2-1)^2*arcsin(c*x)-1/48/(c*x+1)^2*(-(c*x+1)^2+2*c*x+2)^(1/2)-
1/12/(c*x+1)*(-(c*x+1)^2+2*c*x+2)^(1/2)-1/12/(c*x-1)*(-(c*x-1)^2-2*c*x+2)^(
1/2)+1/48/(c*x-1)^2*(-(c*x-1)^2-2*c*x+2)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 165, normalized size of antiderivative = 1.10

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = -\frac{b^2c^2x^2 - 3\,b^2\arcsin(cx)^2 - 6\,ab\arcsin(cx) - 3\,a^2 - b^2 + 2\,(b^2c^4x^4 - 2\,b^2c^2x^2 + b^2)\log(c^2x^2 - 1) - 2\,(2}{12\,(c^6d^3x^4 - 2\,c^4d^3x^2 + c^2d^3)}$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] -1/12*(b^2*c^2*x^2 - 3*b^2*arcsin(c*x)^2 - 6*a*b*arcsin(c*x) - 3*a^2 - b^2
+ 2*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*log(c^2*x^2 - 1) - 2*(2*a*b*c^3*x^3
 - 3*a*b*c*x + (2*b^2*c^3*x^3 - 3*b^2*c*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))
/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = -\frac{\int \frac{a^2x}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{b^2x\operatorname{asin}^2(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx + \int \frac{2abx\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2*x/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Integra
l(b**2*x*asin(c*x)**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Int
egral(2*a*b*x*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x))/d*
*3
```

Maxima [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*a^2/(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3) + 1/4*(b^2*arctan2(c*x, sqr
t(c*x + 1)*sqrt(-c*x + 1))^2 + 4*(c^6*d^3*x^4 - 2*c^4*d^3*x^2 + c^2*d^3)*in
tegrate(-1/2*(4*a*b*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - sqrt(c
*x + 1)*sqrt(-c*x + 1)*b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^7
*d^3*x^6 - 3*c^5*d^3*x^4 + 3*c^3*d^3*x^2 - c*d^3), x))/(c^6*d^3*x^4 - 2*c^4
*d^3*x^2 + c^2*d^3)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 395 vs. $2(134) = 268$.

Time = 0.36 (sec) , antiderivative size = 395, normalized size of antiderivative = 2.63

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \frac{b^2c^2x^4\arcsin(cx)^2}{4(c^2x^2-1)^2d^3} + \frac{abc^2x^4\arcsin(cx)}{2(c^2x^2-1)^2d^3} + \frac{a^2c^2x^4}{4(c^2x^2-1)^2d^3} + \frac{b^2cx^3\arcsin(cx)}{6(c^2x^2-1)\sqrt{-c^2x^2+1}d^3} - \frac{b^2x^2\arcsin(cx)^2}{2(c^2x^2-1)d^3} + \frac{abcx^3}{6(c^2x^2-1)\sqrt{-c^2x^2+1}d^3} - \frac{abx^2\arcsin(cx)}{(c^2x^2-1)d^3} - \frac{a^2x^2}{2(c^2x^2-1)d^3} - \frac{b^2x^2}{12(c^2x^2-1)d^3} - \frac{b^2x\arcsin(cx)}{2\sqrt{-c^2x^2+1}cd^3} + \frac{b^2\arcsin(cx)^2}{4c^2d^3} - \frac{abx}{2\sqrt{-c^2x^2+1}cd^3} + \frac{ab\arcsin(cx)}{2c^2d^3} - \frac{b^2\log(2)}{3c^2d^3} - \frac{b^2\log(|-c^2x^2+1|)}{6c^2d^3} + \frac{a^2}{4c^2d^3} + \frac{b^2}{12c^2d^3}$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] 1/4*b^2*c^2*x^4*arcsin(c*x)^2/((c^2*x^2 - 1)^2*d^3) + 1/2*a*b*c^2*x^4*arcsi
n(c*x)/((c^2*x^2 - 1)^2*d^3) + 1/4*a^2*c^2*x^4/((c^2*x^2 - 1)^2*d^3) + 1/6*
b^2*c*x^3*arcsin(c*x)/((c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*d^3) - 1/2*b^2*x^2*
arcsin(c*x)^2/((c^2*x^2 - 1)*d^3) + 1/6*a*b*c*x^3/((c^2*x^2 - 1)*sqrt(-c^2*
x^2 + 1)*d^3) - a*b*x^2*arcsin(c*x)/((c^2*x^2 - 1)*d^3) - 1/2*a^2*x^2/((c^2
*x^2 - 1)*d^3) - 1/12*b^2*x^2/((c^2*x^2 - 1)*d^3) - 1/2*b^2*x*arcsin(c*x)/(
sqrt(-c^2*x^2 + 1)*c*d^3) + 1/4*b^2*arcsin(c*x)^2/(c^2*d^3) - 1/2*a*b*x/(sq
rt(-c^2*x^2 + 1)*c*d^3) + 1/2*a*b*arcsin(c*x)/(c^2*d^3) - 1/3*b^2*log(2)/(c
^2*d^3) - 1/6*b^2*log(abs(-c^2*x^2 + 1))/(c^2*d^3) + 1/4*a^2/(c^2*d^3) + 1/
12*b^2/(c^2*d^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx=\int \frac{x\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^3}\,dx$$

```
[In] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3,x)
[Out] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3, x)
```

3.205 $\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 332

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx &= \frac{b^2x}{12d^3(1-c^2x^2)}-\frac{b(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}}-\frac{3b(a+b\arcsin(cx))}{4cd^3\sqrt{1-c^2x^2}}\\&\quad+\frac{x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2}+\frac{3x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)}\\&\quad-\frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4cd^3}+\frac{5b^2\operatorname{arctanh}(cx)}{6cd^3}\\&\quad+\frac{3ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4cd^3}\\&\quad-\frac{3ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4cd^3}\\&\quad-\frac{3b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4cd^3}+\frac{3b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4cd^3}\end{aligned}$$

```
[Out] 1/12*b^2*x/d^3/(-c^2*x^2+1)-1/6*b*(a+b*arcsin(c*x))/c/d^3/(-c^2*x^2+1)^(3/2
)+1/4*x*(a+b*arcsin(c*x))^2/d^3/(-c^2*x^2+1)^2+3/8*x*(a+b*arcsin(c*x))^2/d^
3/(-c^2*x^2+1)-3/4*I*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c
/d^3+5/6*b^2*arctanh(c*x)/c/d^3+3/4*I*b*(a+b*arcsin(c*x))*polylog(2,-I*(I*c
*x+(-c^2*x^2+1)^(1/2)))/c/d^3-3/4*I*b*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+
(-c^2*x^2+1)^(1/2)))/c/d^3-3/4*b^2*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
/c/d^3+3/4*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^3-3/4*b*(a+b*arc
sin(c*x))/c/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 332, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4747, 4749, 4266, 2611, 2320, 6724, 4767, 212, 205}

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = -\frac{3i\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{4cd^3} - \frac{3b(a+b\arcsin(cx))}{4cd^3\sqrt{1-c^2x^2}} - \frac{b(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} + \frac{3x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} + \frac{x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{3ib\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4cd^3} - \frac{3ib\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4cd^3} - \frac{3b^2\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4cd^3} + \frac{3b^2\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4cd^3} + \frac{5b^2\text{arctanh}(cx)}{6cd^3} + \frac{b^2x}{12d^3(1-c^2x^2)}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^3,x]
```

```
[Out] (b^2*x)/(12*d^3*(1 - c^2*x^2)) - (b*(a + b*ArcSin[c*x]))/(6*c*d^3*(1 - c^2*
x^2)^(3/2)) - (3*b*(a + b*ArcSin[c*x]))/(4*c*d^3*Sqrt[1 - c^2*x^2]) + (x*(a
 + b*ArcSin[c*x])^2)/(4*d^3*(1 - c^2*x^2)^2) + (3*x*(a + b*ArcSin[c*x])^2)/
(8*d^3*(1 - c^2*x^2)) - (((3*I)/4)*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin
[c*x])])/(c*d^3) + (5*b^2*ArcTanh[c*x])/(6*c*d^3) + (((3*I)/4)*b*(a + b*Arc
Sin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*d^3) - (((3*I)/4)*b*(a + b
*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d^3) - (3*b^2*PolyLog[3,
(-I)*E^(I*ArcSin[c*x])])/(4*c*d^3) + (3*b^2*PolyLog[3, I*E^(I*ArcSin[c*x])]
)/(4*c*d^3)
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
```

```
Q[a, 0] || LtQ[b, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
```

```
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} - \frac{(bc)\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{2d^3} + \frac{3\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx}{4d} \\
&= -\frac{b(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} + \frac{x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{3x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} \\
&\quad + \frac{b^2\int \frac{1}{(1-c^2x^2)^2}\,dx}{6d^3} - \frac{(3bc)\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{4d^3} + \frac{3\int \frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{8d^2} \\
&= \frac{b^2x}{12d^3(1-c^2x^2)} - \frac{b(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{3b(a+b\arcsin(cx))}{4cd^3\sqrt{1-c^2x^2}} \\
&\quad + \frac{x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{3x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} + \frac{b^2\int \frac{1}{1-c^2x^2}\,dx}{12d^3} \\
&\quad + \frac{(3b^2)\int \frac{1}{1-c^2x^2}\,dx}{4d^3} + \frac{3\text{Subst}\left(\int (a+bx)^2\sec(x)\,dx, x, \arcsin(cx)\right)}{8cd^3} \\
&= \frac{b^2x}{12d^3(1-c^2x^2)} - \frac{b(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{3b(a+b\arcsin(cx))}{4cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} \\
&\quad + \frac{3x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} - \frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4cd^3} \\
&\quad + \frac{5b^2\text{arctanh}(cx)}{6cd^3} - \frac{(3b)\text{Subst}\left(\int (a+bx)\log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{4cd^3} \\
&\quad + \frac{(3b)\text{Subst}\left(\int (a+bx)\log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{4cd^3}
\end{aligned}$$

$$= \frac{b^2 x}{12d^3(1-c^2x^2)} - \frac{b(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{3b(a+b\arcsin(cx))}{4cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{3x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} - \frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4cd^3} + \frac{5b^2\operatorname{arctanh}(cx)}{6cd^3} + \frac{3ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4cd^3} - \frac{3ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4cd^3} - \frac{(3ib^2)\operatorname{Subst}\left(\int \operatorname{PolyLog}(2,-ie^{ix})\,dx,x,\arcsin(cx)\right)}{4cd^3} + \frac{(3ib^2)\operatorname{Subst}\left(\int \operatorname{PolyLog}(2,ie^{ix})\,dx,x,\arcsin(cx)\right)}{4cd^3}$$

$$= \frac{b^2 x}{12d^3(1-c^2x^2)} - \frac{b(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{3b(a+b\arcsin(cx))}{4cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{3x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} - \frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4cd^3} + \frac{5b^2\operatorname{arctanh}(cx)}{6cd^3} + \frac{3ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4cd^3} - \frac{3ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4cd^3} - \frac{(3b^2)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{4cd^3} + \frac{(3b^2)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{4cd^3}$$

$$= \frac{b^2 x}{12d^3(1-c^2x^2)} - \frac{b(a+b\arcsin(cx))}{6cd^3(1-c^2x^2)^{3/2}} - \frac{3b(a+b\arcsin(cx))}{4cd^3\sqrt{1-c^2x^2}} + \frac{x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{3x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} - \frac{3i(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4cd^3} + \frac{5b^2\operatorname{arctanh}(cx)}{6cd^3} + \frac{3ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4cd^3} - \frac{3ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4cd^3} - \frac{3b^2\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4cd^3} + \frac{3b^2\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4cd^3}$$

Mathematica [A] (verified)

Time = 4.06 (sec) , antiderivative size = 660, normalized size of antiderivative = 1.99

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx =$$

$$-\frac{-\frac{12a^2x}{(-1+c^2x^2)^2}+\frac{18a^2x}{-1+c^2x^2}+\frac{9a^2\log(1-cx)}{c}-\frac{9a^2\log(1+cx)}{c}+\frac{2ab\left(\frac{2\sqrt{1-c^2x^2}}{(-1+cx)^2}-\frac{cx\sqrt{1-c^2x^2}}{(-1+cx)^2}-\frac{9\sqrt{1-c^2x^2}}{-1+cx}+\frac{2\sqrt{1-c^2x^2}}{(1+cx)^2}+\frac{cx\sqrt{1-c^2x^2}}{(1+cx)^2}+\right.}{}}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/48*((-12*a^2*x)/(-1 + c^2*x^2)^2 + (18*a^2*x)/(-1 + c^2*x^2) + (9*a^2*Lo
g[1 - c*x])/c - (9*a^2*Log[1 + c*x])/c + (2*a*b*((2*Sqrt[1 - c^2*x^2])/(-1
+ c*x)^2 - (c*x*Sqrt[1 - c^2*x^2])/(-1 + c*x)^2 - (9*Sqrt[1 - c^2*x^2])/(-1
 + c*x) + (2*Sqrt[1 - c^2*x^2])/(1 + c*x)^2 + (c*x*Sqrt[1 - c^2*x^2])/(1 +
c*x)^2 + (9*Sqrt[1 - c^2*x^2])/(1 + c*x) + (9*I)*Pi*ArcSin[c*x] - (3*ArcSin
[c*x])/(-1 + c*x)^2 + (9*ArcSin[c*x])/(-1 + c*x) + (3*ArcSin[c*x])/(1 + c*x
)^2 + (9*ArcSin[c*x])/(1 + c*x) - 9*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 18*Ar
cSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 9*Pi*Log[1 + I*E^(I*ArcSin[c*x])]
+ 18*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 9*Pi*Log[-Cos[(Pi + 2*ArcSi
n[c*x])/4]] + 9*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (18*I)*PolyLog[2, (-I
)*E^(I*ArcSin[c*x])] + (18*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]))/c + (2*b^2*
((2*c*x)/(-1 + c^2*x^2) + (4*ArcSin[c*x])/(1 - c^2*x^2)^(3/2) + (18*ArcSin[
c*x])/Sqrt[1 - c^2*x^2] - (6*c*x*ArcSin[c*x]^2)/(-1 + c^2*x^2)^2 + (9*c*x*A
rcSin[c*x]^2)/(-1 + c^2*x^2) + (18*I)*ArcSin[c*x]^2*ArcTan[E^(I*ArcSin[c*x]
)] - 20*ArcTanh[c*x] - (18*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])
] + (18*I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] + 18*PolyLog[3, (-I)
*E^(I*ArcSin[c*x])] - 18*PolyLog[3, I*E^(I*ArcSin[c*x])]))/c)/d^3
```

Maple [A] (verified)

Time = 0.42 (sec) , antiderivative size = 570, normalized size of antiderivative = 1.72

method	result
derivativedivides	$-\frac{a^2\left(-\frac{1}{16(cx-1)^2}+\frac{3}{16(cx-1)}+\frac{3\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}+\frac{3}{16(cx+1)}-\frac{3\ln(cx+1)}{16}\right)}{d^3}-\frac{b^2\left(\frac{9c^3x^3\arcsin(cx)^2-18\sqrt{-c^2x^2+1}\,\arcsin(c\right.}{}}{}$
default	$-\frac{a^2\left(-\frac{1}{16(cx-1)^2}+\frac{3}{16(cx-1)}+\frac{3\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}+\frac{3}{16(cx+1)}-\frac{3\ln(cx+1)}{16}\right)}{d^3}-\frac{b^2\left(\frac{9c^3x^3\arcsin(cx)^2-18\sqrt{-c^2x^2+1}\,\arcsin(c\right.}{}}{}$
parts	$-\frac{a^2\left(-\frac{1}{16c(cx-1)^2}+\frac{3}{16c(cx-1)}+\frac{3\ln(cx-1)}{16c}+\frac{1}{16c(cx+1)^2}+\frac{3}{16c(cx+1)}-\frac{3\ln(cx+1)}{16c}\right)}{d^3}-\frac{b^2\left(\frac{9c^3x^3\arcsin(cx)^2-18\sqrt{-c^2x^2+\right.}{}}{}$

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-a^2/d^3*(-1/16/(c*x-1)^2+3/16/(c*x-1)+3/16*ln(c*x-1)+1/16/(c*x+1)^2+3
/16/(c*x+1)-3/16*ln(c*x+1))-b^2/d^3*(1/24*(9*c^3*x^3*arcsin(c*x)^2-18*(-c^2
*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-15*c*x*arcsin(c*x)^2+2*c^3*x^3+22*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)-2*c*x)/(c^4*x^4-2*c^2*x^2+1)+3/8*arcsin(c*x)^2*ln(1
+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/4*I*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*
x^2+1)^(1/2)))+3/4*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/8*arcsin(c*x)
^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+3/4*I*arcsin(c*x)*polylog(2,I*(I*c*x+
(-c^2*x^2+1)^(1/2)))-3/4*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+5/3*I*arct
an(I*c*x+(-c^2*x^2+1)^(1/2)))-2*a*b/d^3*(1/24*(9*c^3*x^3*arcsin(c*x)-9*c^2*
x^2*(-c^2*x^2+1)^(1/2)-15*c*x*arcsin(c*x)+11*(-c^2*x^2+1)^(1/2))/(c^4*x^4-2
*c^2*x^2+1)+3/8*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/8*arcsin(c
*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-3/8*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^
(1/2)))+3/8*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin{(cx)}+a)^2}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^6 - 3*c^
4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin{(cx)}+a)^2}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/16*a^2*(2*(3*c^2*x^3 - 5*x)/(c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3) - 3*log(
c*x + 1)/(c*d^3) + 3*log(c*x - 1)/(c*d^3)) + 1/16*(3*(b^2*c^4*x^4 - 2*b^2*c
^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 3
*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))^2*log(-c*x + 1) - 2*(3*b^2*c^3*x^3 - 5*b^2*c*x)*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))^2 + 16*(c^5*d^3*x^4 - 2*c^3*d^3*x^2 + c*d^3)*integrate
(-1/8*(16*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (3*(b^2*c^4*x^4
- 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x +
 1) - 3*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))*log(-c*x + 1) - 2*(3*b^2*c^3*x^3 - 5*b^2*c*x)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^6 - 3*c
^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x))/(c^5*d^3*x^4 - 2*c^3*d^3*x^2 + c*d^3
)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin{(cx)}+a)^2}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2/(c^2*d*x^2 - d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^3}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^3,x)
```

```
[Out] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^3, x)
```

3.206 $\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 296

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^3}\,dx &= \frac{b^2}{12d^3(1-c^2x^2)} - \frac{bcx(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{4bcx(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}} \\ &\quad + \frac{(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)} \\ &\quad - \frac{2(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} - \frac{2b^2\log(1-c^2x^2)}{3d^3} \\ &\quad + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^3} \\ &\quad - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^3} \\ &\quad - \frac{b^2\operatorname{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d^3} + \frac{b^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d^3}\end{aligned}$$

```
[Out] 1/12*b^2/d^3/(-c^2*x^2+1)-1/6*b*c*x*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^(3/2
)+1/4*(a+b*arcsin(c*x))^2/d^3/(-c^2*x^2+1)^2+1/2*(a+b*arcsin(c*x))^2/d^3/(-
c^2*x^2+1)-2*(a+b*arcsin(c*x))^2*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3-
2/3*b^2*ln(-c^2*x^2+1)/d^3+I*b*(a+b*arcsin(c*x))*polylog(2,-(I*c*x+(-c^2*x^
2+1)^(1/2))^2)/d^3-I*b*(a+b*arcsin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2
))^2)/d^3-1/2*b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3+1/2*b^2*poly
log(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3-4/3*b*c*x*(a+b*arcsin(c*x))/d^3/(-c
^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 296, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.407, Rules used = {4793, 4769, 4504, 4268, 2611, 2320, 6724, 4745, 266, 4747, 267}

$$\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^3}\,dx = -\frac{2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{d^3} - \frac{4bcx(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}} - \frac{bcx(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} + \frac{(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)} + \frac{(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{ib\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^3} - \frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^3} - \frac{b^2\,\text{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d^3} + \frac{b^2\,\text{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d^3} + \frac{b^2}{12d^3(1-c^2x^2)} - \frac{2b^2\log(1-c^2x^2)}{3d^3}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^3),x]
```

```
[Out] b^2/(12*d^3*(1 - c^2*x^2)) - (b*c*x*(a + b*ArcSin[c*x]))/(6*d^3*(1 - c^2*x^
2)^(3/2)) - (4*b*c*x*(a + b*ArcSin[c*x]))/(3*d^3*Sqrt[1 - c^2*x^2]) + (a +
b*ArcSin[c*x])^2/(4*d^3*(1 - c^2*x^2)^2) + (a + b*ArcSin[c*x])^2/(2*d^3*(1
- c^2*x^2)) - (2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^3
- (2*b^2*Log[1 - c^2*x^2])/(3*d^3) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -E
^((2*I)*ArcSin[c*x])])/d^3 - (I*b*(a + b*ArcSin[c*x])*PolyLog[2, E^((2*I)*A
rcSin[c*x])])/d^3 - (b^2*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/(2*d^3) + (b^2
*PolyLog[3, E^((2*I)*ArcSin[c*x])])/(2*d^3)
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} - \frac{(bc)\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^{5/2}}\,dx}{2d^3} + \frac{\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^2}\,dx}{d} \\
&= -\frac{bcx(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} + \frac{(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)} \\
&\quad - \frac{(bc)\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^{3/2}}\,dx}{3d^3} - \frac{(bc)\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^{3/2}}\,dx}{d^3} \\
&\quad + \frac{(b^2c^2)\int \frac{x}{(1-c^2x^2)^2}\,dx}{6d^3} + \frac{\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)}\,dx}{d^2} \\
&= \frac{b^2}{12d^3(1-c^2x^2)} - \frac{bcx(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{4bcx(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}} \\
&\quad + \frac{(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)} \\
&\quad + \frac{\text{Subst}\left(\int (a+bx)^2\csc(x)\sec(x)\,dx, x, \arcsin(cx)\right)}{d^3} \\
&\quad + \frac{(b^2c^2)\int \frac{x}{1-c^2x^2}\,dx}{3d^3} + \frac{(b^2c^2)\int \frac{x}{1-c^2x^2}\,dx}{d^3}
\end{aligned}
$$

$$= \frac{b^2}{12d^3(1-c^2x^2)} - \frac{bcx(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{4bcx(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)} - \frac{2b^2\log(1-c^2x^2)}{3d^3} + \frac{2\text{Subst}\left(\int (a+bx)^2\csc(2x)\,dx, x, \arcsin(cx)\right)}{d^3}$$

$$= \frac{b^2}{12d^3(1-c^2x^2)} - \frac{bcx(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{4bcx(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)} - \frac{2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} - \frac{2b^2\log(1-c^2x^2)}{3d^3} - \frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^3} + \frac{(2b)\text{Subst}\left(\int (a+bx)\log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^3}$$

$$= \frac{b^2}{12d^3(1-c^2x^2)} - \frac{bcx(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{4bcx(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)} - \frac{2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} - \frac{2b^2\log(1-c^2x^2)}{3d^3} + \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^3} - \frac{ib(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^3} - \frac{(ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^3} + \frac{(ib^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2,e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^3}$$

$$= \frac{b^2}{12d^3(1-c^2x^2)} - \frac{bcx(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{4bcx(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)} - \frac{2(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} - \frac{2b^2\log(1-c^2x^2)}{3d^3} + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^3} - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^3} - \frac{b^2\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,-x)}{x}dx,x,e^{2i\arcsin(cx)}\right)}{2d^3} + \frac{b^2\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,x)}{x}dx,x,e^{2i\arcsin(cx)}\right)}{2d^3}$$

$$= \frac{b^2}{12d^3(1-c^2x^2)} - \frac{bcx(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{4bcx(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)} - \frac{2(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} - \frac{2b^2\log(1-c^2x^2)}{3d^3} + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^3} - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^3} - \frac{b^2\operatorname{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d^3} + \frac{b^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d^3}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 756 vs. 2(296) = 592.

Time = 4.56 (sec) , antiderivative size = 756, normalized size of antiderivative = 2.55

$$\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^3}\,dx$$

$$= \frac{\frac{6a^2}{(-1+c^2x^2)^2} - \frac{12a^2}{-1+c^2x^2} + \frac{15ab\left(\sqrt{1-c^2x^2}-\arcsin(cx)\right)}{-1+cx} + \frac{15ab\left(\sqrt{1-c^2x^2}+\arcsin(cx)\right)}{1+cx} + \frac{ab\left((-2+cx)\sqrt{1-c^2x^2}+3\arcsin(cx)\right)}{(-1+cx)^2} + \frac{ab\left(\right.}{}}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^3),x]
```

```
[Out] ((6*a^2)/(-1 + c^2*x^2)^2 - (12*a^2)/(-1 + c^2*x^2) + (15*a*b*(Sqrt[1 - c^2
*x^2] - ArcSin[c*x]))/(-1 + c*x) + (15*a*b*(Sqrt[1 - c^2*x^2] + ArcSin[c*x]
))/(1 + c*x) + (a*b*((-2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x]))/(-1 + c
*x)^2 + (a*b*((2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x]))/(1 + c*x)^2 + 4
8*a*b*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 24*a^2*Log[c*x] - 12*a^2
*Log[1 - c^2*x^2] + 12*a*b*(I*ArcSin[c*x]^2 + ArcSin[c*x]*((-3*I)*Pi - 4*Lo
g[1 + I*E^(I*ArcSin[c*x])]) + 2*Pi*(-2*Log[1 + E^((-I)*ArcSin[c*x])] + Log[
1 + I*E^(I*ArcSin[c*x])] + 2*Log[Cos[ArcSin[c*x]/2]] - Log[-Cos[(Pi + 2*Arc
Sin[c*x])/4]]) + (4*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]) + 12*a*b*(I*ArcS
in[c*x]^2 + ArcSin[c*x]*((-I)*Pi - 4*Log[1 - I*E^(I*ArcSin[c*x])]) + 2*Pi*(
-2*Log[1 + E^((-I)*ArcSin[c*x])] - Log[1 - I*E^(I*ArcSin[c*x])] + 2*Log[Cos
[ArcSin[c*x]/2]] + Log[Sin[(Pi + 2*ArcSin[c*x])/4]]) + (4*I)*PolyLog[2, I*E
^(I*ArcSin[c*x])]) - (24*I)*a*b*(ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin
[c*x])]) - b^2*(I*Pi^3 + 2/(-1 + c^2*x^2) + (4*c*x*ArcSin[c*x])/(1 - c^2*x^
2)^(3/2) + (32*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (6*ArcSin[c*x]^2)/(-1 +
 c^2*x^2)^2 + (12*ArcSin[c*x]^2)/(-1 + c^2*x^2) - (16*I)*ArcSin[c*x]^3 - 24
*ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] + 24*ArcSin[c*x]^2*Log[1 + E
^((2*I)*ArcSin[c*x])] + 16*Log[1 - c^2*x^2] - (24*I)*ArcSin[c*x]*PolyLog[2,
 E^((-2*I)*ArcSin[c*x])] - (24*I)*ArcSin[c*x]*PolyLog[2, -E^((2*I)*ArcSin[c
*x])] - 12*PolyLog[3, E^((-2*I)*ArcSin[c*x])] + 12*PolyLog[3, -E^((2*I)*Arc
Sin[c*x])]))/(24*d^3)
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 758 vs. $2(324) = 648$.

Time = 0.44 (sec) , antiderivative size = 759, normalized size of antiderivative = 2.56

method	result
parts	$-\frac{a^2\left(-\ln(x)-\frac{1}{16(cx-1)^2}+\frac{5}{16(cx-1)}+\frac{\ln(cx-1)}{2}-\frac{1}{16(cx+1)^2}-\frac{5}{16(cx+1)}+\frac{\ln(cx+1)}{2}\right)}{d^3}-\frac{b^2\left(\frac{16i\arcsin(cx)x^4c^4-16\sqrt{-c^2x^2+}}{}\right.}{}$
derivativedivides	$-\frac{a^2\left(-\ln(cx)-\frac{1}{16(cx-1)^2}+\frac{5}{16(cx-1)}+\frac{\ln(cx-1)}{2}-\frac{1}{16(cx+1)^2}-\frac{5}{16(cx+1)}+\frac{\ln(cx+1)}{2}\right)}{d^3}-\frac{b^2\left(\frac{16i\arcsin(cx)x^4c^4-16\sqrt{-c^2x^2+}}{}\right.}{}$
default	$-\frac{a^2\left(-\ln(cx)-\frac{1}{16(cx-1)^2}+\frac{5}{16(cx-1)}+\frac{\ln(cx-1)}{2}-\frac{1}{16(cx+1)^2}-\frac{5}{16(cx+1)}+\frac{\ln(cx+1)}{2}\right)}{d^3}-\frac{b^2\left(\frac{16i\arcsin(cx)x^4c^4-16\sqrt{-c^2x^2+}}{}\right.}{}$

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -a^2/d^3*(-ln(x)-1/16/(c*x-1)^2+5/16/(c*x-1)+1/2*ln(c*x-1)-1/16/(c*x+1)^2-5
/16/(c*x+1)+1/2*ln(c*x+1))-b^2/d^3*(1/12*(16*I*arcsin(c*x)*c^4*x^4-16*(-c^2
*x^2+1)^(1/2)*arcsin(c*x)*c^3*x^3+6*arcsin(c*x)^2*x^2*c^2-32*I*arcsin(c*x)*
c^2*x^2+18*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-9*arcsin(c*x)^2+16*I*arcsin(c
```

```
*x)+c^2*x^2-1)/(c^4*x^4-2*c^2*x^2+1)+4/3*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)
-8/3*ln(I*c*x+(-c^2*x^2+1)^(1/2))-arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/
2))+2*I*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*polylog(3,-I*c*x
-(-c^2*x^2+1)^(1/2))+arcsin(c*x)^2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-I*arc
sin(c*x)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*polylog(3,-(I*c*x+(-c
^2*x^2+1)^(1/2))^2)-arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*arcsin
(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-2*polylog(3,I*c*x+(-c^2*x^2+1)^(1
/2)))-2*a*b/d^3*(1/12*(8*I*c^4*x^4-8*c^3*x^3*(-c^2*x^2+1)^(1/2)+6*c^2*x^2*a
rcsin(c*x)-16*I*c^2*x^2+9*c*x*(-c^2*x^2+1)^(1/2)-9*arcsin(c*x)+8*I)/(c^4*x^
4-2*c^2*x^2+1)-arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+I*polylog(2,-I*c*
x-(-c^2*x^2+1)^(1/2))+arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*I*
polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1
)^(1/2))+I*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\left(d-c^2dx^2\right)^3}\,dx=\int -\frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(c^2dx^2-d\right)^3x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^7 - 3*c^
4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\left(d-c^2dx^2\right)^3}\,dx = -\frac{\int \frac{a^2}{c^6x^7-3c^4x^5+3c^2x^3-x}\,dx+\int \frac{b^2\operatorname{asin}^2\left(cx\right)}{c^6x^7-3c^4x^5+3c^2x^3-x}\,dx+\int \frac{2ab\operatorname{asin}\left(cx\right)}{c^6x^7-3c^4x^5+3c^2x^3-x}\,dx}{d^3}$$

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2/(c**6*x**7 - 3*c**4*x**5 + 3*c**2*x**3 - x), x) + Integral(
b**2*asin(c*x)**2/(c**6*x**7 - 3*c**4*x**5 + 3*c**2*x**3 - x), x) + Integra
l(2*a*b*asin(c*x)/(c**6*x**7 - 3*c**4*x**5 + 3*c**2*x**3 - x), x))/d**3
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)^3x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*((2*c^2*x^2 - 3)/(c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3) + 2*log(c*x +
 1)/d^3 + 2*log(c*x - 1)/d^3 - 4*log(x)/d^3) - integrate((b^2*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)))/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)^3x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^3*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(d-c^2dx^2)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x\,(d-c^2\,d\,x^2)^3}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^3),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^3), x)
```

3.207 $\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 429

$$\begin{aligned}
\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^3}\,dx &= \frac{b^2c^2x}{12d^3(1-c^2x^2)} - \frac{bc(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} \\
&\quad - \frac{7bc(a+b\arcsin(cx))}{4d^3\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{d^3x(1-c^2x^2)^2} \\
&\quad + \frac{5c^2x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{15c^2x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} \\
&\quad - \frac{15ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} \\
&\quad - \frac{4bc(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^3} \\
&\quad + \frac{11b^2c\operatorname{arctanh}(cx)}{6d^3} + \frac{2ib^2c\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^3} \\
&\quad + \frac{15ibc(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4d^3} \\
&\quad - \frac{15ibc(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4d^3} \\
&\quad - \frac{2ib^2c\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^3} - \frac{15b^2c\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4d^3} \\
&\quad + \frac{15b^2c\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4d^3}
\end{aligned}$$

```
[Out] 1/12*b^2*c^2*x/d^3/(-c^2*x^2+1)-1/6*b*c*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^
(3/2)-(a+b*arcsin(c*x))^2/d^3/x/(-c^2*x^2+1)^2+5/4*c^2*x*(a+b*arcsin(c*x))^
2/d^3/(-c^2*x^2+1)^2+15/8*c^2*x*(a+b*arcsin(c*x))^2/d^3/(-c^2*x^2+1)-15/4*I
*c*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d^3-4*b*c*(a+b*arcs
```

```
in(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))/d^3+11/6*b^2*c*arctanh(c*x)/d^3+
2*I*b^2*c*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))/d^3+15/4*I*b*c*(a+b*arcsin(c
*x))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^3-15/4*I*b*c*(a+b*arcsin(c*
x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^3-2*I*b^2*c*polylog(2,I*c*x+(
-c^2*x^2+1)^(1/2))/d^3-15/4*b^2*c*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/
d^3+15/4*b^2*c*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^3-7/4*b*c*(a+b*arc
sin(c*x))/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.51 (sec) , antiderivative size = 429, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.556$, Rules used = {4789, 4747, 4749, 4266, 2611, 2320, 6724, 4767, 212, 205, 4793, 4803, 4268, 2317, 2438}

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^3}\,dx = -\frac{15ic\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{4d^3} - \frac{4bc\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^3} - \frac{7bc(a+b\arcsin(cx))}{4d^3\sqrt{1-c^2x^2}} - \frac{bc(a+b\arcsin(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} + \frac{15c^2x(a+b\arcsin(cx))^2}{8d^3\left(1-c^2x^2\right)} + \frac{5c^2x(a+b\arcsin(cx))^2}{4d^3\left(1-c^2x^2\right)^2} - \frac{(a+b\arcsin(cx))^2}{d^3x\left(1-c^2x^2\right)^2} + \frac{15ibc\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4d^3} - \frac{15ibc\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4d^3} + \frac{2ib^2c\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^3} - \frac{2ib^2c\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^3} - \frac{15b^2c\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4d^3} + \frac{15b^2c\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4d^3} + \frac{11b^2c\,\text{arctanh}(cx)}{6d^3} + \frac{b^2c^2x}{12d^3\left(1-c^2x^2\right)}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^3),x]
```

```
[Out] (b^2*c^2*x)/(12*d^3*(1 - c^2*x^2)) - (b*c*(a + b*ArcSin[c*x]))/(6*d^3*(1 -
c^2*x^2)^(3/2)) - (7*b*c*(a + b*ArcSin[c*x]))/(4*d^3*Sqrt[1 - c^2*x^2]) - (
a + b*ArcSin[c*x])^2/(d^3*x*(1 - c^2*x^2)^2) + (5*c^2*x*(a + b*ArcSin[c*x])
```

```
^2)/(4*d^3*(1 - c^2*x^2)^2) + (15*c^2*x*(a + b*ArcSin[c*x])^2)/(8*d^3*(1 -
c^2*x^2)) - (((15*I)/4)*c*(a + b*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/
d^3 - (4*b*c*(a + b*ArcSin[c*x])*ArcTanh[E^(I*ArcSin[c*x])])/d^3 + (11*b^2*
c*ArcTanh[c*x])/(6*d^3) + ((2*I)*b^2*c*PolyLog[2, -E^(I*ArcSin[c*x])])/d^3
+ (((15*I)/4)*b*c*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d
^3 - (((15*I)/4)*b*c*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d
^3 - ((2*I)*b^2*c*PolyLog[2, E^(I*ArcSin[c*x])])/d^3 - (15*b^2*c*PolyLog[3,
 (-I)*E^(I*ArcSin[c*x])])/(4*d^3) + (15*b^2*c*PolyLog[3, I*E^(I*ArcSin[c*x]
)])/(4*d^3)
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
```

```
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{(a+b\arcsin(cx))^2}{d^3x\left(1-c^2x^2\right)^2}+\left(5c^2\right)\int\frac{(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^3}\,dx+\frac{(2bc)\int\frac{a+b\arcsin(cx)}{x\left(1-c^2x^2\right)^{5/2}}\,dx}{d^3}\\
&= \frac{2bc(a+b\arcsin(cx))}{3d^3\left(1-c^2x^2\right)^{3/2}}-\frac{(a+b\arcsin(cx))^2}{d^3x\left(1-c^2x^2\right)^2}+\frac{5c^2x(a+b\arcsin(cx))^2}{4d^3\left(1-c^2x^2\right)^2}\\
&\quad+\frac{(2bc)\int\frac{a+b\arcsin(cx)}{x\left(1-c^2x^2\right)^{3/2}}\,dx}{d^3}-\frac{\left(2b^2c^2\right)\int\frac{1}{\left(1-c^2x^2\right)^2}\,dx}{3d^3}\\
&\quad-\frac{\left(5bc^3\right)\int\frac{x(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{5/2}}\,dx}{2d^3}+\frac{\left(15c^2\right)\int\frac{(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^2}\,dx}{4d}
\end{aligned}
$$

$$= -\frac{b^2c^2x}{3d^3(1-c^2x^2)} - \frac{bc(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} + \frac{2bc(a+b\arcsin(cx))}{d^3\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{d^3x(1-c^2x^2)^2} + \frac{5c^2x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{15c^2x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} + \frac{(2bc)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{d^3} - \frac{(b^2c^2)\int\frac{1}{1-c^2x^2}\,dx}{3d^3} + \frac{(5b^2c^2)\int\frac{1}{(1-c^2x^2)^2}\,dx}{6d^3} - \frac{(2b^2c^2)\int\frac{1}{1-c^2x^2}\,dx}{d^3} - \frac{(15bc^3)\int\frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{4d^3} + \frac{(15c^2)\int\frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{8d^2}$$

$$= \frac{b^2c^2x}{12d^3(1-c^2x^2)} - \frac{bc(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{7bc(a+b\arcsin(cx))}{4d^3\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{d^3x(1-c^2x^2)^2} + \frac{5c^2x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{15c^2x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} - \frac{7b^2c\,\text{arctanh}(cx)}{3d^3} + \frac{(15c)\text{Subst}\left(\int(a+bx)^2\sec(x)\,dx,x,\arcsin(cx)\right)}{8d^3} + \frac{(2bc)\text{Subst}\left(\int(a+bx)\csc(x)\,dx,x,\arcsin(cx)\right)}{d^3} + \frac{(5b^2c^2)\int\frac{1}{1-c^2x^2}\,dx}{12d^3} + \frac{(15b^2c^2)\int\frac{1}{1-c^2x^2}\,dx}{4d^3}$$

$$= \frac{b^2c^2x}{12d^3(1-c^2x^2)} - \frac{bc(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{7bc(a+b\arcsin(cx))}{4d^3\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{d^3x(1-c^2x^2)^2} + \frac{5c^2x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{15c^2x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} - \frac{15ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} - \frac{4bc(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^3} + \frac{11b^2c\,\text{arctanh}(cx)}{6d^3} - \frac{(15bc)\text{Subst}\left(\int(a+bx)\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{4d^3} + \frac{(15bc)\text{Subst}\left(\int(a+bx)\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{4d^3} - \frac{(2b^2c)\,\text{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^3} + \frac{(2b^2c)\,\text{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^3}$$

$$= \frac{b^2c^2x}{12d^3(1-c^2x^2)} - \frac{bc(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{7bc(a+b\arcsin(cx))}{4d^3\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{d^3x(1-c^2x^2)^2} + \frac{5c^2x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{15c^2x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} - \frac{15ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} - \frac{4bc(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^3} + \frac{11b^2c\text{arctanh}(cx)}{6d^3} + \frac{15ibc(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4d^3} - \frac{15ibc(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4d^3} + \frac{(2ib^2c)\,\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^3} - \frac{(2ib^2c)\,\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^3} - \frac{(15ib^2c)\,\text{Subst}\left(\int\text{PolyLog}\left(2,-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{4d^3} + \frac{(15ib^2c)\,\text{Subst}\left(\int\text{PolyLog}\left(2,ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{4d^3}$$

$$= \frac{b^2c^2x}{12d^3(1-c^2x^2)} - \frac{bc(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{7bc(a+b\arcsin(cx))}{4d^3\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{d^3x(1-c^2x^2)^2} + \frac{5c^2x(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{15c^2x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} - \frac{15ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} - \frac{4bc(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^3} + \frac{11b^2c\text{arctanh}(cx)}{6d^3} + \frac{2ib^2c\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^3} + \frac{15ibc(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4d^3} - \frac{15ibc(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4d^3} - \frac{2ib^2c\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^3} - \frac{(15b^2c)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{4d^3} + \frac{(15b^2c)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{4d^3}$$

$$
\begin{aligned}
&= \frac{b^2c^2x}{12d^3\left(1-c^2x^2\right)} - \frac{bc(a+b\arcsin(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}} - \frac{7bc(a+b\arcsin(cx))}{4d^3\sqrt{1-c^2x^2}} \\
&\quad - \frac{(a+b\arcsin(cx))^2}{d^3x\left(1-c^2x^2\right)^2} + \frac{5c^2x(a+b\arcsin(cx))^2}{4d^3\left(1-c^2x^2\right)^2} \\
&\quad + \frac{15c^2x(a+b\arcsin(cx))^2}{8d^3\left(1-c^2x^2\right)} - \frac{15ic(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} \\
&\quad - \frac{4bc(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^3} \\
&\quad + \frac{11b^2c\operatorname{arctanh}(cx)}{6d^3} + \frac{2ib^2c\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^3} \\
&\quad + \frac{15ibc(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4d^3} \\
&\quad - \frac{15ibc(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4d^3} - \frac{2ib^2c\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^3} \\
&\quad - \frac{15b^2c\operatorname{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4d^3} + \frac{15b^2c\operatorname{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4d^3}
\end{aligned}
$$

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1400 vs. 2(429) = 858.

Time = 11.77 (sec) , antiderivative size = 1400, normalized size of antiderivative = 3.26

$$
\begin{aligned}
&\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^3}\,dx \\
&= -\frac{a^2}{d^3x} + \frac{a^2c^2x}{4d^3\left(-1+c^2x^2\right)^2} - \frac{7a^2c^2x}{8d^3\left(-1+c^2x^2\right)} - \frac{15a^2c\log(1-cx)}{16d^3} + \frac{15a^2c\log(1+cx)}{16d^3} \\
&\quad - \frac{2abc\left(-\frac{7\left(\sqrt{1-c^2x^2}-\arcsin(cx)\right)}{16(-1+cx)} + \frac{\arcsin(cx)}{cx} + \frac{7\left(\sqrt{1-c^2x^2}+\arcsin(cx)\right)}{16(1+cx)} - \frac{(-2+cx)\sqrt{1-c^2x^2}+3\arcsin(cx)}{48(-1+cx)^2} + \frac{(2+cx)\sqrt{1-c^2x^2}+3}{48(1+cx)}\right.}{} \\
&\quad - \frac{b^2c\left(-2i\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right) + \frac{1}{24}\left(44\arcsin(cx) + 15\arcsin(cx)^3 - 45\arcsin(cx)^2\log\left(1-ie^{i\arcsin(c}\right.\right.\right.}{}
\end{aligned}
$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^3),x]
```

```
[Out] -(a^2/(d^3*x)) + (a^2*c^2*x)/(4*d^3*(-1 + c^2*x^2)^2) - (7*a^2*c^2*x)/(8*d^
3*(-1 + c^2*x^2)) - (15*a^2*c*Log[1 - c*x])/(16*d^3) + (15*a^2*c*Log[1 + c*
x])/(16*d^3) - (2*a*b*c*((-7*(Sqrt[1 - c^2*x^2] - ArcSin[c*x]))/(16*(-1 + c
*x)) + ArcSin[c*x]/(c*x) + (7*(Sqrt[1 - c^2*x^2] + ArcSin[c*x]))/(16*(1 + c
*x)) - ((-2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x])/(48*(-1 + c*x)^2) + (
(2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x])/(48*(1 + c*x)^2) + ArcTanh[Sqr
t[1 - c^2*x^2]] + (15*(((3*I)/2)*Pi*ArcSin[c*x] - (I/2)*ArcSin[c*x]^2 + 2*P
```

```
i*Log[1 + E^((-I)*ArcSin[c*x])] - Pi*Log[1 + I*E^(I*ArcSin[c*x])] + 2*ArcSi
n[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - 2*Pi*Log[Cos[ArcSin[c*x]/2]] + Pi*Log
[-Cos[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]))
/16 - (15*((I/2)*Pi*ArcSin[c*x] - (I/2)*ArcSin[c*x]^2 + 2*Pi*Log[1 + E^((-I
)*ArcSin[c*x])] + Pi*Log[1 - I*E^(I*ArcSin[c*x])] + 2*ArcSin[c*x]*Log[1 - I
*E^(I*ArcSin[c*x])] - 2*Pi*Log[Cos[ArcSin[c*x]/2]] - Pi*Log[Sin[(Pi + 2*Arc
Sin[c*x])/4]] - (2*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]))/16))/d^3 - (b^2*c*(
(-2*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (44*ArcSin[c*x] + 15*ArcSin[c*x]^3
- 45*ArcSin[c*x]^2*Log[1 - I*E^(I*ArcSin[c*x])] - 45*Pi*ArcSin[c*x]*Log[((-
1)^(1/4)*(1 - I*E^(I*ArcSin[c*x])))/(2*E^((I/2)*ArcSin[c*x]))] + 45*ArcSin[
c*x]^2*Log[1 + I*E^(I*ArcSin[c*x])] + 45*ArcSin[c*x]^2*Log[((1/2 + I/2)*(-I
 + E^(I*ArcSin[c*x])))/E^((I/2)*ArcSin[c*x])] - 45*Pi*ArcSin[c*x]*Log[-1/2*
((-1)^(1/4)*(-I + E^(I*ArcSin[c*x])))/E^((I/2)*ArcSin[c*x])] - 45*ArcSin[c*
x]^2*Log[((1 + I) + (1 - I)*E^(I*ArcSin[c*x]))/(2*E^((I/2)*ArcSin[c*x]))] +
 45*Pi*ArcSin[c*x]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 44*Log[Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2]] - 45*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] - Sin
[ArcSin[c*x]/2]] - 44*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + 45*Arc
Sin[c*x]^2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + 45*Pi*ArcSin[c*x]
*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (90*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])] + (90*I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] + 90*Po
lyLog[3, (-I)*E^(I*ArcSin[c*x])] - 90*PolyLog[3, I*E^(I*ArcSin[c*x])])/24 -
 (4 + 88*c*x*ArcSin[c*x] - 54*ArcSin[c*x]^2 + 30*c*x*ArcSin[c*x]^3 - 240*Ar
cSin[c*x]^2*Cos[2*ArcSin[c*x]] - 4*Cos[4*ArcSin[c*x]] - 90*ArcSin[c*x]^2*Co
s[4*ArcSin[c*x]] + 96*c*x*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - 96*c*x*A
rcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (768*I)*c*x*(1 - c^2*x^2)^2*PolyLog
[2, E^(I*ArcSin[c*x])] - 200*ArcSin[c*x]*Sin[2*ArcSin[c*x]] + 132*ArcSin[c*
x]*Sin[3*ArcSin[c*x]] + 45*ArcSin[c*x]^3*Sin[3*ArcSin[c*x]] + 144*ArcSin[c*
x]*Log[1 - E^(I*ArcSin[c*x])]*Sin[3*ArcSin[c*x]] - 144*ArcSin[c*x]*Log[1 +
E^(I*ArcSin[c*x])]*Sin[3*ArcSin[c*x]] - 84*ArcSin[c*x]*Sin[4*ArcSin[c*x]] +
 44*ArcSin[c*x]*Sin[5*ArcSin[c*x]] + 15*ArcSin[c*x]^3*Sin[5*ArcSin[c*x]] +
48*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])]*Sin[5*ArcSin[c*x]] - 48*ArcSin[c*
x]*Log[1 + E^(I*ArcSin[c*x])]*Sin[5*ArcSin[c*x]])/(384*c*x*(1 - c^2*x^2)^2)
))/d^3
```

Maple [A] (verified)

Time = 0.57 (sec) , antiderivative size = 730, normalized size of antiderivative = 1.70

method	result
derivativedivides	$c\left(-\frac{a^2\left(\frac{1}{cx}-\frac{1}{16(cx-1)^2}+\frac{7}{16(cx-1)}+\frac{15\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}+\frac{7}{16(cx+1)}-\frac{15\ln(cx+1)}{16}\right)}{d^3}-\frac{b^2\left(\frac{45\arcsin(cx)^2x^4c^4-42\sqrt{-c^2}\cdots}{}\right.}{}\right.$
default	$c\left(-\frac{a^2\left(\frac{1}{cx}-\frac{1}{16(cx-1)^2}+\frac{7}{16(cx-1)}+\frac{15\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}+\frac{7}{16(cx+1)}-\frac{15\ln(cx+1)}{16}\right)}{d^3}-\frac{b^2\left(\frac{45\arcsin(cx)^2x^4c^4-42\sqrt{-c^2}\cdots}{}\right.}{}\right.$
parts	$-\frac{a^2\left(\frac{1}{x}-\frac{c}{16(cx-1)^2}+\frac{7c}{16(cx-1)}+\frac{15c\ln(cx-1)}{16}+\frac{c}{16(cx+1)^2}+\frac{7c}{16(cx+1)}-\frac{15c\ln(cx+1)}{16}\right)}{d^3}-\frac{b^2c\left(\frac{45\arcsin(cx)^2x^4c^4-42\sqrt{-c^2x^2}\cdots}{}\right.}{}$

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] c*(-a^2/d^3*(1/c/x-1/16/(c*x-1)^2+7/16/(c*x-1)+15/16*ln(c*x-1)+1/16/(c*x+1)
^2+7/16/(c*x+1)-15/16*ln(c*x+1))-b^2/d^3*(1/24*(45*arcsin(c*x)^2*x^4*c^4-42
*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3*x^3-75*arcsin(c*x)^2*x^2*c^2+2*c^4*x^4+
46*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c+24*arcsin(c*x)^2-2*c^2*x^2)/c/x/(c^4*
x^4-2*c^2*x^2+1)+15/8*arcsin(c*x)^2*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-15/4
*I*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+15/4*polylog(3,-I*(
I*c*x+(-c^2*x^2+1)^(1/2)))-15/8*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1
/2)))+15/4*I*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-15/4*polyl
og(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-2*I*
dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+11/3*I*arctan(I*c*x+(-c^2*x^2+1)^(1/2))+2
*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2)))-2*a*b/d^3*(1/24*(45*c^4*x^4*ar
csin(c*x)-21*c^3*x^3*(-c^2*x^2+1)^(1/2)-75*c^2*x^2*arcsin(c*x)+23*c*x*(-c^2
*x^2+1)^(1/2)+24*arcsin(c*x))/c/x/(c^4*x^4-2*c^2*x^2+1)+15/8*arcsin(c*x)*ln
(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-15/8*arcsin
(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-15/
8*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+15/8*I*dilog(1-I*(I*c*x+(-c^2*x^2
+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^3}\,dx=\int -\frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(c^2dx^2-d\right)^3x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^8 - 3*c^
4*d^3*x^6 + 3*c^2*d^3*x^4 - d^3*x^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^3}\,dx = -\frac{\int \frac{a^2}{c^6x^8-3c^4x^6+3c^2x^4-x^2}\,dx + \int \frac{b^2\,\mathrm{asin}^2\,(cx)}{c^6x^8-3c^4x^6+3c^2x^4-x^2}\,dx + \int \frac{2ab\,\mathrm{asin}\,(cx)}{c^6x^8-3c^4x^6+3c^2x^4-x^2}\,dx}{d^3}$$

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2/(c**6*x**8 - 3*c**4*x**6 + 3*c**2*x**4 - x**2), x) + Integr
al(b**2*asin(c*x)**2/(c**6*x**8 - 3*c**4*x**6 + 3*c**2*x**4 - x**2), x) + I
ntegral(2*a*b*asin(c*x)/(c**6*x**8 - 3*c**4*x**6 + 3*c**2*x**4 - x**2), x))
/d**3
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)^3x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/16*a^2*(2*(15*c^4*x^4 - 25*c^2*x^2 + 8)/(c^4*d^3*x^5 - 2*c^2*d^3*x^3 + d
^3*x) - 15*c*log(c*x + 1)/d^3 + 15*c*log(c*x - 1)/d^3) + 1/16*(15*(b^2*c^5*
x^5 - 2*b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
*log(c*x + 1) - 15*(b^2*c^5*x^5 - 2*b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqr
t(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1) - 2*(15*b^2*c^4*x^4 - 25*b^2*c^2
*x^2 + 8*b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 16*(c^4*d^3*x^
5 - 2*c^2*d^3*x^3 + d^3*x)*integrate(-1/8*(16*a*b*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)) - (15*(b^2*c^6*x^6 - 2*b^2*c^4*x^4 + b^2*c^2*x^2)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(c*x + 1) - 15*(b^2*c^6*x^6 - 2*b^2*
c^4*x^4 + b^2*c^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x
+ 1) - 2*(15*b^2*c^5*x^5 - 25*b^2*c^3*x^3 + 8*b^2*c*x)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^8 - 3*c^4*
d^3*x^6 + 3*c^2*d^3*x^4 - d^3*x^2), x))/(c^4*d^3*x^5 - 2*c^2*d^3*x^3 + d^3*
x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)^3x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^3*x^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^2\,(d-c^2\,d\,x^2)^3}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^3),x)
[Out] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^3), x)
```

3.208 $\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 403

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^3}\,dx ={}& \frac{b^2c^2}{12d^3(1-c^2x^2)}-\frac{bc(a+b\arcsin(cx))}{d^3x(1-c^2x^2)^{3/2}}+\frac{5bc^3x(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}}\\ &-\frac{4bc^3x(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2}\\ &-\frac{(a+b\arcsin(cx))^2}{2d^3x^2(1-c^2x^2)^2}+\frac{3c^2(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)}\\ &-\frac{6c^2(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3}\\ &+\frac{b^2c^2\log(x)}{d^3}-\frac{7b^2c^2\log(1-c^2x^2)}{6d^3}\\ &+\frac{3ibc^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^3}\\ &-\frac{3ibc^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^3}\\ &-\frac{3b^2c^2\operatorname{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d^3}\\ &+\frac{3b^2c^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d^3}\end{aligned}$$

```
[Out] 1/12*b^2*c^2/d^3/(-c^2*x^2+1)-b*c*(a+b*arcsin(c*x))/d^3/x/(-c^2*x^2+1)^(3/2
)+5/6*b*c^3*x*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^(3/2)+3/4*c^2*(a+b*arcsin(
c*x))^2/d^3/(-c^2*x^2+1)^2-1/2*(a+b*arcsin(c*x))^2/d^3/x^2/(-c^2*x^2+1)^2+3
/2*c^2*(a+b*arcsin(c*x))^2/d^3/(-c^2*x^2+1)-6*c^2*(a+b*arcsin(c*x))^2*arcta
nh((I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3+b^2*c^2*ln(x)/d^3-7/6*b^2*c^2*ln(-c^2*
x^2+1)/d^3+3*I*b*c^2*(a+b*arcsin(c*x))*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2)
```

```
)^2)/d^3-3*I*b*c^2*(a+b*arcsin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2
)/d^3-3/2*b^2*c^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3+3/2*b^2*c^2*
polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3-4/3*b*c^3*x*(a+b*arcsin(c*x))/d
^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 403, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.704$, Rules used = {4789, 4793, 4769, 4504, 4268, 2611, 2320, 6724, 4745, 266, 4747, 267, 277, 198, 197, 4779, 12, 1265, 907}

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^3}\,dx = & -\frac{6c^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{d^3} \\ & +\frac{3ibc^2\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^3} \\ & -\frac{3ibc^2\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^3} \\ & +\frac{3c^2(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)}+\frac{3c^2(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} \\ & -\frac{bc(a+b\arcsin(cx))}{d^3x(1-c^2x^2)^{3/2}}-\frac{(a+b\arcsin(cx))^2}{2d^3x^2(1-c^2x^2)^2} \\ & -\frac{4bc^3x(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}}+\frac{5bc^3x(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} \\ & -\frac{3b^2c^2\operatorname{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d^3} \\ & +\frac{3b^2c^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d^3}+\frac{b^2c^2}{12d^3(1-c^2x^2)} \\ & -\frac{7b^2c^2\log(1-c^2x^2)}{6d^3}+\frac{b^2c^2\log(x)}{d^3}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^3),x]
```

```
[Out] (b^2*c^2)/(12*d^3*(1 - c^2*x^2)) - (b*c*(a + b*ArcSin[c*x]))/(d^3*x*(1 - c^
2*x^2)^(3/2)) + (5*b*c^3*x*(a + b*ArcSin[c*x]))/(6*d^3*(1 - c^2*x^2)^(3/2))
 - (4*b*c^3*x*(a + b*ArcSin[c*x]))/(3*d^3*Sqrt[1 - c^2*x^2]) + (3*c^2*(a +
b*ArcSin[c*x])^2)/(4*d^3*(1 - c^2*x^2)^2) - (a + b*ArcSin[c*x])^2/(2*d^3*x^
2*(1 - c^2*x^2)^2) + (3*c^2*(a + b*ArcSin[c*x])^2)/(2*d^3*(1 - c^2*x^2)) -
(6*c^2*(a + b*ArcSin[c*x])^2*ArcTanh[E^((2*I)*ArcSin[c*x])])/d^3 + (b^2*c^2
*Log[x])/d^3 - (7*b^2*c^2*Log[1 - c^2*x^2])/(6*d^3) + ((3*I)*b*c^2*(a + b*A
rcSin[c*x])*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/d^3 - ((3*I)*b*c^2*(a + b*A
rcSin[c*x])*PolyLog[2, E^((2*I)*ArcSin[c*x])])/d^3 - (3*b^2*c^2*PolyLog[3,
```

```
-E^((2*I)*ArcSin[c*x])])/(2*d^3) + (3*b^2*c^2*PolyLog[3, E^((2*I)*ArcSin[c*
x])])/(2*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 907

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4779

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(p_)
, x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[
c*x], u, x] - Dist[b*c*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[Simplif
yIntegrand[u/Sqrt[d + e*x^2], x], x], x]] /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IntegerQ[p - 1/2] && NeQ[p, -2^(-1)] && (IGtQ[(m + 1)/2
, 0] || ILtQ[(m + 2*p + 3)/2, 0])
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = -\frac{(a+b\arcsin(cx))^2}{2d^3x^2\left(1-c^2x^2\right)^2}+\left(3c^2\right)\int\frac{(a+b\arcsin(cx))^2}{x\left(d-c^2dx^2\right)^3}\,dx+\frac{(bc)\int\frac{a+b\arcsin(cx)}{x^2(1-c^2x^2)^{5/2}}\,dx}{d^3}$$

$$=-\frac{bc(a+b\arcsin(cx))}{d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{4bc^3x(a+b\arcsin(cx))}{3d^3\left(1-c^2x^2\right)^{3/2}}+\frac{8bc^3x(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2(a+b\arcsin(cx))^2}{4d^3\left(1-c^2x^2\right)^2}-\frac{(a+b\arcsin(cx))^2}{2d^3x^2\left(1-c^2x^2\right)^2}-\frac{\left(b^2c^2\right)\int\frac{-3+12c^2x^2-8c^4x^4}{3x(1-c^2x^2)^2}\,dx}{d^3}-\frac{\left(3bc^3\right)\int\frac{a+b\arcsin(cx)}{(1-c^2x^2)^{5/2}}\,dx}{2d^3}+\frac{\left(3c^2\right)\int\frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^2}\,dx}{d}$$

$$=-\frac{bc(a+b\arcsin(cx))}{d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x(a+b\arcsin(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}}+\frac{8bc^3x(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2(a+b\arcsin(cx))^2}{4d^3\left(1-c^2x^2\right)^2}-\frac{(a+b\arcsin(cx))^2}{2d^3x^2\left(1-c^2x^2\right)^2}+\frac{3c^2(a+b\arcsin(cx))^2}{2d^3\left(1-c^2x^2\right)}-\frac{\left(b^2c^2\right)\int\frac{-3+12c^2x^2-8c^4x^4}{x(1-c^2x^2)^2}\,dx}{3d^3}-\frac{\left(bc^3\right)\int\frac{a+b\arcsin(cx)}{(1-c^2x^2)^{3/2}}\,dx}{d^3}-\frac{\left(3bc^3\right)\int\frac{a+b\arcsin(cx)}{(1-c^2x^2)^{3/2}}\,dx}{d^3}+\frac{\left(b^2c^4\right)\int\frac{x}{(1-c^2x^2)^2}\,dx}{2d^3}+\frac{\left(3c^2\right)\int\frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)}\,dx}{d^2}$$

$$=\frac{b^2c^2}{4d^3\left(1-c^2x^2\right)}-\frac{bc(a+b\arcsin(cx))}{d^3x\left(1-c^2x^2\right)^{3/2}}+\frac{5bc^3x(a+b\arcsin(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}}-\frac{4bc^3x(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}}+\frac{3c^2(a+b\arcsin(cx))^2}{4d^3\left(1-c^2x^2\right)^2}-\frac{(a+b\arcsin(cx))^2}{2d^3x^2\left(1-c^2x^2\right)^2}+\frac{3c^2(a+b\arcsin(cx))^2}{2d^3\left(1-c^2x^2\right)}+\frac{\left(3c^2\right)\operatorname{Subst}\left(\int(a+bx)^2\csc(x)\sec(x)\,dx,x,\arcsin(cx)\right)}{d^3}-\frac{\left(b^2c^2\right)\operatorname{Subst}\left(\int\frac{-3+12c^2x-8c^4x^2}{x(1-c^2x)^2}\,dx,x,x^2\right)}{6d^3}+\frac{\left(b^2c^4\right)\int\frac{x}{1-c^2x^2}\,dx}{d^3}+\frac{\left(3b^2c^4\right)\int\frac{x}{1-c^2x^2}\,dx}{d^3}$$

$$
\begin{aligned}
&= \frac{b^2c^2}{4d^3(1-c^2x^2)} - \frac{bc(a+b\arcsin(cx))}{d^3x(1-c^2x^2)^{3/2}} + \frac{5bc^3x(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} \\
&\quad - \frac{4bc^3x(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{3c^2(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} \\
&\quad - \frac{(a+b\arcsin(cx))^2}{2d^3x^2(1-c^2x^2)^2} + \frac{3c^2(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)} - \frac{2b^2c^2\log(1-c^2x^2)}{d^3} \\
&\quad + \frac{(6c^2)\,\text{Subst}\left(\int (a+bx)^2\csc(2x)\,dx, x, \arcsin(cx)\right)}{d^3} \\
&\quad - \frac{(b^2c^2)\,\text{Subst}\left(\int \left(-\frac{3}{x} + \frac{c^2}{(-1+c^2x)^2} - \frac{5c^2}{-1+c^2x}\right)\,dx, x, x^2\right)}{6d^3} \\
&= \frac{b^2c^2}{12d^3(1-c^2x^2)} - \frac{bc(a+b\arcsin(cx))}{d^3x(1-c^2x^2)^{3/2}} + \frac{5bc^3x(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} \\
&\quad - \frac{4bc^3x(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{3c^2(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} - \frac{(a+b\arcsin(cx))^2}{2d^3x^2(1-c^2x^2)^2} \\
&\quad + \frac{3c^2(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)} - \frac{6c^2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} + \frac{b^2c^2\log(x)}{d^3} \\
&\quad - \frac{7b^2c^2\log(1-c^2x^2)}{6d^3} - \frac{(6bc^2)\,\text{Subst}\left(\int (a+bx)\log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^3} \\
&\quad + \frac{(6bc^2)\,\text{Subst}\left(\int (a+bx)\log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^3} \\
&= \frac{b^2c^2}{12d^3(1-c^2x^2)} - \frac{bc(a+b\arcsin(cx))}{d^3x(1-c^2x^2)^{3/2}} + \frac{5bc^3x(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} \\
&\quad - \frac{4bc^3x(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{3c^2(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} - \frac{(a+b\arcsin(cx))^2}{2d^3x^2(1-c^2x^2)^2} \\
&\quad + \frac{3c^2(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)} - \frac{6c^2(a+b\arcsin(cx))^2\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} + \frac{b^2c^2\log(x)}{d^3} \\
&\quad - \frac{7b^2c^2\log(1-c^2x^2)}{6d^3} + \frac{3ibc^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2, -e^{2i\arcsin(cx)}\right)}{d^3} \\
&\quad - \frac{3ibc^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)}{d^3} \\
&\quad - \frac{(3ib^2c^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2, -e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^3} \\
&\quad + \frac{(3ib^2c^2)\,\text{Subst}\left(\int \text{PolyLog}\left(2, e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^3}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{b^2c^2}{12d^3(1-c^2x^2)} - \frac{bc(a+b\arcsin(cx))}{d^3x(1-c^2x^2)^{3/2}} + \frac{5bc^3x(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} \\
&- \frac{4bc^3x(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{3c^2(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} - \frac{(a+b\arcsin(cx))^2}{2d^3x^2(1-c^2x^2)^2} \\
&+ \frac{3c^2(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)} - \frac{6c^2(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} + \frac{b^2c^2\log(x)}{d^3} \\
&- \frac{7b^2c^2\log(1-c^2x^2)}{6d^3} + \frac{3ibc^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^3} \\
&- \frac{3ibc^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^3} \\
&- \frac{(3b^2c^2)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2d^3} \\
&+ \frac{(3b^2c^2)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2d^3}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{b^2c^2}{12d^3(1-c^2x^2)} - \frac{bc(a+b\arcsin(cx))}{d^3x(1-c^2x^2)^{3/2}} + \frac{5bc^3x(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} \\
&- \frac{4bc^3x(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}} + \frac{3c^2(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} - \frac{(a+b\arcsin(cx))^2}{2d^3x^2(1-c^2x^2)^2} \\
&+ \frac{3c^2(a+b\arcsin(cx))^2}{2d^3(1-c^2x^2)} - \frac{6c^2(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^3} + \frac{b^2c^2\log(x)}{d^3} \\
&- \frac{7b^2c^2\log(1-c^2x^2)}{6d^3} + \frac{3ibc^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^3} \\
&- \frac{3ibc^2(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^3} \\
&- \frac{3b^2c^2\operatorname{PolyLog}\left(3,-e^{2i\arcsin(cx)}\right)}{2d^3} + \frac{3b^2c^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(cx)}\right)}{2d^3}
\end{aligned}
$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1003 vs. 2(403) = 806.

Time = 7.92 (sec) , antiderivative size = 1003, normalized size of antiderivative = 2.49

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^3}\,dx$$
$$= -\frac{a^2}{2d^3x^2} + \frac{a^2c^2}{4d^3(-1+c^2x^2)^2} - \frac{a^2c^2}{d^3(-1+c^2x^2)} + \frac{3a^2c^2\log(x)}{d^3} - \frac{3a^2c^2\log(1-c^2x^2)}{2d^3}$$
$$- \frac{2ab\left(\frac{c^2\left((2-cx)\sqrt{1-c^2x^2}-3\arcsin(cx)\right)}{48(-1+cx)^2} - \frac{9c^2\left(\sqrt{1-c^2x^2}-\arcsin(cx)\right)}{16(-1+cx)} - \frac{9c^3\left(\sqrt{1-c^2x^2}+\arcsin(cx)\right)}{16(c+c^2x)} + \frac{cx\sqrt{1-c^2x^2}+\arcsin(cx)}{2x^2} - \cdots\right.}{\cdots}$$
$$- \frac{b^2c^2\left(\frac{i\pi^3}{8} - \frac{1}{12(1-c^2x^2)} + \frac{cx\arcsin(cx)}{6(1-c^2x^2)^{3/2}} + \frac{7cx\arcsin(cx)}{3\sqrt{1-c^2x^2}} + \frac{\sqrt{1-c^2x^2}\arcsin(cx)}{cx} + \frac{\arcsin(cx)^2}{2c^2x^2} - \frac{\arcsin(cx)^2}{4(1-c^2x^2)^2} - \frac{\arcsin(cx)^2}{1-c^2x^2} - \cdots\right.}{\cdots}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/2*a^2/(d^3*x^2) + (a^2*c^2)/(4*d^3*(-1 + c^2*x^2)^2) - (a^2*c^2)/(d^3*(-
1 + c^2*x^2)) + (3*a^2*c^2*Log[x])/d^3 - (3*a^2*c^2*Log[1 - c^2*x^2])/(2*d^
3) - (2*a*b*((c^2*((2 - c*x)*Sqrt[1 - c^2*x^2] - 3*ArcSin[c*x]))/(48*(-1 +
c*x)^2) - (9*c^2*(Sqrt[1 - c^2*x^2] - ArcSin[c*x]))/(16*(-1 + c*x)) - (9*c^
3*(Sqrt[1 - c^2*x^2] + ArcSin[c*x]))/(16*(c + c^2*x)) + (c*x*Sqrt[1 - c^2*x
^2] + ArcSin[c*x])/(2*x^2) - (c^2*((2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c
*x]))/(48*(1 + c*x)^2) + (3*c^3*((((3*I)/2)*Pi*ArcSin[c*x])/c - ((I/2)*ArcS
in[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c - (Pi*Log[1 + I*E^(I*
ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])])/c - (2*Pi*L
og[Cos[ArcSin[c*x]/2]])/c + (Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]])/c - ((2*
I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/c))/2 + (3*c^3*(((I/2)*Pi*ArcSin[c*x
])/c - ((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c + (
Pi*Log[1 - I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c
*x])])/c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c - (Pi*Log[Sin[(Pi + 2*ArcSin[c*
x])/4]])/c - ((2*I)*PolyLog[2, I*E^(I*ArcSin[c*x])])/c))/2 - 3*c^2*(ArcSin[
c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - (I/2)*(ArcSin[c*x]^2 + PolyLog[2, E^(
(2*I)*ArcSin[c*x])]))))/d^3 - (b^2*c^2*((I/8)*Pi^3 - 1/(12*(1 - c^2*x^2)) +
 (c*x*ArcSin[c*x])/(6*(1 - c^2*x^2)^(3/2)) + (7*c*x*ArcSin[c*x])/(3*Sqrt[1
- c^2*x^2]) + (Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*x) + ArcSin[c*x]^2/(2*c^2*
x^2) - ArcSin[c*x]^2/(4*(1 - c^2*x^2)^2) - ArcSin[c*x]^2/(1 - c^2*x^2) - (2
*I)*ArcSin[c*x]^3 - 3*ArcSin[c*x]^2*Log[1 - E^((-2*I)*ArcSin[c*x])] + 3*Arc
Sin[c*x]^2*Log[1 + E^((2*I)*ArcSin[c*x])] - Log[(c*x)/Sqrt[1 - c^2*x^2]] +
(4*Log[Sqrt[1 - c^2*x^2]])/3 - (3*I)*ArcSin[c*x]*PolyLog[2, E^((-2*I)*ArcSi
n[c*x])] - (3*I)*ArcSin[c*x]*PolyLog[2, -E^((2*I)*ArcSin[c*x])] - (3*PolyLo
g[3, E^((-2*I)*ArcSin[c*x])])/2 + (3*PolyLog[3, -E^((2*I)*ArcSin[c*x])])/2)
)/d^3
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 920 vs. $2(427) = 854$.

Time = 0.51 (sec) , antiderivative size = 921, normalized size of antiderivative = 2.29

method	result
derivativedivides	$c^2\left(-\frac{a^2\left(\frac{1}{2c^2x^2}-3\ln(cx)-\frac{1}{16(cx-1)^2}+\frac{9}{16(cx-1)}+\frac{3\ln(cx-1)}{2}-\frac{1}{16(cx+1)^2}-\frac{9}{16(cx+1)}+\frac{3\ln(cx+1)}{2}\right)}{d^3}-\frac{b^2\left(\frac{16i\arcsin(cx)c^6}{}\right.}{}\right.$
default	$c^2\left(-\frac{a^2\left(\frac{1}{2c^2x^2}-3\ln(cx)-\frac{1}{16(cx-1)^2}+\frac{9}{16(cx-1)}+\frac{3\ln(cx-1)}{2}-\frac{1}{16(cx+1)^2}-\frac{9}{16(cx+1)}+\frac{3\ln(cx+1)}{2}\right)}{d^3}-\frac{b^2\left(\frac{16i\arcsin(cx)c^6}{}\right.}{}\right.$
parts	$-\frac{a^2\left(\frac{1}{2x^2}-3c^2\ln(x)-\frac{c^2}{16(cx-1)^2}+\frac{9c^2}{16(cx-1)}+\frac{3c^2\ln(cx-1)}{2}-\frac{c^2}{16(cx+1)^2}-\frac{9c^2}{16(cx+1)}+\frac{3c^2\ln(cx+1)}{2}\right)}{d^3}-\frac{b^2c^2\left(\frac{16i\arcsin(cx)c}{}\right.}{}$

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^2*(-a^2/d^3*(1/2/c^2/x^2-3*ln(c*x)-1/16/(c*x-1)^2+9/16/(c*x-1)+3/2*ln(c*x
-1)-1/16/(c*x+1)^2-9/16/(c*x+1)+3/2*ln(c*x+1))-b^2/d^3*(1/12/(c^4*x^4-2*c^2
*x^2+1)/c^2/x^2*(16*I*arcsin(c*x)*c^6*x^6-16*(-c^2*x^2+1)^(1/2)*arcsin(c*x)
*c^5*x^5+18*arcsin(c*x)^2*x^4*c^4-32*I*arcsin(c*x)*c^4*x^4+6*(-c^2*x^2+1)^(
1/2)*arcsin(c*x)*c^3*x^3-27*arcsin(c*x)^2*x^2*c^2+16*I*arcsin(c*x)*c^2*x^2+
c^4*x^4+12*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c+6*arcsin(c*x)^2-c^2*x^2)-ln(I
*c*x+(-c^2*x^2+1)^(1/2)-1)+7/3*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-8/3*ln(I*
c*x+(-c^2*x^2+1)^(1/2))-ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-3*arcsin(c*x)^2*ln(1
+I*c*x+(-c^2*x^2+1)^(1/2))+6*I*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1
/2))-6*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+3*arcsin(c*x)^2*ln(1+(I*c*x+(-c
^2*x^2+1)^(1/2))^2)-3*I*arcsin(c*x)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2
)+3/2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-3*arcsin(c*x)^2*ln(1-I*c*x-(
-c^2*x^2+1)^(1/2))+6*I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-6*po
lylog(3,I*c*x+(-c^2*x^2+1)^(1/2)))-2*a*b/d^3*(1/12/(c^4*x^4-2*c^2*x^2+1)/c^
2/x^2*(8*I*c^6*x^6-8*c^5*x^5*(-c^2*x^2+1)^(1/2)+18*c^4*x^4*arcsin(c*x)-16*I
*c^4*x^4+3*c^3*x^3*(-c^2*x^2+1)^(1/2)-27*c^2*x^2*arcsin(c*x)+8*I*c^2*x^2+6*
c*x*(-c^2*x^2+1)^(1/2)+6*arcsin(c*x))-3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)
^(1/2))+3*I*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+3*arcsin(c*x)*ln(1+(I*c*x+
(-c^2*x^2+1)^(1/2))^2)-3/2*I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-3*arc
sin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+3*I*polylog(2,I*c*x+(-c^2*x^2+1)^(1
/2))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)^3x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^9 - 3*c^
4*d^3*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^3}\,dx = -\frac{\int \frac{a^2}{c^6x^9-3c^4x^7+3c^2x^5-x^3}\,dx + \int \frac{b^2\operatorname{asin}^2(cx)}{c^6x^9-3c^4x^7+3c^2x^5-x^3}\,dx + \int \frac{2ab\operatorname{asin}(cx)}{c^6x^9-3c^4x^7+3c^2x^5-x^3}\,dx}{d^3}$$

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**3,x)
[Out] -(Integral(a**2/(c**6*x**9 - 3*c**4*x**7 + 3*c**2*x**5 - x**3), x) + Integr
al(b**2*asin(c*x)**2/(c**6*x**9 - 3*c**4*x**7 + 3*c**2*x**5 - x**3), x) + I
ntegral(2*a*b*asin(c*x)/(c**6*x**9 - 3*c**4*x**7 + 3*c**2*x**5 - x**3), x))
/d**3
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)^3x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
[Out] -1/4*a^2*((6*c^4*x^4 - 9*c^2*x^2 + 2)/(c^4*d^3*x^6 - 2*c^2*d^3*x^4 + d^3*x^
2) + 6*c^2*log(c*x + 1)/d^3 + 6*c^2*log(c*x - 1)/d^3 - 12*c^2*log(x)/d^3) -
 integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^6*d^3*x^9 - 3*c^4*d^3*x^7 + 3*c^2*
d^3*x^5 - d^3*x^3), x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^3}\,dx=\int -\frac{(b\arcsin(cx)+a)^2}{(c^2dx^2-d)^3x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^3,x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2/((c^2*d*x^2 - d)^3*x^3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^3}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^3\,(d-c^2\,d\,x^2)^3}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^3),x)
[Out] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^3), x)
```

3.209 $\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 572

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^3}\,dx = -\frac{b^2c^2}{2d^3x}+\frac{b^2c^2}{6d^3x(1-c^2x^2)}-\frac{b^2c^4x}{12d^3(1-c^2x^2)}+\frac{bc^3(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}}-\frac{bc(a+b\arcsin(cx))}{3d^3x^2(1-c^2x^2)^{3/2}}-\frac{29bc^3(a+b\arcsin(cx))}{12d^3\sqrt{1-c^2x^2}}-\frac{(a+b\arcsin(cx))^2}{3d^3x^3(1-c^2x^2)^2}-\frac{7c^2(a+b\arcsin(cx))^2}{3d^3x(1-c^2x^2)^2}+\frac{35c^4x(a+b\arcsin(cx))^2}{12d^3(1-c^2x^2)^2}+\frac{35c^4x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)}-\frac{35ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3}-\frac{38bc^3(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d^3}+\frac{17b^2c^3\text{arctanh}(cx)}{6d^3}+\frac{19ib^2c^3\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{3d^3}+\frac{35ibc^3(a+b\arcsin(cx))\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4d^3}-\frac{35ibc^3(a+b\arcsin(cx))\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4d^3}-\frac{19ib^2c^3\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{3d^3}-\frac{35b^2c^3\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4d^3}+\frac{35b^2c^3\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4d^3}$$

```
[Out] -1/2*b^2*c^2/d^3/x+1/6*b^2*c^2/d^3/x/(-c^2*x^2+1)-1/12*b^2*c^4*x/d^3/(-c^2*
x^2+1)+1/6*b*c^3*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^(3/2)-1/3*b*c*(a+b*arcs
in(c*x))/d^3/x^2/(-c^2*x^2+1)^(3/2)-1/3*(a+b*arcsin(c*x))^2/d^3/x^3/(-c^2*x
^2+1)^2-7/3*c^2*(a+b*arcsin(c*x))^2/d^3/x/(-c^2*x^2+1)^2+35/12*c^4*x*(a+b*a
rcsin(c*x))^2/d^3/(-c^2*x^2+1)^2+35/8*c^4*x*(a+b*arcsin(c*x))^2/d^3/(-c^2*x
^2+1)+35/4*I*b*c^3*(a+b*arcsin(c*x))*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)
))/d^3-38/3*b*c^3*(a+b*arcsin(c*x))*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))/d^3+1
7/6*b^2*c^3*arctanh(c*x)/d^3-19/3*I*b^2*c^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1
/2))/d^3-35/4*I*b*c^3*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/
2)))/d^3+19/3*I*b^2*c^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))/d^3-35/4*I*c^3
*(a+b*arcsin(c*x))^2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/d^3-35/4*b^2*c^3*poly
log(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d^3+35/4*b^2*c^3*polylog(3,I*(I*c*x+(-
c^2*x^2+1)^(1/2)))/d^3-29/12*b*c^3*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.87 (sec) , antiderivative size = 572, normalized size of antiderivative = 1.00, number of steps used = 43, number of rules used = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.630, Rules used = {4789, 4747, 4749, 4266, 2611, 2320, 6724, 4767, 212, 205, 4793, 4803, 4268, 2317, 2438, 296, 331}

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^3}\,dx = -\frac{35ic^3\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{4d^3} - \frac{38bc^3\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3d^3} + \frac{35ibc^3\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4d^3} - \frac{35ibc^3\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{4d^3} - \frac{7c^2(a+b\arcsin(cx))^2}{3d^3x(1-c^2x^2)^2} - \frac{bc(a+b\arcsin(cx))}{3d^3x^2(1-c^2x^2)^{3/2}} - \frac{(a+b\arcsin(cx))^2}{3d^3x^3(1-c^2x^2)^2} + \frac{35c^4x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} + \frac{35c^4x(a+b\arcsin(cx))^2}{12d^3(1-c^2x^2)^2} - \frac{29bc^3(a+b\arcsin(cx))}{12d^3\sqrt{1-c^2x^2}} + \frac{bc^3(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} + \frac{19ib^2c^3\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{3d^3} - \frac{19ib^2c^3\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{3d^3} - \frac{35b^2c^3\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4d^3} + \frac{35b^2c^3\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4d^3} + \frac{17b^2c^3\text{arctanh}(cx)}{6d^3} + \frac{b^2c^2}{6d^3x(1-c^2x^2)} - \frac{b^2c^2}{2d^3x} - \frac{b^2c^4x}{12d^3(1-c^2x^2)}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/2*(b^2*c^2)/(d^3*x) + (b^2*c^2)/(6*d^3*x*(1 - c^2*x^2)) - (b^2*c^4*x)/(1
2*d^3*(1 - c^2*x^2)) + (b*c^3*(a + b*ArcSin[c*x]))/(6*d^3*(1 - c^2*x^2)^(3/
2)) - (b*c*(a + b*ArcSin[c*x]))/(3*d^3*x^2*(1 - c^2*x^2)^(3/2)) - (29*b*c^3
*(a + b*ArcSin[c*x]))/(12*d^3*Sqrt[1 - c^2*x^2]) - (a + b*ArcSin[c*x])^2/(3
*d^3*x^3*(1 - c^2*x^2)^2) - (7*c^2*(a + b*ArcSin[c*x])^2)/(3*d^3*x*(1 - c^2
*x^2)^2) + (35*c^4*x*(a + b*ArcSin[c*x])^2)/(12*d^3*(1 - c^2*x^2)^2) + (35*
c^4*x*(a + b*ArcSin[c*x])^2)/(8*d^3*(1 - c^2*x^2)) - (((35*I)/4)*c^3*(a + b
*ArcSin[c*x])^2*ArcTan[E^(I*ArcSin[c*x])])/d^3 - (38*b*c^3*(a + b*ArcSin[c*
x])*ArcTanh[E^(I*ArcSin[c*x])])/(3*d^3) + (17*b^2*c^3*ArcTanh[c*x])/(6*d^3)
```

```
+ (((19*I)/3)*b^2*c^3*PolyLog[2, -E^(I*ArcSin[c*x])])/d^3 + (((35*I)/4)*b*
c^3*(a + b*ArcSin[c*x])*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/d^3 - (((35*I)/
4)*b*c^3*(a + b*ArcSin[c*x])*PolyLog[2, I*E^(I*ArcSin[c*x])])/d^3 - (((19*I
)/3)*b^2*c^3*PolyLog[2, E^(I*ArcSin[c*x])])/d^3 - (35*b^2*c^3*PolyLog[3, (-
I)*E^(I*ArcSin[c*x])])/(4*d^3) + (35*b^2*c^3*PolyLog[3, I*E^(I*ArcSin[c*x])
])/(4*d^3)
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 296

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-(
c*x)^(m + 1))*((a + b*x^n)^(p + 1)/(a*c*n*(p + 1))), x] + Dist[(m + n*(p +
1) + 1)/(a*n*(p + 1)), Int[(c*x)^m*(a + b*x^n)^(p + 1), x], x] /; FreeQ[{a,
 b, c, m}, x] && IGtQ[n, 0] && LtQ[p, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
```

```
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
```

```
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{(a+b\arcsin(cx))^2}{3d^3x^3\left(1-c^2x^2\right)^2}+\frac{1}{3}\left(7c^2\right)\int\frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^3}\,dx+\frac{(2bc)\int\frac{a+b\arcsin(cx)}{x^3\left(1-c^2x^2\right)^{5/2}}\,dx}{3d^3}\\
&= -\frac{bc(a+b\arcsin(cx))}{3d^3x^2\left(1-c^2x^2\right)^{3/2}}-\frac{(a+b\arcsin(cx))^2}{3d^3x^3\left(1-c^2x^2\right)^2}-\frac{7c^2(a+b\arcsin(cx))^2}{3d^3x\left(1-c^2x^2\right)^2}\\
&\quad+\frac{1}{3}\left(35c^4\right)\int\frac{(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^3}\,dx+\frac{\left(b^2c^2\right)\int\frac{1}{x^2\left(1-c^2x^2\right)^2}\,dx}{3d^3}\\
&\quad+\frac{\left(5bc^3\right)\int\frac{a+b\arcsin(cx)}{x\left(1-c^2x^2\right)^{5/2}}\,dx}{3d^3}+\frac{\left(14bc^3\right)\int\frac{a+b\arcsin(cx)}{x\left(1-c^2x^2\right)^{5/2}}\,dx}{3d^3}\\
&= \frac{b^2c^2}{6d^3x\left(1-c^2x^2\right)}+\frac{19bc^3(a+b\arcsin(cx))}{9d^3\left(1-c^2x^2\right)^{3/2}}-\frac{bc(a+b\arcsin(cx))}{3d^3x^2\left(1-c^2x^2\right)^{3/2}}\\
&\quad-\frac{(a+b\arcsin(cx))^2}{3d^3x^3\left(1-c^2x^2\right)^2}-\frac{7c^2(a+b\arcsin(cx))^2}{3d^3x\left(1-c^2x^2\right)^2}+\frac{35c^4x(a+b\arcsin(cx))^2}{12d^3\left(1-c^2x^2\right)^2}\\
&\quad+\frac{\left(b^2c^2\right)\int\frac{1}{x^2\left(1-c^2x^2\right)}\,dx}{2d^3}+\frac{\left(5bc^3\right)\int\frac{a+b\arcsin(cx)}{x\left(1-c^2x^2\right)^{3/2}}\,dx}{3d^3}+\frac{\left(14bc^3\right)\int\frac{a+b\arcsin(cx)}{x\left(1-c^2x^2\right)^{3/2}}\,dx}{3d^3}\\
&\quad-\frac{\left(5b^2c^4\right)\int\frac{1}{\left(1-c^2x^2\right)^2}\,dx}{9d^3}-\frac{\left(14b^2c^4\right)\int\frac{1}{\left(1-c^2x^2\right)^2}\,dx}{9d^3}-\frac{\left(35bc^5\right)\int\frac{x(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{5/2}}\,dx}{6d^3}\\
&\quad+\frac{\left(35c^4\right)\int\frac{(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^2}\,dx}{4d}\\
&= -\frac{b^2c^2}{2d^3x}+\frac{b^2c^2}{6d^3x\left(1-c^2x^2\right)}-\frac{19b^2c^4x}{18d^3\left(1-c^2x^2\right)}+\frac{bc^3(a+b\arcsin(cx))}{6d^3\left(1-c^2x^2\right)^{3/2}}\\
&\quad-\frac{bc(a+b\arcsin(cx))}{3d^3x^2\left(1-c^2x^2\right)^{3/2}}+\frac{19bc^3(a+b\arcsin(cx))}{3d^3\sqrt{1-c^2x^2}}-\frac{(a+b\arcsin(cx))^2}{3d^3x^3\left(1-c^2x^2\right)^2}\\
&\quad-\frac{7c^2(a+b\arcsin(cx))^2}{3d^3x\left(1-c^2x^2\right)^2}+\frac{35c^4x(a+b\arcsin(cx))^2}{12d^3\left(1-c^2x^2\right)^2}+\frac{35c^4x(a+b\arcsin(cx))^2}{8d^3\left(1-c^2x^2\right)}\\
&\quad+\frac{\left(5bc^3\right)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{3d^3}+\frac{\left(14bc^3\right)\int\frac{a+b\arcsin(cx)}{x\sqrt{1-c^2x^2}}\,dx}{3d^3}\\
&\quad-\frac{\left(5b^2c^4\right)\int\frac{1}{1-c^2x^2}\,dx}{18d^3}+\frac{\left(b^2c^4\right)\int\frac{1}{1-c^2x^2}\,dx}{2d^3}-\frac{\left(7b^2c^4\right)\int\frac{1}{1-c^2x^2}\,dx}{9d^3}\\
&\quad-\frac{\left(5b^2c^4\right)\int\frac{1}{1-c^2x^2}\,dx}{3d^3}+\frac{\left(35b^2c^4\right)\int\frac{1}{\left(1-c^2x^2\right)^2}\,dx}{18d^3}-\frac{\left(14b^2c^4\right)\int\frac{1}{1-c^2x^2}\,dx}{3d^3}\\
&\quad-\frac{\left(35bc^5\right)\int\frac{x(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{3/2}}\,dx}{4d^3}+\frac{\left(35c^4\right)\int\frac{(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{8d^2}
\end{aligned}
$$

$$= -\frac{b^2c^2}{2d^3x} + \frac{b^2c^2}{6d^3x(1-c^2x^2)} - \frac{b^2c^4x}{12d^3(1-c^2x^2)} + \frac{bc^3(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(a+b\arcsin(cx))}{3d^3x^2(1-c^2x^2)^{3/2}} - \frac{29bc^3(a+b\arcsin(cx))}{12d^3\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{3d^3x^3(1-c^2x^2)^2} - \frac{7c^2(a+b\arcsin(cx))^2}{3d^3x(1-c^2x^2)^2} + \frac{35c^4x(a+b\arcsin(cx))^2}{12d^3(1-c^2x^2)^2} + \frac{35c^4x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} - \frac{62b^2c^3\operatorname{arctanh}(cx)}{9d^3} + \frac{(35c^3)\operatorname{Subst}\left(\int(a+bx)^2\sec(x)\,dx, x, \arcsin(cx)\right)}{8d^3} + \frac{(5bc^3)\operatorname{Subst}(\int(a+bx)\csc(x)\,dx, x, \arcsin(cx))}{3d^3} + \frac{(14bc^3)\operatorname{Subst}(\int(a+bx)\csc(x)\,dx, x, \arcsin(cx))}{3d^3} + \frac{(35b^2c^4)\int\frac{1}{1-c^2x^2}\,dx}{36d^3} + \frac{(35b^2c^4)\int\frac{1}{1-c^2x^2}\,dx}{4d^3}$$

$$= -\frac{b^2c^2}{2d^3x} + \frac{b^2c^2}{6d^3x(1-c^2x^2)} - \frac{b^2c^4x}{12d^3(1-c^2x^2)} + \frac{bc^3(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(a+b\arcsin(cx))}{3d^3x^2(1-c^2x^2)^{3/2}} - \frac{29bc^3(a+b\arcsin(cx))}{12d^3\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{3d^3x^3(1-c^2x^2)^2} - \frac{7c^2(a+b\arcsin(cx))^2}{3d^3x(1-c^2x^2)^2} + \frac{35c^4x(a+b\arcsin(cx))^2}{12d^3(1-c^2x^2)^2} + \frac{35c^4x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} - \frac{35ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} - \frac{38bc^3(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d^3} + \frac{17b^2c^3\operatorname{arctanh}(cx)}{6d^3} - \frac{(35bc^3)\operatorname{Subst}\left(\int(a+bx)\log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{4d^3} + \frac{(35bc^3)\operatorname{Subst}\left(\int(a+bx)\log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{4d^3} - \frac{(5b^2c^3)\operatorname{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{3d^3} + \frac{(5b^2c^3)\operatorname{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{3d^3} - \frac{(14b^2c^3)\operatorname{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{3d^3} + \frac{(14b^2c^3)\operatorname{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{3d^3}$$

$$= -\frac{b^2c^2}{2d^3x} + \frac{b^2c^2}{6d^3x(1-c^2x^2)} - \frac{b^2c^4x}{12d^3(1-c^2x^2)} + \frac{bc^3(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(a+b\arcsin(cx))}{3d^3x^2(1-c^2x^2)^{3/2}} - \frac{29bc^3(a+b\arcsin(cx))}{12d^3\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{3d^3x^3(1-c^2x^2)^2} - \frac{7c^2(a+b\arcsin(cx))^2}{3d^3x(1-c^2x^2)^2} + \frac{35c^4x(a+b\arcsin(cx))^2}{12d^3(1-c^2x^2)^2} + \frac{35c^4x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} - \frac{35ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} - \frac{38bc^3(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d^3} + \frac{17b^2c^3\text{arctanh}(cx)}{6d^3} + \frac{35ibc^3(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4d^3} - \frac{35ibc^3(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4d^3} + \frac{(5ib^2c^3)\operatorname{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3d^3} - \frac{(5ib^2c^3)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3d^3} + \frac{(14ib^2c^3)\operatorname{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3d^3} - \frac{(14ib^2c^3)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3d^3} - \frac{(35ib^2c^3)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{4d^3} + \frac{(35ib^2c^3)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{4d^3}$$

$$= -\frac{b^2c^2}{2d^3x} + \frac{b^2c^2}{6d^3x(1-c^2x^2)} - \frac{b^2c^4x}{12d^3(1-c^2x^2)} + \frac{bc^3(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(a+b\arcsin(cx))}{3d^3x^2(1-c^2x^2)^{3/2}} - \frac{29bc^3(a+b\arcsin(cx))}{12d^3\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{3d^3x^3(1-c^2x^2)^2} - \frac{7c^2(a+b\arcsin(cx))^2}{3d^3x(1-c^2x^2)^2} + \frac{35c^4x(a+b\arcsin(cx))^2}{12d^3(1-c^2x^2)^2} + \frac{35c^4x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} - \frac{35ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} - \frac{38bc^3(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d^3} + \frac{17b^2c^3\text{arctanh}(cx)}{6d^3} + \frac{19ib^2c^3\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{3d^3} + \frac{35ibc^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4d^3} - \frac{35ibc^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4d^3} - \frac{19ib^2c^3\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{3d^3} - \frac{(35b^2c^3)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{4d^3} + \frac{(35b^2c^3)\,\text{Subst}\left(\int\frac{\text{PolyLog}(2,ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{4d^3}$$

$$= -\frac{b^2c^2}{2d^3x} + \frac{b^2c^2}{6d^3x(1-c^2x^2)} - \frac{b^2c^4x}{12d^3(1-c^2x^2)} + \frac{bc^3(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(a+b\arcsin(cx))}{3d^3x^2(1-c^2x^2)^{3/2}} - \frac{29bc^3(a+b\arcsin(cx))}{12d^3\sqrt{1-c^2x^2}} - \frac{(a+b\arcsin(cx))^2}{3d^3x^3(1-c^2x^2)^2} - \frac{7c^2(a+b\arcsin(cx))^2}{3d^3x(1-c^2x^2)^2} + \frac{35c^4x(a+b\arcsin(cx))^2}{12d^3(1-c^2x^2)^2} + \frac{35c^4x(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} - \frac{35ic^3(a+b\arcsin(cx))^2\arctan\left(e^{i\arcsin(cx)}\right)}{4d^3} - \frac{38bc^3(a+b\arcsin(cx))\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{3d^3} + \frac{17b^2c^3\text{arctanh}(cx)}{6d^3} + \frac{19ib^2c^3\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{3d^3} + \frac{35ibc^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{4d^3} - \frac{35ibc^3(a+b\arcsin(cx))\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{4d^3} - \frac{19ib^2c^3\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{3d^3} - \frac{35b^2c^3\,\text{PolyLog}\left(3,-ie^{i\arcsin(cx)}\right)}{4d^3} + \frac{35b^2c^3\,\text{PolyLog}\left(3,ie^{i\arcsin(cx)}\right)}{4d^3}$$

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1657 vs. 2(572) = 1144.

Time = 12.71 (sec) , antiderivative size = 1657, normalized size of antiderivative = 2.90

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^3}\,dx = -\frac{a^2}{3d^3x^3}-\frac{3a^2c^2}{d^3x}+\frac{a^2c^4x}{4d^3\left(-1+c^2x^2\right)^2} -\frac{11a^2c^4x}{8d^3\left(-1+c^2x^2\right)}-\frac{35a^2c^3\log(1-cx)}{16d^3}+\frac{35a^2c^3\log(1+cx)}{16d^3} -\frac{2ab\left(\frac{c^3\left((2-cx)\sqrt{1-c^2x^2}-3\arcsin(cx)\right)}{48(-1+cx)^2}-\frac{11c^3\left(\sqrt{1-c^2x^2}-\arcsin(cx)\right)}{16(-1+cx)}+\frac{11c^4\left(\sqrt{1-c^2x^2}+\arcsin(cx)\right)}{16(c+c^2x)}+\frac{c^3\left((2+cx)\sqrt{1-c^2x^2}+3\arcsin(cx)\right)}{48(1+cx)^2}\cdots\right.}{\cdots} -\frac{b^2c^3\left(-\frac{19}{3}i\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)+\frac{19}{3}i\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)+\frac{1}{24}\left(68\arcsin(cx)+35\arcsin(cx)^3-\cdots\right.\right.}{\cdots}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^3),x]
```

```
[Out] -1/3*a^2/(d^3*x^3) - (3*a^2*c^2)/(d^3*x) + (a^2*c^4*x)/(4*d^3*(-1 + c^2*x^2
)^2) - (11*a^2*c^4*x)/(8*d^3*(-1 + c^2*x^2)) - (35*a^2*c^3*Log[1 - c*x])/(1
6*d^3) + (35*a^2*c^3*Log[1 + c*x])/(16*d^3) - (2*a*b*((c^3*((2 - c*x)*Sqrt[
1 - c^2*x^2] - 3*ArcSin[c*x]))/(48*(-1 + c*x)^2) - (11*c^3*(Sqrt[1 - c^2*x^
2] - ArcSin[c*x]))/(16*(-1 + c*x)) + (11*c^4*(Sqrt[1 - c^2*x^2] + ArcSin[c*
x]))/(16*(c + c^2*x)) + (c^3*((2 + c*x)*Sqrt[1 - c^2*x^2] + 3*ArcSin[c*x]))
/(48*(1 + c*x)^2) - 3*c^2*(-(ArcSin[c*x]/x) - c*ArcTanh[Sqrt[1 - c^2*x^2]])
 + (c*x*Sqrt[1 - c^2*x^2] + 2*ArcSin[c*x] + c^3*x^3*ArcTanh[Sqrt[1 - c^2*x^
2]])/(6*x^3) + (35*c^4*((((3*I)/2)*Pi*ArcSin[c*x])/c - ((I/2)*ArcSin[c*x]^2
)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c - (Pi*Log[1 + I*E^(I*ArcSin[c*
x])])/c + (2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])])/c - (2*Pi*Log[Cos[Ar
cSin[c*x]/2]])/c + (Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]])/c - ((2*I)*PolyLo
g[2, (-I)*E^(I*ArcSin[c*x])])/c))/16 - (35*c^4*(((I/2)*Pi*ArcSin[c*x])/c -
((I/2)*ArcSin[c*x]^2)/c + (2*Pi*Log[1 + E^((-I)*ArcSin[c*x])])/c + (Pi*Log[
1 - I*E^(I*ArcSin[c*x])])/c + (2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])])/
c - (2*Pi*Log[Cos[ArcSin[c*x]/2]])/c - (Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]
)/c - ((2*I)*PolyLog[2, I*E^(I*ArcSin[c*x])])/c))/16))/d^3 - (b^2*c^3*(((-1
9*I)/3)*PolyLog[2, -E^(I*ArcSin[c*x])] + ((19*I)/3)*PolyLog[2, E^(I*ArcSin[
c*x])] + (68*ArcSin[c*x] + 35*ArcSin[c*x]^3 - 105*ArcSin[c*x]^2*Log[1 - I*E
^(I*ArcSin[c*x])] - 105*Pi*ArcSin[c*x]*Log[((-1)^(1/4)*(1 - I*E^(I*ArcSin[c
*x])))/(2*E^((I/2)*ArcSin[c*x]))] + 105*ArcSin[c*x]^2*Log[1 + I*E^(I*ArcSin
[c*x])] + 105*ArcSin[c*x]^2*Log[((1/2 + I/2)*(-I + E^(I*ArcSin[c*x])))/E^((
I/2)*ArcSin[c*x])] - 105*Pi*ArcSin[c*x]*Log[-1/2*((-1)^(1/4)*(-I + E^(I*Arc
Sin[c*x])))/E^((I/2)*ArcSin[c*x])] - 105*ArcSin[c*x]^2*Log[((1 + I) + (1 -
I)*E^(I*ArcSin[c*x]))/(2*E^((I/2)*ArcSin[c*x]))] + 105*Pi*ArcSin[c*x]*Log[-
Cos[(Pi + 2*ArcSin[c*x])/4]] + 68*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/
```

```
2]] - 105*ArcSin[c*x]^2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 68*L
og[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + 105*ArcSin[c*x]^2*Log[Cos[Arc
Sin[c*x]/2] + Sin[ArcSin[c*x]/2]] + 105*Pi*ArcSin[c*x]*Log[Sin[(Pi + 2*ArcS
in[c*x])/4]] - (210*I)*ArcSin[c*x]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (21
0*I)*ArcSin[c*x]*PolyLog[2, I*E^(I*ArcSin[c*x])] + 210*PolyLog[3, (-I)*E^(I
*ArcSin[c*x])] - 210*PolyLog[3, I*E^(I*ArcSin[c*x])])/24 + (24 - 204*c*x*Ar
cSin[c*x] + 204*ArcSin[c*x]^2 - 105*c*x*ArcSin[c*x]^3 + (20 + 658*ArcSin[c*
x]^2)*Cos[2*ArcSin[c*x]] - 4*(6 + 35*ArcSin[c*x]^2)*Cos[4*ArcSin[c*x]] - 20
*Cos[6*ArcSin[c*x]] - 210*ArcSin[c*x]^2*Cos[6*ArcSin[c*x]] - 456*c*x*ArcSin
[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 456*c*x*ArcSin[c*x]*Log[1 + E^(I*ArcSin[
c*x])] + 540*ArcSin[c*x]*Sin[2*ArcSin[c*x]] - 204*ArcSin[c*x]*Sin[3*ArcSin[
c*x]] - 105*ArcSin[c*x]^3*Sin[3*ArcSin[c*x]] - 456*ArcSin[c*x]*Log[1 - E^(I
*ArcSin[c*x])]*Sin[3*ArcSin[c*x]] + 456*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x
])]*Sin[3*ArcSin[c*x]] + 32*ArcSin[c*x]*Sin[4*ArcSin[c*x]] + 68*ArcSin[c*x]
*Sin[5*ArcSin[c*x]] + 35*ArcSin[c*x]^3*Sin[5*ArcSin[c*x]] + 152*ArcSin[c*x]
*Log[1 - E^(I*ArcSin[c*x])]*Sin[5*ArcSin[c*x]] - 152*ArcSin[c*x]*Log[1 + E^
(I*ArcSin[c*x])]*Sin[5*ArcSin[c*x]] - 116*ArcSin[c*x]*Sin[6*ArcSin[c*x]] +
68*ArcSin[c*x]*Sin[7*ArcSin[c*x]] + 35*ArcSin[c*x]^3*Sin[7*ArcSin[c*x]] + 1
52*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])]*Sin[7*ArcSin[c*x]] - 152*ArcSin[c
*x]*Log[1 + E^(I*ArcSin[c*x])]*Sin[7*ArcSin[c*x]])/(1536*c^3*x^3*(1 - c^2*x
^2)^2)))/d^3
```

Maple [A] (verified)

Time = 0.68 (sec) , antiderivative size = 821, normalized size of antiderivative = 1.44

method	result
derivativedivides	$c^3\left(-\frac{a^2\left(\frac{1}{3c^3x^3}+\frac{3}{cx}-\frac{1}{16(cx-1)^2}+\frac{11}{16(cx-1)}+\frac{35\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}+\frac{11}{16(cx+1)}-\frac{35\ln(cx+1)}{16}\right)}{d^3}-b^2\left(105\arcsin(cx)^2c^6x\right.\right.$
default	$c^3\left(-\frac{a^2\left(\frac{1}{3c^3x^3}+\frac{3}{cx}-\frac{1}{16(cx-1)^2}+\frac{11}{16(cx-1)}+\frac{35\ln(cx-1)}{16}+\frac{1}{16(cx+1)^2}+\frac{11}{16(cx+1)}-\frac{35\ln(cx+1)}{16}\right)}{d^3}-b^2\left(105\arcsin(cx)^2c^6x\right.\right.$
parts	$-\frac{a^2\left(\frac{1}{3x^3}+\frac{3c^2}{x}-\frac{c^3}{16(cx-1)^2}+\frac{11c^3}{16(cx-1)}+\frac{35c^3\ln(cx-1)}{16}+\frac{c^3}{16(cx+1)^2}+\frac{11c^3}{16(cx+1)}-\frac{35c^3\ln(cx+1)}{16}\right)}{d^3}-b^2c^3\left(105\arcsin(cx)^2c^6x\right.$

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] c^3*(-a^2/d^3*(1/3/c^3/x^3+3/c/x-1/16/(c*x-1)^2+11/16/(c*x-1)+35/16*ln(c*x-
1)+1/16/(c*x+1)^2+11/16/(c*x+1)-35/16*ln(c*x+1))-b^2/d^3*(1/24*(105*arcsin(
c*x)^2*c^6*x^6-58*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5*x^5-175*arcsin(c*x)^2*
x^4*c^4+10*c^6*x^6+54*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3*x^3+56*arcsin(c*x)
^2*x^2*c^2-18*c^4*x^4+8*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c+8*arcsin(c*x)^2+
```

```
8*c^2*x^2)/(c^4*x^4-2*c^2*x^2+1)/c^3/x^3+35/8*arcsin(c*x)^2*ln(1+I*(I*c*x+(
-c^2*x^2+1)^(1/2)))-35/4*I*arcsin(c*x)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/
2)))+35/4*polylog(3,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-35/8*arcsin(c*x)^2*ln(1-
I*(I*c*x+(-c^2*x^2+1)^(1/2)))+35/4*I*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x
^2+1)^(1/2)))-35/4*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-19/3*I*dilog(I*c
*x+(-c^2*x^2+1)^(1/2))-19/3*I*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+17/3*I*arct
an(I*c*x+(-c^2*x^2+1)^(1/2))+19/3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2)
))-2*a*b/d^3*(1/24*(105*arcsin(c*x)*c^6*x^6-29*c^5*x^5*(-c^2*x^2+1)^(1/2)-1
75*c^4*x^4*arcsin(c*x)+27*c^3*x^3*(-c^2*x^2+1)^(1/2)+56*c^2*x^2*arcsin(c*x)
+4*c*x*(-c^2*x^2+1)^(1/2)+8*arcsin(c*x))/(c^4*x^4-2*c^2*x^2+1)/c^3/x^3+35/8
*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-19/6*ln(I*c*x+(-c^2*x^2+1)^
(1/2)-1)-35/8*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+19/6*ln(1+I*c*
x+(-c^2*x^2+1)^(1/2))-35/8*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+35/8*I*d
ilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^3}\,dx=\int -\frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(c^2dx^2-d\right)^3x^4}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^3,x, algorithm="fricas")

[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^6*d^3*x^10 - 3*c^4*d^3*x^8 + 3*c^2*d^3*x^6 - d^3*x^4), x)

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^3}\,dx=-\frac{\int \frac{a^2}{c^6x^{10}-3c^4x^8+3c^2x^6-x^4}\,dx+\int \frac{b^2\operatorname{asin}^2\left(cx\right)}{c^6x^{10}-3c^4x^8+3c^2x^6-x^4}\,dx+\int \frac{2ab\operatorname{asin}\left(cx\right)}{c^6x^{10}-3c^4x^8+3c^2x^6-x^4}\,dx}{d^3}$$

[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**3,x)

[Out] -(Integral(a**2/(c**6*x**10 - 3*c**4*x**8 + 3*c**2*x**6 - x**4), x) + Integral(b**2*asin(c*x)**2/(c**6*x**10 - 3*c**4*x**8 + 3*c**2*x**6 - x**4), x) + Integral(2*a*b*asin(c*x)/(c**6*x**10 - 3*c**4*x**8 + 3*c**2*x**6 - x**4), x))/d**3

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^3}\,dx = \int -\frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(c^2dx^2-d\right)^3x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/48*a^2*(105*c^3*log(c*x + 1)/d^3 - 105*c^3*log(c*x - 1)/d^3 - 2*(105*c^6*
x^6 - 175*c^4*x^4 + 56*c^2*x^2 + 8)/(c^4*d^3*x^7 - 2*c^2*d^3*x^5 + d^3*x^3)
) + 1/48*(105*(b^2*c^7*x^7 - 2*b^2*c^5*x^5 + b^2*c^3*x^3)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1))^2*log(c*x + 1) - 105*(b^2*c^7*x^7 - 2*b^2*c^5*x^5
 + b^2*c^3*x^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log(-c*x + 1)
- 2*(105*b^2*c^6*x^6 - 175*b^2*c^4*x^4 + 56*b^2*c^2*x^2 + 8*b^2)*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 48*(c^4*d^3*x^7 - 2*c^2*d^3*x^5 + d^3*
x^3)*integrate(-1/24*(48*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (
105*(b^2*c^8*x^8 - 2*b^2*c^6*x^6 + b^2*c^4*x^4)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))*log(c*x + 1) - 105*(b^2*c^8*x^8 - 2*b^2*c^6*x^6 + b^2*c^4*x
^4)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*log(-c*x + 1) - 2*(105*b^2*c
^7*x^7 - 175*b^2*c^5*x^5 + 56*b^2*c^3*x^3 + 8*b^2*c*x)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^10 - 3*c^4
*d^3*x^8 + 3*c^2*d^3*x^6 - d^3*x^4), x))/(c^4*d^3*x^7 - 2*c^2*d^3*x^5 + d^3
*x^3)
```

Giac [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^3}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^3}\,dx = \int \frac{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}{x^4\,\left(d-c^2\,d\,x^2\right)^3}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^3),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^3), x)
```

3.210 $\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 29, antiderivative size = 374

$$\begin{aligned}\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx &= \frac{52b^2\sqrt{d-c^2dx^2}}{225c^4}+\frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}\\ &\quad+\frac{26b^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{675c^4}\\ &\quad-\frac{2b^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^4}\\ &\quad+\frac{4b^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{15c^3\sqrt{1-c^2x^2}}\\ &\quad+\frac{2bx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45c\sqrt{1-c^2x^2}}\\ &\quad-\frac{2bcx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}\\ &\quad-\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4}\\ &\quad-\frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^2}\\ &\quad+\frac{1}{5}x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\end{aligned}$$

```
[Out] 52/225*b^2*(-c^2*d*x^2+d)^(1/2)/c^4+26/675*b^2*(-c^2*x^2+1)*(-c^2*d*x^2+d)^
(1/2)/c^4-2/125*b^2*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^4-2/15*(a+b*arcsi
n(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4-1/15*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2
+d)^(1/2)/c^2+1/5*x^4*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+4/15*a*b*x*(
-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+4/15*b^2*x*arcsin(c*x)*(-c^2*d*x
^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+2/45*b*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2
+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/25*b*c*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d
)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 374, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.276, Rules used = {4783, 4795, 4767, 4715, 267, 4723, 272, 45}

$$\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = -\frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^2} - \frac{2bcx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + \frac{1}{5}x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{2bx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45c\sqrt{1-c^2x^2}} - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4} + \frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}} + \frac{4b^2x\arcsin(cx)\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}} - \frac{2b^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^4} + \frac{26b^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{675c^4} + \frac{52b^2\sqrt{d-c^2dx^2}}{225c^4}$$

```
[In] Int[x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (52*b^2*Sqrt[d - c^2*d*x^2])/(225*c^4) + (4*a*b*x*Sqrt[d - c^2*d*x^2])/(15*
c^3*Sqrt[1 - c^2*x^2]) + (26*b^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/(675*c^
4) - (2*b^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(125*c^4) + (4*b^2*x*Sqrt[
d - c^2*d*x^2]*ArcSin[c*x])/(15*c^3*Sqrt[1 - c^2*x^2]) + (2*b*x^3*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x]))/(45*c*Sqrt[1 - c^2*x^2]) - (2*b*c*x^5*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(25*Sqrt[1 - c^2*x^2]) - (2*Sqrt[d - c^
2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^4) - (x^2*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])^2)/(15*c^2) + (x^4*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/
5
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
```

```
NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
```

```
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{5}x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{\sqrt{d-c^2dx^2}\int\frac{x^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{5\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(2bc\sqrt{d-c^2dx^2}\right)\int x^4(a+b\arcsin(cx))\,dx}{5\sqrt{1-c^2x^2}} \\
&= -\frac{2bcx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}-\frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^2} \\
&\quad+\frac{1}{5}x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{\left(2\sqrt{d-c^2dx^2}\right)\int\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{15c^2\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(2b\sqrt{d-c^2dx^2}\right)\int x^2(a+b\arcsin(cx))\,dx}{15c\sqrt{1-c^2x^2}}+\frac{\left(2b^2c^2\sqrt{d-c^2dx^2}\right)\int\frac{x^5}{\sqrt{1-c^2x^2}}\,dx}{25\sqrt{1-c^2x^2}} \\
&= \frac{2bx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45c\sqrt{1-c^2x^2}}-\frac{2bcx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} \\
&\quad-\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4}-\frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^2} \\
&\quad+\frac{1}{5}x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{\left(2b^2\sqrt{d-c^2dx^2}\right)\int\frac{x^3}{\sqrt{1-c^2x^2}}\,dx}{45\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(4b\sqrt{d-c^2dx^2}\right)\int(a+b\arcsin(cx))\,dx}{15c^3\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(b^2c^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{x^2}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{25\sqrt{1-c^2x^2}} \\
&= \frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}+\frac{2bx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45c\sqrt{1-c^2x^2}} \\
&\quad-\frac{2bcx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}-\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4} \\
&\quad-\frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^2}+\frac{1}{5}x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad-\frac{\left(b^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{x}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{45\sqrt{1-c^2x^2}}+\frac{\left(4b^2\sqrt{d-c^2dx^2}\right)\int\arcsin(cx)\,dx}{15c^3\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(b^2c^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{c^4\sqrt{1-c^2x}}-\frac{2\sqrt{1-c^2x}}{c^4}+\frac{(1-c^2x)^{3/2}}{c^4}\right)dx,x,x^2\right)}{25\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{2b^2\sqrt{d-c^2dx^2}}{25c^4} + \frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}} + \frac{4b^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{75c^4} \\
&\quad - \frac{2b^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^4} + \frac{4b^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{15c^3\sqrt{1-c^2x^2}} \\
&\quad + \frac{2bx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45c\sqrt{1-c^2x^2}} - \frac{2bcx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} \\
&\quad - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4} - \frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^2} \\
&\quad + \frac{1}{5}x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{\left(b^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{c^2\sqrt{1-c^2x}}-\frac{\sqrt{1-c^2x}}{c^2}\right)dx,x,x^2\right)}{45\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(4b^2\sqrt{d-c^2dx^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}dx}{15c^2\sqrt{1-c^2x^2}} \\
&= \frac{52b^2\sqrt{d-c^2dx^2}}{225c^4} + \frac{4abx\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}} + \frac{26b^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{675c^4} \\
&\quad - \frac{2b^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^4} + \frac{4b^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{15c^3\sqrt{1-c^2x^2}} \\
&\quad + \frac{2bx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45c\sqrt{1-c^2x^2}} \\
&\quad - \frac{2bcx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4} \\
&\quad - \frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^2} + \frac{1}{5}x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 242, normalized size of antiderivative = 0.65

$$
\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx
$$

$$
= \frac{\sqrt{d-c^2dx^2}\left(225a^2\sqrt{1-c^2x^2}(-2-c^2x^2+3c^4x^4)-30abcx(-30-5c^2x^2+9c^4x^4)-2b^2\sqrt{1-c^2x^2}(-428\right.}{}
$$

```
[In] Integrate[x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(225*a^2*Sqrt[1 - c^2*x^2]*(-2 - c^2*x^2 + 3*c^4*x^4)
- 30*a*b*c*x*(-30 - 5*c^2*x^2 + 9*c^4*x^4) - 2*b^2*Sqrt[1 - c^2*x^2]*(-428
+ 11*c^2*x^2 + 27*c^4*x^4) - 30*b*(15*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2 - 3*
c^4*x^4) + b*c*x*(-30 - 5*c^2*x^2 + 9*c^4*x^4))*ArcSin[c*x] + 225*b^2*Sqrt[
1 - c^2*x^2]*(-2 - c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x]^2))/(3375*c^4*Sqrt[1 -
c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.64 (sec) , antiderivative size = 1165, normalized size of antiderivative = 3.11

method	result	size
default	Expression too large to display	1165
parts	Expression too large to display	1165

```
[In] int(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/5*x^2*(-c^2*d*x^2+d)^(3/2)/c^2/d-2/15/d/c^4*(-c^2*d*x^2+d)^(3/2))+b
^2*(1/4000*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^
(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(
1/2)*x*c-1)*(10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)/c^4/(c^2*x^2-1)+1/864*(-d
*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I
*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^4/(c^2*x^2
-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsi
n(c*x)^2-2+2*I*arcsin(c*x))/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*
(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^4/(c^
2*x^2-1)+1/864*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4
*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x
)^2-2)/c^4/(c^2*x^2-1)+1/4000*(-d*(c^2*x^2-1))^(1/2)*(16*I*c^5*x^5*(-c^2*x^
2+1)^(1/2)+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*
x^2+1)^(1/2)*x*c+13*c^2*x^2-1)*(-10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)/c^4/(
c^2*x^2-1))+2*a*b*(1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I
*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*
(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c*x))/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x
^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^4/(c^2*
x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(ar
csin(c*x)-I)/c^4/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^
2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcs
in(c*x))/c^4/(c^2*x^2-1)-1/3600*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2
)*x*c+c^2*x^2-1)*(17*I+15*arcsin(c*x))*cos(4*arcsin(c*x))/c^4/(c^2*x^2-1)-1
/900*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(2*I+15*ar
csin(c*x))*sin(4*arcsin(c*x))/c^4/(c^2*x^2-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 277, normalized size of antiderivative = 0.74

$$\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\frac{30\left(9\,abc^5x^5-5\,abc^3x^3-30\,abcx+\left(9\,b^2c^5x^5-5\,b^2c^3x^3-30\,b^2cx\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}}{}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] 1/3375*(30*(9*a*b*c^5*x^5 - 5*a*b*c^3*x^3 - 30*a*b*c*x + (9*b^2*c^5*x^5 - 5
*b^2*c^3*x^3 - 30*b^2*c*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2
+ 1) + (27*(25*a^2 - 2*b^2)*c^6*x^6 - 4*(225*a^2 - 8*b^2)*c^4*x^4 - (225*a^
2 - 878*b^2)*c^2*x^2 + 225*(3*b^2*c^6*x^6 - 4*b^2*c^4*x^4 - b^2*c^2*x^2 + 2
*b^2)*arcsin(c*x)^2 + 450*a^2 - 856*b^2 + 450*(3*a*b*c^6*x^6 - 4*a*b*c^4*x^
4 - a*b*c^2*x^2 + 2*a*b)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^6*x^2 - c^4)
```

Sympy [F]

$$\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int x^3\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\operatorname{asin}\,(cx))^2\;dx$$

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**3*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 311, normalized size of antiderivative = 0.83

$$\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$= -\frac{1}{15}\,b^2\left(\frac{3\,(-c^2dx^2+d)^{\frac{3}{2}}x^2}{c^2d}+\frac{2\,(-c^2dx^2+d)^{\frac{3}{2}}}{c^4d}\right)\arcsin{(cx)}^2 - \frac{2}{15}\,ab\left(\frac{3\,(-c^2dx^2+d)^{\frac{3}{2}}x^2}{c^2d}+\frac{2\,(-c^2dx^2+d)^{\frac{3}{2}}}{c^4d}\right)\arcsin{(cx)} - \frac{1}{15}\,a^2\left(\frac{3\,(-c^2dx^2+d)^{\frac{3}{2}}x^2}{c^2d}+\frac{2\,(-c^2dx^2+d)^{\frac{3}{2}}}{c^4d}\right) - \frac{2}{3375}\,b^2\left(\frac{27\,\sqrt{-c^2x^2+1}c^2\sqrt{d}x^4+11\,\sqrt{-c^2x^2+1}\sqrt{d}x^2-\frac{428\,\sqrt{-c^2x^2+1}\sqrt{d}}{c^2}}{c^2}+\frac{15\left(9\,c^4\sqrt{d}x^5-5\,c^2\sqrt{d}x^3-\right.}{c^3}\right. - \frac{2\left(9\,c^4\sqrt{d}x^5-5\,c^2\sqrt{d}x^3-30\,\sqrt{d}x\right)ab}{225\,c^3}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] -1/15*b^2*(3*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(3/2)/
(c^4*d))*arcsin(c*x)^2 - 2/15*a*b*(3*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^2*d) + 2
*(-c^2*d*x^2 + d)^(3/2)/(c^4*d))*arcsin(c*x) - 1/15*a^2*(3*(-c^2*d*x^2 + d)
^(3/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(3/2)/(c^4*d)) - 2/3375*b^2*((27*sq
rt(-c^2*x^2 + 1)*c^2*sqrt(d)*x^4 + 11*sqrt(-c^2*x^2 + 1)*sqrt(d)*x^2 - 428*
sqrt(-c^2*x^2 + 1)*sqrt(d)/c^2)/c^2 + 15*(9*c^4*sqrt(d)*x^5 - 5*c^2*sqrt(d)
*x^3 - 30*sqrt(d)*x)*arcsin(c*x)/c^3) - 2/225*(9*c^4*sqrt(d)*x^5 - 5*c^2*sq
rt(d)*x^3 - 30*sqrt(d)*x)*a*b/c^3
```

Giac [F(-2)]

Exception generated.

$$\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int x^3\,(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
[Out] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

3.211 $\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 29, antiderivative size = 303

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\frac{b^2x\sqrt{d-c^2dx^2}}{64c^2}-\frac{1}{32}b^2x^3\sqrt{d-c^2dx^2}-\frac{b^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c^3\sqrt{1-c^2x^2}}+\frac{bx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}}-\frac{bcx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}-\frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2}+\frac{1}{4}x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}}$$

```
[Out] 1/64*b^2*x*(-c^2*d*x^2+d)^(1/2)/c^2-1/32*b^2*x^3*(-c^2*d*x^2+d)^(1/2)-1/8*x
*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+1/4*x^3*(-c^2*d*x^2+d)^(1/2)*
(a+b*arcsin(c*x))^2-1/64*b^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2
+1)^(1/2)+1/8*b*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(
1/2)-1/8*b*c*x^4*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+
1/24*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 303, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {4783, 4795, 4737, 4723, 327, 222}

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \frac{bx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} - \frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} - \frac{bcx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{1}{4}x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}} - \frac{b^2\arcsin(cx)\sqrt{d-c^2dx^2}}{64c^3\sqrt{1-c^2x^2}} + \frac{b^2x\sqrt{d-c^2dx^2}}{64c^2} - \frac{1}{32}b^2x^3\sqrt{d-c^2dx^2}$$

```
[In] Int[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (b^2*x*Sqrt[d - c^2*d*x^2])/(64*c^2) - (b^2*x^3*Sqrt[d - c^2*d*x^2])/32 - (
b^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64*c^3*Sqrt[1 - c^2*x^2]) + (b*x^2*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*c*Sqrt[1 - c^2*x^2]) - (b*c*x^4*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) - (x*Sqrt[d -
 c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(8*c^2) + (x^3*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x])^2)/4 + (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(24*b*c^3
*Sqrt[1 - c^2*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{4}x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{\sqrt{d-c^2dx^2}\int\frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}}\\
&\quad-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int x^3(a+b\arcsin(cx))\,dx}{2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{bcx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} + \frac{1}{4}x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{\sqrt{d-c^2dx^2}\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{8c^2\sqrt{1-c^2x^2}} + \frac{\left(b\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{4c\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2\sqrt{d-c^2dx^2}\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}dx}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{32}b^2x^3\sqrt{d-c^2dx^2} + \frac{bx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} - \frac{bcx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} + \frac{1}{4}x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}} + \frac{\left(3b^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}dx}{32\sqrt{1-c^2x^2}} - \frac{\left(b^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}dx}{8\sqrt{1-c^2x^2}}$$

$$= \frac{b^2x\sqrt{d-c^2dx^2}}{64c^2} - \frac{1}{32}b^2x^3\sqrt{d-c^2dx^2} + \frac{bx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} - \frac{bcx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} + \frac{1}{4}x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}} + \frac{\left(3b^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx}{64c^2\sqrt{1-c^2x^2}} - \frac{\left(b^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx}{16c^2\sqrt{1-c^2x^2}}$$

$$= \frac{b^2x\sqrt{d-c^2dx^2}}{64c^2} - \frac{1}{32}b^2x^3\sqrt{d-c^2dx^2} - \frac{b^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c^3\sqrt{1-c^2x^2}} + \frac{bx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} - \frac{bcx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} + \frac{1}{4}x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 246, normalized size of antiderivative = 0.81

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\frac{\sqrt{d-c^2dx^2}\left(8a^3+3b^3cx(1-2c^2x^2)\sqrt{1-c^2x^2}-24ab^2c^2x^2(-1+c^2x^2)+24a^2bcx\sqrt{1-c^2x^2}(-1+2c^2x^2)\right.}{}$$

[In] Integrate[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]

[Out] (Sqrt[d - c^2*d*x^2]*(8*a^3 + 3*b^3*c*x*(1 - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] - 24*a*b^2*c^2*x^2*(-1 + c^2*x^2) + 24*a^2*b*c*x*Sqrt[1 - c^2*x^2]*(-1 + 2*c^2*x^2) - 3*b*(-8*a^2 + 16*a*b*c*x*(1 - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] + b^2*(1 - 8*c^2*x^2 + 8*c^4*x^4))*ArcSin[c*x] + 24*b^2*(a + b*c*x*Sqrt[1 - c^2*x^2]*(-1 + 2*c^2*x^2))*ArcSin[c*x]^2 + 8*b^3*ArcSin[c*x]^3))/(192*b*c^3*Sqrt[1 - c^2*x^2])

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.20 (sec) , antiderivative size = 678, normalized size of antiderivative = 2.24

method	result
default	$-\frac{a^2x(-c^2dx^2+d)^{\frac{3}{2}}}{4c^2d}+\frac{a^2x\sqrt{-c^2dx^2+d}}{8c^2}+\frac{a^2d\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8c^2\sqrt{c^2d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\arcsin(cx)^3}{24c^3(c^2x^2-1)}+\right.$
parts	$-\frac{a^2x(-c^2dx^2+d)^{\frac{3}{2}}}{4c^2d}+\frac{a^2x\sqrt{-c^2dx^2+d}}{8c^2}+\frac{a^2d\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8c^2\sqrt{c^2d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\arcsin(cx)^3}{24c^3(c^2x^2-1)}+\right.$

[In] int(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)

[Out] -1/4*a^2*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/8*a^2/c^2*x*(-c^2*d*x^2+d)^(1/2)+1/8*a^2/c^2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^2*(-1/24*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3+1/512*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)/c^3/(c^2*x^2-1)+1/512*(-d*(c^2*x^2-1))^(1/2)*(8*I*(-c^2*x^2+1)^(1/2)*c^4*x^4+8*c^5*x^5-8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+4*c*x)*(-4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)/c^3/(c^2*x^2-1))+2*a*b*(-1/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2+1/256*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(4*arcsin(c*x)+I)/c^3/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1)

```
)^(1/2)*(8*I*(-c^2*x^2+1)^(1/2)*c^4*x^4+8*c^5*x^5-8*I*(-c^2*x^2+1)^(1/2)*x^
2*c^2-12*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+4*c*x)*(-I+4*arcsin(c*x))/c^3/(c^2*x^
2-1))
```

Fricas [F]

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)^2x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(-c^
2*d*x^2 + d), x)
```

Sympy [F]

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int x^2\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))^2\,dx$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)^2x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] 1/8*a^2*(sqrt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^2 + d)^(3/2)*x/(c^2*d) +
sqrt(d)*arcsin(c*x)/c^3) + sqrt(d)*integrate((b^2*x^2*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))^2 + 2*a*b*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F]

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)^2x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^2*x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int x^2\,(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
[Out] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

3.212 $\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 27, antiderivative size = 188

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\frac{4b^2\sqrt{d-c^2dx^2}}{9c^2}+\frac{2b^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{27c^2}+\frac{2bx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}}-\frac{2bcx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3c^2d}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/c^2/d+4/9*b^2*(-c^2*d*x^2+d)^
(1/2)/c^2+2/27*b^2*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+2/3*b*x*(a+b*arcsi
n(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/9*b*c*x^3*(a+b*arcsin(c
*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used

$= \{4767, 4739, 455, 45\}$

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \frac{2bx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{3c^2d} - \frac{2bcx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + \frac{2b^2(1-c^2x^2)\,\sqrt{d-c^2dx^2}}{27c^2} + \frac{4b^2\sqrt{d-c^2dx^2}}{9c^2}$$

```
[In] Int[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (4*b^2*Sqrt[d - c^2*d*x^2])/(9*c^2) + (2*b^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x
^2])/(27*c^2) + (2*b*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*c*Sqrt[1
 - c^2*x^2]) - (2*b*c*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*Sqrt[
1 - c^2*x^2]) - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*c^2*d)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{3c^2d} \\
&\quad+\frac{\left(2b\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{3c\sqrt{1-c^2x^2}} \\
&= \frac{2bx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}}-\frac{2bcx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{3c^2d}-\frac{\left(2b^2\sqrt{d-c^2dx^2}\right)\int\frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}} \\
&= \frac{2bx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}}-\frac{2bcx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{3c^2d}-\frac{\left(b^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{3\sqrt{1-c^2x^2}} \\
&= \frac{2bx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}}-\frac{2bcx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{3c^2d} \\
&\quad-\frac{\left(b^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{2}{3\sqrt{1-c^2x}}+\frac{1}{3}\sqrt{1-c^2x}\right)\,dx,x,x^2\right)}{3\sqrt{1-c^2x^2}} \\
&= \frac{4b^2\sqrt{d-c^2dx^2}}{9c^2}+\frac{2b^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{27c^2}+\frac{2bx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} \\
&\quad-\frac{2bcx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{3c^2d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 120, normalized size of antiderivative = 0.64

$$
\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx
$$

$$
=\frac{\sqrt{d-c^2dx^2}\left(\left(-1+c^2x^2\right)(a+b\arcsin(cx))^2-\frac{2b\left(b\sqrt{1-c^2x^2}\left(-7+c^2x^2\right)+3acx\left(-3+c^2x^2\right)+3bcx\left(-3+c^2x^2\right)\arcsin(cx)\right)}{9\sqrt{1-c^2x^2}}\right)}{3c^2}
$$

```
[In] Integrate[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
[Out] (Sqrt[d - c^2*d*x^2]*((-1 + c^2*x^2)*(a + b*ArcSin[c*x])^2 - (2*b*(b*Sqrt[1
 - c^2*x^2]*(-7 + c^2*x^2) + 3*a*c*x*(-3 + c^2*x^2) + 3*b*c*x*(-3 + c^2*x^2
)*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2])))/(3*c^2)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.21 (sec) , antiderivative size = 700, normalized size of antiderivative = 3.72

method	result
default	$-\frac{a^2(-c^2dx^2+d)^{\frac{3}{2}}}{3c^2d}+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\left(4c^4x^4-5c^2x^2-4i\sqrt{-c^2x^2+1}\,x^3c^3+3icx\sqrt{-c^2x^2+1}+1\right)\left(6i\arcsin(cx)+9\arcsin(cx)^2-2\right.}{216c^2(c^2x^2-1)}\right.$
parts	$-\frac{a^2(-c^2dx^2+d)^{\frac{3}{2}}}{3c^2d}+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\left(4c^4x^4-5c^2x^2-4i\sqrt{-c^2x^2+1}\,x^3c^3+3icx\sqrt{-c^2x^2+1}+1\right)\left(6i\arcsin(cx)+9\arcsin(cx)^2-2\right.}{216c^2(c^2x^2-1)}\right.$

```
[In] int(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*a^2*(-c^2*d*x^2+d)^(3/2)/c^2/d+b^2*(1/216*(-d*(c^2*x^2-1))^(1/2)*(4*c^
4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1
)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^
(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x)
)/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*
x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^2/(c^2*x^2-1)+1/216*(-d*(c^2*x^2
-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)
*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^2-1))+2*a
*b*(1/72*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+
1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))/c^2/(c^2*x^2-1)-1/
8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+
I)/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2
*x^2-1)*(arcsin(c*x)-I)/c^2/(c^2*x^2-1)+1/72*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^
3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*
(-I+3*arcsin(c*x))/c^2/(c^2*x^2-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 208, normalized size of antiderivative = 1.11

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\frac{6\left(abc^3x^3-3\,abcx+\left(b^2c^3x^3-3\,b^2cx\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+\left(\left(9\,a^2-2\,b^2\right)c^4x^4-2\left(9\,a^2-\right.\right.}{}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/27*(6*(a*b*c^3*x^3 - 3*a*b*c*x + (b^2*c^3*x^3 - 3*b^2*c*x)*arcsin(c*x))*s
qrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + ((9*a^2 - 2*b^2)*c^4*x^4 - 2*(9*a^
2 - 8*b^2)*c^2*x^2 + 9*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 +
```

```
9*a^2 - 14*b^2 + 18*(a*b*c^4*x^4 - 2*a*b*c^2*x^2 + a*b)*arcsin(c*x))*sqrt(-
c^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F]

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int x\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))^2\;dx$$

```
[In] integrate(x*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
[Out] Integral(x*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.00

$$\begin{aligned}&\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx\\&=-\frac{2}{27}\,b^2\left(\frac{\sqrt{-c^2x^2+1}d^{\frac{3}{2}}x^2-\frac{7\sqrt{-c^2x^2+1}d^{\frac{3}{2}}}{c^2}}{d}+\frac{3\left(c^2d^{\frac{3}{2}}x^3-3\,d^{\frac{3}{2}}x\right)\arcsin\left(cx\right)}{cd}\right)\\&\quad-\frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}b^2\arcsin\left(cx\right)^2}{3\,c^2d}-\frac{2\left(-c^2dx^2+d\right)^{\frac{3}{2}}ab\arcsin\left(cx\right)}{3\,c^2d}\\&\quad-\frac{2\left(c^2d^{\frac{3}{2}}x^3-3\,d^{\frac{3}{2}}x\right)ab}{9\,cd}-\frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}a^2}{3\,c^2d}\end{aligned}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -2/27*b^2*((sqrt(-c^2*x^2 + 1)*d^(3/2)*x^2 - 7*sqrt(-c^2*x^2 + 1)*d^(3/2)/c
^2)/d + 3*(c^2*d^(3/2)*x^3 - 3*d^(3/2)*x)*arcsin(c*x)/(c*d)) - 1/3*(-c^2*d*
x^2 + d)^(3/2)*b^2*arcsin(c*x)^2/(c^2*d) - 2/3*(-c^2*d*x^2 + d)^(3/2)*a*b*a
rcsin(c*x)/(c^2*d) - 2/9*(c^2*d^(3/2)*x^3 - 3*d^(3/2)*x)*a*b/(c*d) - 1/3*(-
c^2*d*x^2 + d)^(3/2)*a^2/(c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: TypeError}$$

[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int x\,(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}\,dx$$

[In] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)

[Out] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)

3.213 $\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 26, antiderivative size = 192

$$\begin{aligned}\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx &= -\frac{1}{4}b^2x\sqrt{d-c^2dx^2}+\frac{b^2\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}}\\ &\quad -\frac{bcx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}\\ &\quad +\frac{1}{2}x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\\ &\quad +\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] -1/4*b^2*x*(-c^2*d*x^2+d)^(1/2)+1/2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)
)^2+1/4*b^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/2*b*c*x
^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/6*(a+b*arcsi
n(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used

$= \{4741, 4737, 4723, 327, 222\}$

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{bcx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{b^2\arcsin(cx)\sqrt{d-c^2dx^2}}{4c\sqrt{1-c^2x^2}} - \frac{1}{4}b^2x\sqrt{d-c^2dx^2}$$

```
[In] Int[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/4*(b^2*x*Sqrt[d - c^2*d*x^2]) + (b^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(4
*c*Sqrt[1 - c^2*x^2]) - (b*c*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(
2*Sqrt[1 - c^2*x^2]) + (x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2 + (S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{2}x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{\sqrt{d-c^2dx^2}\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}\\
&\quad-\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}\\
&=-\frac{bcx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\\
&\quad+\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}+\frac{\left(b^2c^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}\\
&=-\frac{1}{4}b^2x\sqrt{d-c^2dx^2}-\frac{bcx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}\\
&\quad+\frac{1}{2}x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\\
&\quad+\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}+\frac{\left(b^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}}\\
&=-\frac{1}{4}b^2x\sqrt{d-c^2dx^2}+\frac{b^2\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}}-\frac{bcx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}\\
&\quad+\frac{1}{2}x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 128, normalized size of antiderivative = 0.67

$$\begin{aligned}
&\int\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx\\
&=\frac{1}{6}\sqrt{d-c^2dx^2}\left(3x(a+b\arcsin(cx))^2+\frac{(a+b\arcsin(cx))^3}{bc\sqrt{1-c^2x^2}}\right.\\
&\qquad\left.-\frac{3b\left(cx\left(2acx+b\sqrt{1-c^2x^2}\right)+b(-1+2c^2x^2)\arcsin(cx)\right)}{2c\sqrt{1-c^2x^2}}\right)
\end{aligned}$$

[In] Integrate[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]

[Out] (Sqrt[d - c^2*d*x^2]*(3*x*(a + b*ArcSin[c*x])^2 + (a + b*ArcSin[c*x])^3/(b*c*Sqrt[1 - c^2*x^2]) - (3*b*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*ArcSin[c*x]))/(2*c*Sqrt[1 - c^2*x^2])))/6

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.18 (sec) , antiderivative size = 531, normalized size of antiderivative = 2.77

method	result
default	$\frac{x\sqrt{-c^2dx^2+d}\,a^2}{2}+\frac{a^2d\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{2\sqrt{c^2d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{6c(c^2x^2-1)}+\frac{\sqrt{-d(c^2x^2-1)}\,\left(-2i\sqrt{-c^2x^2\right.}}{}\right.$
parts	$\frac{x\sqrt{-c^2dx^2+d}\,a^2}{2}+\frac{a^2d\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{2\sqrt{c^2d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{6c(c^2x^2-1)}+\frac{\sqrt{-d(c^2x^2-1)}\,\left(-2i\sqrt{-c^2x^2\right.}}{}\right.$

[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)

[Out] 1/2*x*(-c^2*d*x^2+d)^(1/2)*a^2+1/2*a^2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^2*(-1/6*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*(2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)/c/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)/c/(c^2*x^2-1))+2*a*b*(-1/4*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*(I+2*arcsin(c*x))/c/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))/c/(c^2*x^2-1))

Fricas [F]

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int \sqrt{-c^2dx^2+d}\left(b\arcsin\left(cx\right)+a\right)^2\,dx$$

[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")

[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)

Sympy [F]

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))^2\;dx$$

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-c^2dx^2+d}(b\arcsin\,(cx)+a)^2\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] 1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a^2 + sqrt(d)*integrat
e((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
[Out] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

3.214 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 378

$$\begin{aligned}
&\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}\,dx \\
&= -2b^2\sqrt{d-c^2dx^2} - \frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} \\
&\quad + \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{2ib\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{2ib\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{2b^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2b^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] -2*b^2*(-c^2*d*x^2+d)^(1/2)+(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2-2*a*b*
c*x*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*b^2*c*x*arcsin(c*x)*(-c^2*d*x
^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^
2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2*I*b*(a+b*arcsin(c*x))
*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/
2)-2*I*b*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+
d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^
2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2*b^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2
))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 378, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.276, Rules used = {4783, 4803, 4268, 2611, 2320, 6724, 4715, 267}

$$\begin{aligned}
&\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}\,dx\\
&=-\frac{2\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\\
&\quad+\frac{2ib\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\\
&\quad-\frac{2ib\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\\
&\quad+\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}\\
&\quad-\frac{2b^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{2b^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}\\
&\quad-\frac{2b^2cx\arcsin(cx)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-2b^2\sqrt{d-c^2dx^2}
\end{aligned}$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] -2*b^2*Sqrt[d - c^2*d*x^2] - (2*a*b*c*x*Sqrt[d - c^2*d*x^2])/Sqrt[1 - c^2*x
^2] - (2*b^2*c*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] + Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2 - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + ((2*I)*b*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2
*x^2] - ((2*I)*b*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*Ar
cSin[c*x])])/Sqrt[1 - c^2*x^2] - (2*b^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, -E^(
I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (2*b^2*Sqrt[d - c^2*d*x^2]*PolyLog[3,
E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
```

```
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{\sqrt{d-c^2dx^2}\int\frac{(a+b\arcsin(cx))^2}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(2bc\sqrt{d-c^2dx^2}\right)\int(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{\sqrt{d-c^2dx^2}\text{Subst}\left(\int(a+bx)^2\csc(x)\,dx, x, \arcsin(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2b^2c\sqrt{d-c^2dx^2}\right)\int\arcsin(cx)\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2b\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{\left(2b\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^2\sqrt{d-c^2dx^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}$$

$$= -2b^2\sqrt{d-c^2dx^2} - \frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2ib\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2ib\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2ib^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\text{PolyLog}\left(2,-e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{\left(2ib^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\text{PolyLog}\left(2,e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= -2b^2\sqrt{d-c^2dx^2} - \frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2ib\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2ib\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2b^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{\left(2b^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

$$= -2b^2\sqrt{d-c^2dx^2} - \frac{2abcx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} + \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2ib\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2ib\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2b^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2b^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 1.23 (sec) , antiderivative size = 391, normalized size of antiderivative = 1.03

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}\,dx$$
$$= a^2\sqrt{d-c^2dx^2}+a^2\sqrt{d}\log(cx)-a^2\sqrt{d}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)$$
$$+\frac{2ab\sqrt{d-c^2dx^2}\left(-cx+\sqrt{1-c^2x^2}\arcsin(cx)+\arcsin(cx)\log\left(1-e^{i\arcsin(cx)}\right)-\arcsin(cx)\log\left(1+e^{i\,\mathrm{ar}}\right.\right.}{\sqrt{1-c^2x^2}}$$
$$+\frac{b^2\sqrt{d-c^2dx^2}\left(-2\sqrt{1-c^2x^2}-2cx\arcsin(cx)+\sqrt{1-c^2x^2}\arcsin(cx)^2+\arcsin(cx)^2\log\left(1-e^{i\arcsin(cx)}\right.\right.}{}$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] a^2*Sqrt[d - c^2*d*x^2] + a^2*Sqrt[d]*Log[c*x] - a^2*Sqrt[d]*Log[d + Sqrt[d
]*Sqrt[d - c^2*d*x^2]] + (2*a*b*Sqrt[d - c^2*d*x^2]*(-(c*x) + Sqrt[1 - c^2*
x^2]*ArcSin[c*x] + ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]*Log
[1 + E^(I*ArcSin[c*x])] + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E
^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (b^2*Sqrt[d - c^2*d*x^2]*(-2*Sqrt[1
 - c^2*x^2] - 2*c*x*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 + ArcSin[
c*x]^2*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])
] + (2*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*ArcSin[c*x]*Po
lyLog[2, E^(I*ArcSin[c*x])] - 2*PolyLog[3, -E^(I*ArcSin[c*x])] + 2*PolyLog[
3, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2]
```

Maple [A] (verified)

Time = 0.21 (sec) , antiderivative size = 659, normalized size of antiderivative = 1.74

method	result
default	$-\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)\sqrt{d}\,a^2+\sqrt{-c^2d\,x^2+d}\,a^2+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\left(c^2x^2-icx\sqrt{-c^2x^2+1}-1\right)\left(\arcsin(cx)^2\right.}{2c^2x^2-2}\right.$
parts	$-\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)\sqrt{d}\,a^2+\sqrt{-c^2d\,x^2+d}\,a^2+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\left(c^2x^2-icx\sqrt{-c^2x^2+1}-1\right)\left(\arcsin(cx)^2\right.}{2c^2x^2-2}\right.$

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x,x,method=_RETURNVERBOSE)
```

```
[Out] -ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)*d^(1/2)*a^2+(-c^2*d*x^2+d)^(1/2
)*a^2+b^2*(1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*
(arcsin(c*x)^2-2+2*I*arcsin(c*x))/(c^2*x^2-1)+1/2*(-d*(c^2*x^2-1))^(1/2)*(I
*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/(c^2*x
^2-1)+(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(arcsin(c*x)^2*ln(1+I*c*x+(
-c^2*x^2+1)^(1/2))-arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*arcsin(
```

```
c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*polylog(2,I*c*x+(
-c^2*x^2+1)^(1/2))+2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2*polylog(3,I*c*x
+(-c^2*x^2+1)^(1/2)))/(c^2*x^2-1))+2*a*b*(1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x
^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/(c^2*x^2-1)+1/2*(-d*(c^2*x^2
-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/(c^2*x^2-1)
-I*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*(I*arcsin(c*x)*ln(
1+I*c*x+(-c^2*x^2+1)^(1/2))-I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-po
lylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))))
```

Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)^2}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/x, x)
```

Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}\,dx=\int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))^2}{x}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2/x,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/x, x)
```

Maxima [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)^2}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] -(sqrt(d)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - sqrt(-c
^2*d*x^2 + d))*a^2 + sqrt(d)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x
+ 1)*sqrt(-c*x + 1)/x, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x, x)
```

3.215 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^2}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 227

$$\begin{aligned}\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^2}\,dx &= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}-\frac{ic\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\\ &\quad-\frac{c\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}}\\ &\quad+\frac{2bc\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}\\ &\quad-\frac{ib^2c\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] -(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x-I*c*(a+b*arcsin(c*x))^2*(-c^2*d
*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/3*c*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(
1/2)/b/(-c^2*x^2+1)^(1/2)+2*b*c*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^
(1/2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b^2*c*polylog(2,(I*c*x+
(-c^2*x^2+1)^(1/2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.241, Rules used = {4781, 4721, 3798, 2221, 2317, 2438, 4737}

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^2}\,dx$$
$$= -\frac{c\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} - \frac{ic\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x} + \frac{2bc\sqrt{d-c^2dx^2}\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} - \frac{ib^2c\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] -((Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x) - (I*c*Sqrt[d - c^2*d*x^2]
*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2] - (c*Sqrt[d - c^2*d*x^2]*(a + b*A
rcSin[c*x])^3)/(3*b*Sqrt[1 - c^2*x^2]) + (2*b*c*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^2*c*S
qrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
```

```
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}+\frac{\left(2bc\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{x}\,dx}{\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(c^2\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}-\frac{c\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} \\
&\quad +\frac{\left(2bc\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} \\
&= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}-\frac{ic\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} \\
&\quad -\frac{c\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(4ibc\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x} - \frac{ic\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{c\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} + \frac{2bc\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2b^2c\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x} - \frac{ic\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{c\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} + \frac{2bc\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{\left(ib^2c\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x} - \frac{ic\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{c\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} + \frac{2bc\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{ib^2c\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 1.04 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.13

$$\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^2}\,dx = -\frac{a^2\sqrt{d-c^2dx^2}}{x} + a^2c\sqrt{d}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}\,(-1+c^2x^2)}\right) - \frac{ab\sqrt{d-c^2dx^2}\left(2\sqrt{1-c^2x^2}\arcsin(cx)+cx\arcsin(cx)^2-2cx\log(cx)\right)}{x\sqrt{1-c^2x^2}} - \frac{b^2c\sqrt{d-c^2dx^2}\left(\arcsin(cx)\left(\left(3i+\frac{3\sqrt{1-c^2x^2}}{cx}\right)\arcsin(cx)+\arcsin(cx)^2-6\log\left(1-e^{2i\arcsin(cx)}\right)\right)+3i\,\text{Po}\right.}{3\sqrt{1-c^2x^2}}$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] -((a^2*Sqrt[d - c^2*d*x^2])/x) + a^2*c*Sqrt[d]*ArcTan[(c*x*Sqrt[d - c^2*d*x
^2])/(Sqrt[d]*(-1 + c^2*x^2))] - (a*b*Sqrt[d - c^2*d*x^2]*(2*Sqrt[1 - c^2*x
^2]*ArcSin[c*x] + c*x*ArcSin[c*x]^2 - 2*c*x*Log[c*x]))/(x*Sqrt[1 - c^2*x^2]
) - (b^2*c*Sqrt[d - c^2*d*x^2]*(ArcSin[c*x]*((3*I + (3*Sqrt[1 - c^2*x^2])/(
c*x))*ArcSin[c*x] + ArcSin[c*x]^2 - 6*Log[1 - E^((2*I)*ArcSin[c*x])]) + (3*
I)*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(3*Sqrt[1 - c^2*x^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 564 vs. $2(225) = 450$.

Time = 0.23 (sec) , antiderivative size = 565, normalized size of antiderivative = 2.49

method	result
default	$-\frac{a^2(-c^2dx^2+d)^{\frac{3}{2}}}{dx} - a^2c^2x\sqrt{-c^2dx^2+d} - \frac{a^2c^2d\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{\sqrt{c^2d}} + b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\arcsin(cx)^3 c}{3c^2x^2-3}\right.$
parts	$-\frac{a^2(-c^2dx^2+d)^{\frac{3}{2}}}{dx} - a^2c^2x\sqrt{-c^2dx^2+d} - \frac{a^2c^2d\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{\sqrt{c^2d}} + b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\sqrt{-c^2x^2+1}\arcsin(cx)^3 c}{3c^2x^2-3}\right.$

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -a^2/d/x*(-c^2*d*x^2+d)^(3/2)-a^2*c^2*x*(-c^2*d*x^2+d)^(1/2)-a^2*c^2*d/(c^2
*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^2*(1/3*(-d*(c^2*x^
2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^3*c-(-d*(c^2*x^2-1))
^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*arcsin(c*x)^2/(c^2*x^2-1)/x+2*I
*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*(I*arcsin(c*x)*ln(1+
I*c*x+(-c^2*x^2+1)^(1/2))+I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+arcs
in(c*x)^2+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+polylog(2,I*c*x+(-c^2*x^2+1)
^(1/2)))*c)+2*a*b*(1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1
)*arcsin(c*x)^2*c+2*I*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)
*arcsin(c*x)*c-(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*
arcsin(c*x)/(c^2*x^2-1)/x-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^
2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*c)
```

Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^2}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)^2}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/x^2, x)
```

Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^2}\,dx=\int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\operatorname{asin}{(cx)})^2}{x^2}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/x**2, x)
```

Maxima [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^2}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)^2}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima
")
```

```
[Out] -(c*sqrt(d)*arcsin(c*x) + sqrt(-c^2*d*x^2 + d)/x)*a^2 + sqrt(d)*integrate((
b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x^2, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^2}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^2}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}}{x^2}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x^2,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x^2, x)
```

3.216 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^3}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 398

$$
\begin{aligned}
\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^3}\,dx
&= -\frac{bc\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2x^2} \\
&\quad + \frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{b^2c^2\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{ibc^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{ibc^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{b^2c^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{b^2c^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

```
[Out] -1/2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^2-b*c*(a+b*arcsin(c*x))*(-c
^2*d*x^2+d)^(1/2)/x/(-c^2*x^2+1)^(1/2)+c^2*(a+b*arcsin(c*x))^2*arctanh(I*c*
x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-b^2*c^2*arcta
nh((-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b*c^2*(a+b
*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c
^2*x^2+1)^(1/2)+I*b*c^2*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2
))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+b^2*c^2*polylog(3,-I*c*x-(-c^2*x
^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-b^2*c^2*polylog(3,I*c*
x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 398, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {4781, 4723, 272, 65, 214, 4803, 4268, 2611, 2320, 6724}

$$\begin{aligned}&\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^3}\,dx\\&=\frac{c^2\sqrt{d-c^2dx^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\\&-\frac{ibc^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\\&+\frac{ibc^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\\&-\frac{bc\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2x^2}\\&+\frac{b^2c^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}\\&-\frac{b^2c^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{b^2c^2\text{arctanh}\left(\sqrt{1-c^2x^2}\right)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}\end{aligned}$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] -((b*c*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[1 - c^2*x^2])) - (S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*x^2) + (c^2*Sqrt[d - c^2*d*x^2
]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^
2*c^2*Sqrt[d - c^2*d*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[1 - c^2*x^2] - (
I*b*c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x
])])/Sqrt[1 - c^2*x^2] + (I*b*c^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*P
olyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (b^2*c^2*Sqrt[d - c^2*d*x
^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^2*c^2*Sqrt[d - c
^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2x^2}+\frac{\left(bc\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{x^2}\,dx}{\sqrt{1-c^2x^2}}-\frac{\left(c^2\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{x\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}$$

$$=-\frac{bc\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2x^2}-\frac{\left(c^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^2\csc(x)\,dx,x,\arcsin(cx)\right)}{2\sqrt{1-c^2x^2}}+\frac{\left(b^2c^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}$$

$$=-\frac{bc\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2x^2}+\frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{\left(bc^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}-\frac{\left(bc^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}+\frac{\left(b^2c^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2x^2} + \frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{ibc^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{ibc^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(b^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}dx,x,\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} + \frac{\left(ib^2c^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,-e^{ix}\right)dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{\left(ib^2c^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,e^{ix}\right)dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2x^2} + \frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{b^2c^2\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} - \frac{ibc^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{ibc^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,-x)}{x}dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(b^2c^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,x)}{x}dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{bc\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2x^2} + \frac{c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{b^2c^2\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} - \frac{ibc^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{ibc^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{b^2c^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{b^2c^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 4.00 (sec) , antiderivative size = 480, normalized size of antiderivative = 1.21

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^3}\,dx = \frac{1}{8}\Bigg(-\frac{4a^2\sqrt{d-c^2dx^2}}{x^2} - 4a^2c^2\sqrt{d}\log(x) + 4a^2c^2\sqrt{d}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right) + \frac{2abc^2d\sqrt{1-c^2x^2}\left(-2\cot\left(\frac{1}{2}\arcsin(cx)\right) - \arcsin(cx)\csc^2\left(\frac{1}{2}\arcsin(cx)\right) - 4\arcsin(cx)\log\left(1-e^{i\arcsin(cx)}\right.\right.}{} + \frac{b^2c^2d\sqrt{1-c^2x^2}\left(-4\arcsin(cx)\cot\left(\frac{1}{2}\arcsin(cx)\right) - \arcsin(cx)^2\csc^2\left(\frac{1}{2}\arcsin(cx)\right) - 4\arcsin(cx)^2\log\left(1\right.\right.}{}$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] ((-4*a^2*Sqrt[d - c^2*d*x^2])/x^2 - 4*a^2*c^2*Sqrt[d]*Log[x] + 4*a^2*c^2*Sq
rt[d]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (2*a*b*c^2*d*Sqrt[1 - c^2*x^2]
*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*
Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - (4*
I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2, E^(I*ArcSin[c*x])] + A
rcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/Sqrt[d - c^2*d*x^2
] + (b^2*c^2*d*Sqrt[1 - c^2*x^2]*(-4*ArcSin[c*x]*Cot[ArcSin[c*x]/2] - ArcSi
n[c*x]^2*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]^2*Log[1 - E^(I*ArcSin[c*x])]
+ 4*ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] + 8*Log[Tan[ArcSin[c*x]/2]] -
(8*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] + (8*I)*ArcSin[c*x]*PolyLo
g[2, E^(I*ArcSin[c*x])] + 8*PolyLog[3, -E^(I*ArcSin[c*x])] - 8*PolyLog[3, E
```

```
^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Sec[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]*Tan[
ArcSin[c*x]/2]))/Sqrt[d - c^2*d*x^2])/8
```

Maple [A] (verified)

Time = 0.28 (sec) , antiderivative size = 589, normalized size of antiderivative = 1.48

method	result
default	$a^2\left(-\frac{(-c^2dx^2+d)^{\frac{3}{2}}}{2dx^2}-\frac{c^2\left(\sqrt{-c^2dx^2+d}-\sqrt{d}\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)\right)}{2}\right)+b^2\left(-\frac{\left(c^2x^2\arcsin(cx)-2cx\sqrt{-c^2x^2+1}-\text{arc}\right.}{2x^2(c^2x^2}\right.$
parts	$a^2\left(-\frac{(-c^2dx^2+d)^{\frac{3}{2}}}{2dx^2}-\frac{c^2\left(\sqrt{-c^2dx^2+d}-\sqrt{d}\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)\right)}{2}\right)+b^2\left(-\frac{\left(c^2x^2\arcsin(cx)-2cx\sqrt{-c^2x^2+1}-\text{arc}\right.}{2x^2(c^2x^2}\right.$

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/2/d/x^2*(-c^2*d*x^2+d)^(3/2)-1/2*c^2*((-c^2*d*x^2+d)^(1/2)-d^(1/2)*
ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)))+b^2*(-1/2*(c^2*x^2*arcsin(c*x)
-2*c*x*(-c^2*x^2+1)^(1/2)-arcsin(c*x))*arcsin(c*x)*(-d*(c^2*x^2-1))^(1/2)/x
^2/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(arcsin(c*x)^2
*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2)
)-2*I*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*poly
log(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2*po
lylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-4*arctanh(I*c*x+(-c^2*x^2+1)^(1/2)))*c^2/
(c^2*x^2-1))+2*a*b*(-1/2*(c^2*x^2*arcsin(c*x)-c*x*(-c^2*x^2+1)^(1/2)-arcsin
(c*x))*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)+I*(-d*(c^2*x^2-1))^(1/2)*(-c^
2*x^2+1)^(1/2)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*arcsin(c*x)*
ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+polylog(
2,-I*c*x-(-c^2*x^2+1)^(1/2)))*c^2/(2*c^2*x^2-2))
```

Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^3}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)^2}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/x^3, x)
```

Sympy [F]

$$\int \frac{\sqrt{d - c^2 d x^2} (a + b \arcsin(cx))^2}{x^3} \, dx = \int \frac{\sqrt{-d (cx - 1) (cx + 1)} (a + b \operatorname{asin}(cx))^2}{x^3} \, dx$$

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2/x**3,x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/x**3, x)
```

Maxima [F]

$$\int \frac{\sqrt{d - c^2 d x^2} (a + b \arcsin(cx))^2}{x^3} \, dx = \int \frac{\sqrt{-c^2 d x^2 + d} (b \arcsin(cx) + a)^2}{x^3} \, dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima
")
[Out] 1/2*(c^2*sqrt(d)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) -
sqrt(-c^2*d*x^2 + d)*c^2 - (-c^2*d*x^2 + d)^(3/2)/(d*x^2))*a^2 + sqrt(d)*in
tegrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x^3, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d - c^2 d x^2} (a + b \arcsin(cx))^2}{x^3} \, dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^3}\,dx=\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\sqrt{d-c^2\,d\,x^2}}{x^3}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x^3,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x^3, x)
```

3.217 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^4}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 314

$$\begin{aligned}
&\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^4}\,dx \\
&= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3\sqrt{d-c^2dx^2}\arcsin(cx)}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} \\
&\quad + \frac{ic^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3dx^3} \\
&\quad - \frac{2bc^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} \\
&\quad + \frac{ib^2c^3\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/d/x^3-1/3*b^2*c^2*(-c^2*d*x^2
+d)^(1/2)/x-1/3*b^2*c^3*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
+1/3*I*c^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/3*
b*c^3*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*d*x^2+d)^(
1/2)/(-c^2*x^2+1)^(1/2)+1/3*I*b^2*c^3*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^
2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/3*b*c*(a+b*arcsin(c*x))*(-c^2*
x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 314, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.310, Rules used = {4771, 4775, 283, 222, 4721, 3798, 2221, 2317, 2438}

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^4}\,dx$$
$$= -\frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3dx^3} + \frac{ic^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} - \frac{2bc^3\sqrt{d-c^2dx^2}\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} + \frac{ib^2c^3\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} - \frac{b^2c^3\arcsin(cx)\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{b^2c^2\sqrt{d-c^2dx^2}}{3x}$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -1/3*(b^2*c^2*Sqrt[d - c^2*d*x^2])/x - (b^2*c^3*Sqrt[d - c^2*d*x^2]*ArcSin[
c*x])/(3*Sqrt[1 - c^2*x^2]) - (b*c*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x]))/(3*x^2) + ((I/3)*c^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x])^2)/Sqrt[1 - c^2*x^2] - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(
3*d*x^3) - (2*b*c^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I
)*ArcSin[c*x])])/(3*Sqrt[1 - c^2*x^2]) + ((I/3)*b^2*c^3*Sqrt[d - c^2*d*x^2]
*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 283

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^p/(c*(m + 1))), x] - Dist[b*n*(p/(c^n*(m + 1))), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcSin[c*x
])/(f*(m + 1))), x] + (-Dist[b*c*(d^p/(f*(m + 1))), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rubi steps

$$\text{integral} = -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3dx^3} + \frac{\left(2bc\sqrt{d-c^2dx^2}\right)\int\frac{(1-c^2x^2)(a+b\arcsin(cx))}{x^3}\,dx}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3dx^3} + \frac{\left(b^2c^2\sqrt{d-c^2dx^2}\right)\int\frac{\sqrt{1-c^2x^2}}{x^2}\,dx}{3\sqrt{1-c^2x^2}} - \frac{\left(2bc^3\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{x}\,dx}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3dx^3} - \frac{\left(2bc^3\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)}{3\sqrt{1-c^2x^2}} - \frac{\left(b^2c^4\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3\sqrt{d-c^2dx^2}\arcsin(cx)}{3\sqrt{1-c^2x^2}} - \frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{ic^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3dx^3} + \frac{\left(4ibc^3\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right)}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3\sqrt{d-c^2dx^2}\arcsin(cx)}{3\sqrt{1-c^2x^2}} - \frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{ic^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3dx^3} - \frac{2bc^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^3\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3\sqrt{d-c^2dx^2}\arcsin(cx)}{3\sqrt{1-c^2x^2}} - \frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{ic^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3dx^3} - \frac{2bc^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} - \frac{\left(ib^2c^3\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{b^2c^2\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3\sqrt{d-c^2dx^2}\arcsin(cx)}{3\sqrt{1-c^2x^2}} - \frac{bc\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{ic^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3dx^3} - \frac{2bc^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} + \frac{ib^2c^3\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 1.18 (sec) , antiderivative size = 248, normalized size of antiderivative = 0.79

$$\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^4}\,dx$$

$$= \frac{\sqrt{d-c^2dx^2}\left(2b^2\left(ic^3x^3-\sqrt{1-c^2x^2}+c^2x^2\sqrt{1-c^2x^2}\right)\arcsin(cx)^2-b\arcsin(cx)\left(2bcx+3a\sqrt{1-c^2x^2}+a\right.\right.}{}$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(2*b^2*(I*c^3*x^3 - Sqrt[1 - c^2*x^2] + c^2*x^2*Sqrt[1
 - c^2*x^2])*ArcSin[c*x]^2 - b*ArcSin[c*x]*(2*b*c*x + 3*a*Sqrt[1 - c^2*x^2]
 + a*Cos[3*ArcSin[c*x]] + 4*b*c^3*x^3*Log[1 - E^((2*I)*ArcSin[c*x])]) - 2*(
a*b*c*x + b^2*c^2*x^2*Sqrt[1 - c^2*x^2] + a^2*(1 - c^2*x^2)^(3/2) + 2*a*b*c
^3*x^3*Log[c*x]) + (2*I)*b^2*c^3*x^3*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(6
*x^3*Sqrt[1 - c^2*x^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2040 vs. 2(294) = 588.

Time = 0.29 (sec) , antiderivative size = 2041, normalized size of antiderivative = 6.50

method	result	size
default	Expression too large to display	2041
parts	Expression too large to display	2041

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*a^2/d/x^3*(-c^2*d*x^2+d)^(3/2)-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4
*x^4-3*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3-2*I*b^2*(-d*(c^2*x^2-1
))^(1/2)*(-c^2*x^2+1)^(1/2)*c^3/(3*c^2*x^2-3)*arcsin(c*x)^2-2*I*b^2*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^3/(3*c^2*x^2-3)*polylog(2,-I*c*x-(-c^2
*x^2+1)^(1/2))-2*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^3/(3*c^2
*x^2-3)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-
c^2*x^2+1)^(1/2)*c^3/(3*c^2*x^2-3)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2
))+2*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^3/(3*c^2*x^2-3)*arcsin
(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*
x^4-3*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6-b^2*(-d*(c^2*x^2-1))^(1/2
)/(3*c^4*x^4-3*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+b^
2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x
)^2*c^8-3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^3/(c^2*x^2-1
)*arcsin(c*x)^2*c^6+10/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)
*x/(c^2*x^2-1)*arcsin(c*x)^2*c^4-5/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-
3*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)^2*c^2+I*b^2*(-d*(c^2*x^2-1))^(1/2)/(
3*c^4*x^4-3*c^2*x^2+1)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*c^7
-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^3/(c^2*x^2-1)*(
-c^2*x^2+1)*arcsin(c*x)*c^6-I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x
^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*c^5+1/3*I*b^2*(-d*(c
^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*arcsin(
c*x)*c^4+b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^2/(c^2*x^2-1)
*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5+I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4
-3*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5+1/3*b^2*(-d*(c^2*x^2-1
))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(
1/2)*c-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^5/(c^2*x^
2-1)*arcsin(c*x)*c^8-I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x
^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^7+2/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c
^4*x^4-3*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^6+1/3*I*b^2*(-d*(c^2*x^2-
1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x
)^2*c^3-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/(c^2*x^2
-1)*arcsin(c*x)*c^4-1/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(2*I*
arcsin(c*x)*x^3*c^3-2*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*x^3*c^3+2*(-c^2*x^
```

```
2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-c*x)/x^3/(c
^2*x^2-1)+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/x/(c^2*x^2
-1)*c^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)/x^3/(c^2*x^2
-1)*arcsin(c*x)^2-2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^
5/(c^2*x^2-1)*c^8+5/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x^
3/(c^2*x^2-1)*c^6-4/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-3*c^2*x^2+1)*x/
(c^2*x^2-1)*c^4
```

Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^4}\,dx = \int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^2}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/x^4, x)
```

Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^4}\,dx = \int \frac{\sqrt{-d(cx-1)(cx+1)}(a+b\,\mathrm{asin}(cx))^2}{x^4}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2/x**4,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/x**4, x)
```

Maxima [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^4}\,dx = \int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^2}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima
")
```

```
[Out] 1/3*((-1)^(-2*c^2*d*x^2 + 2*d)*c^2*d^(3/2)*log(-2*c^2*d + 2*d/x^2) + c^2*d^
(3/2)*log(x^2 - 1/c^2) - sqrt(c^4*d*x^4 - 2*c^2*d*x^2 + d)*d/x^2)*a*b*c/d -
 2/3*(-c^2*d*x^2 + d)^(3/2)*a*b*arcsin(c*x)/(d*x^3) + 1/3*((c^2*x^2 - 1)*sq
rt(c*x + 1)*sqrt(-c*x + 1)*sqrt(d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))^2 - sqrt(d)*x^3*integrate(2*(c^3*x^2 - c)*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1))/x^3, x))*b^2/x^3 - 1/3*(-c^2*d*x^2 + d)^(3/2)*a^2/(d*x^3)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^4}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}}{x^4}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/x^4, x)
```

3.218 $\int x^3(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 29, antiderivative size = 503

$$\begin{aligned}\int x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx &= \frac{304b^2d\sqrt{d-c^2dx^2}}{3675c^4} \\ &+ \frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}} + \frac{152b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{11025c^4} \\ &+ \frac{38b^2d(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{6125c^4} - \frac{2b^2d(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^4} \\ &+ \frac{4b^2dx\sqrt{d-c^2dx^2}\arcsin(cx)}{35c^3\sqrt{1-c^2x^2}} + \frac{2bdx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{105c\sqrt{1-c^2x^2}} \\ &- \frac{16bcdx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{175\sqrt{1-c^2x^2}} + \frac{2bc^3dx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} \\ &- \frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^4} - \frac{dx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^2} \\ &+ \frac{3}{35}dx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{7}x^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\end{aligned}$$

```
[Out] 1/7*x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2+304/3675*b^2*d*(-c^2*d*x^2
+d)^(1/2)/c^4+152/11025*b^2*d*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^4+38/6125
*b^2*d*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^4-2/343*b^2*d*(-c^2*x^2+1)^3*(
-c^2*d*x^2+d)^(1/2)/c^4-2/35*d*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4
-1/35*d*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+3/35*d*x^4*(a+b*ar
csin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+4/35*a*b*d*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c
^2*x^2+1)^(1/2)+4/35*b^2*d*x*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2
+1)^(1/2)+2/105*b*d*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+
1)^(1/2)-16/175*b*c*d*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+
1)^(1/2)+2/49*b*c^3*d*x^7*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+
1)^(1/2)
```

Rubi [A] (verified)

Time = 0.51 (sec) , antiderivative size = 503, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.483, Rules used = {4787, 4783, 4795, 4767, 4715, 267, 4723, 272, 45, 14, 4777, 12, 457, 78}

$$\int x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=-\frac{dx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^2}-\frac{16bcdx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{175\sqrt{1-c^2x^2}}+\frac{1}{7}x^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{3}{35}dx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{2bdx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{105c\sqrt{1-c^2x^2}}-\frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^4}+\frac{2bc^3dx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}}+\frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{4b^2dx\arcsin(cx)\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}-\frac{2b^2d(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^4}+\frac{38b^2d(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{6125c^4}+\frac{304b^2d\sqrt{d-c^2dx^2}}{3675c^4}+\frac{152b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{11025c^4}$$

```
[In] Int[x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (304*b^2*d*Sqrt[d - c^2*d*x^2])/(3675*c^4) + (4*a*b*d*x*Sqrt[d - c^2*d*x^2]
)/(35*c^3*Sqrt[1 - c^2*x^2]) + (152*b^2*d*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2]
)/(11025*c^4) + (38*b^2*d*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(6125*c^4) -
 (2*b^2*d*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2])/(343*c^4) + (4*b^2*d*x*Sqrt[
d - c^2*d*x^2]*ArcSin[c*x])/(35*c^3*Sqrt[1 - c^2*x^2]) + (2*b*d*x^3*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(105*c*Sqrt[1 - c^2*x^2]) - (16*b*c*d*x^5
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(175*Sqrt[1 - c^2*x^2]) + (2*b*c^
3*d*x^7*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(49*Sqrt[1 - c^2*x^2]) - (
2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(35*c^4) - (d*x^2*Sqrt[d - c
^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(35*c^2) + (3*d*x^4*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x])^2)/35 + (x^4*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
```

```
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
```

```
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
```

```
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{7}x^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{1}{7}(3d)\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx \\
&\quad -\frac{\left(2bcd\sqrt{d-c^2dx^2}\right)\int x^4(1-c^2x^2)\,(a+b\arcsin(cx))\,dx}{7\sqrt{1-c^2x^2}} \\
&= -\frac{2bcdx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}}+\frac{2bc^3dx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} \\
&\quad +\frac{3}{35}dx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{7}x^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{\left(3d\sqrt{d-c^2dx^2}\right)\int\frac{x^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{35\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(6bcd\sqrt{d-c^2dx^2}\right)\int x^4(a+b\arcsin(cx))\,dx}{35\sqrt{1-c^2x^2}} \\
&\quad +\frac{\left(2b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{x^5(7-5c^2x^2)}{35\sqrt{1-c^2x^2}}\,dx}{7\sqrt{1-c^2x^2}} \\
&= -\frac{16bcdx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{175\sqrt{1-c^2x^2}}+\frac{2bc^3dx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} \\
&\quad -\frac{dx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^2}+\frac{3}{35}dx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{7}x^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{\left(2d\sqrt{d-c^2dx^2}\right)\int\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{35c^2\sqrt{1-c^2x^2}} \\
&\quad +\frac{\left(2bd\sqrt{d-c^2dx^2}\right)\int x^2(a+b\arcsin(cx))\,dx}{35c\sqrt{1-c^2x^2}} \\
&\quad +\frac{\left(2b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{x^5(7-5c^2x^2)}{\sqrt{1-c^2x^2}}\,dx}{245\sqrt{1-c^2x^2}}+\frac{\left(6b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{x^5}{\sqrt{1-c^2x^2}}\,dx}{175\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= \frac{2bdx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{105c\sqrt{1-c^2x^2}} - \frac{16bcdx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{175\sqrt{1-c^2x^2}} + \frac{2bc^3dx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} - \frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^4} - \frac{dx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^2} + \frac{3}{35}dx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{7}x^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 - \frac{\left(2b^2d\sqrt{d-c^2dx^2}\right)\int\frac{x^3}{\sqrt{1-c^2x^2}}\,dx}{105\sqrt{1-c^2x^2}} + \frac{\left(4bd\sqrt{d-c^2dx^2}\right)\int(a+b\arcsin(cx))\,dx}{35c^3\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{x^2(7-5c^2x)}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{245\sqrt{1-c^2x^2}} + \frac{\left(3b^2c^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{x^2}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{175\sqrt{1-c^2x^2}}$$

$$= \frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}} + \frac{2bdx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{105c\sqrt{1-c^2x^2}} - \frac{16bcdx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{175\sqrt{1-c^2x^2}} + \frac{2bc^3dx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} - \frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^4} - \frac{dx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^2} + \frac{3}{35}dx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{7}x^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 - \frac{\left(b^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{x}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{105\sqrt{1-c^2x^2}} + \frac{\left(4b^2d\sqrt{d-c^2dx^2}\right)\int\arcsin(cx)\,dx}{35c^3\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{2}{c^4\sqrt{1-c^2x}}+\frac{\sqrt{1-c^2x}}{c^4}-\frac{8(1-c^2x)^{3/2}}{c^4}+\frac{5(1-c^2x)^{5/2}}{c^4}\right)dx,x,x^2\right)}{245\sqrt{1-c^2x^2}} + \frac{\left(3b^2c^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{c^4\sqrt{1-c^2x}}-\frac{2\sqrt{1-c^2x}}{c^4}+\frac{(1-c^2x)^{3/2}}{c^4}\right)dx,x,x^2\right)}{175\sqrt{1-c^2x^2}}$$

$$= -\frac{62b^2d\sqrt{d-c^2dx^2}}{1225c^4} + \frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}} + \frac{74b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{3675c^4} + \frac{38b^2d(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{6125c^4} - \frac{2b^2d(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^4} + \frac{4b^2dx\sqrt{d-c^2dx^2}\arcsin(cx)}{35c^3\sqrt{1-c^2x^2}} + \frac{2bdx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{105c\sqrt{1-c^2x^2}} - \frac{16bcdx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{175\sqrt{1-c^2x^2}} + \frac{2bc^3dx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} - \frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^4} - \frac{dx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^2} + \frac{3}{35}dx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{7}x^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 - \frac{\left(b^2d\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\left(\frac{1}{c^2\sqrt{1-c^2x}}-\frac{\sqrt{1-c^2x}}{c^2}\right)dx,x,x^2\right)}{105\sqrt{1-c^2x^2}} - \frac{\left(4b^2d\sqrt{d-c^2dx^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{35c^2\sqrt{1-c^2x^2}}$$

$$= \frac{304b^2d\sqrt{d-c^2dx^2}}{3675c^4} + \frac{4abdx\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}} + \frac{152b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{11025c^4} + \frac{38b^2d(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{6125c^4} - \frac{2b^2d(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^4} + \frac{4b^2dx\sqrt{d-c^2dx^2}\arcsin(cx)}{35c^3\sqrt{1-c^2x^2}} + \frac{2bdx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{105c\sqrt{1-c^2x^2}} - \frac{16bcdx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{175\sqrt{1-c^2x^2}} + \frac{2bc^3dx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} - \frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^4} - \frac{dx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^2} + \frac{3}{35}dx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{7}x^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2$$

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 244, normalized size of antiderivative = 0.49

$$\int x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{d\sqrt{d-c^2dx^2}\left(-11025a^2(1-c^2x^2)^{5/2}(2+5c^2x^2)+210abcx(210+35c^2x^2-168c^4x^4+7\right.}{}$$

```
[In] Integrate[x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(-11025*a^2*(1 - c^2*x^2)^(5/2)*(2 + 5*c^2*x^2) + 21
0*a*b*c*x*(210 + 35*c^2*x^2 - 168*c^4*x^4 + 75*c^6*x^6) + 2*b^2*Sqrt[1 - c^
2*x^2]*(18692 - 1679*c^2*x^2 - 2178*c^4*x^4 + 1125*c^6*x^6) + 210*b*(-105*a
*(1 - c^2*x^2)^(5/2)*(2 + 5*c^2*x^2) + b*c*x*(210 + 35*c^2*x^2 - 168*c^4*x^
4 + 75*c^6*x^6))*ArcSin[c*x] - 11025*b^2*(1 - c^2*x^2)^(5/2)*(2 + 5*c^2*x^2
)*ArcSin[c*x]^2))/(385875*c^4*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.40 (sec) , antiderivative size = 1678, normalized size of antiderivative = 3.34

method	result	size
default	Expression too large to display	1678
parts	Expression too large to display	1678

```
[In] int(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/7*x^2*(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2))+b
^2*(-1/43904*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-
c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56
*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(14*I*arcsin(c*
x)+49*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)+1/16000*(-d*(c^2*x^2-1))^(1/2)*(16
*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x
^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(10*I*arcsin(c*x)+25*arcs
in(c*x)^2-2)*d/c^4/(c^2*x^2-1)+1/1152*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c
^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*ar
csin(c*x)+9*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)
*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))*d/c
^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x
^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d/c^4/(c^2*x^2-1)+1/1152*(-d*(c^2*x
^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/
2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)+
1/16000*(-d*(c^2*x^2-1))^(1/2)*(16*I*c^5*x^5*(-c^2*x^2+1)^(1/2)+16*c^6*x^6-
20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^
2*x^2-1)*(-10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)-1/43904*(
-d*(c^2*x^2-1))^(1/2)*(64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+64*c^8*x^8-112*I*(-c
^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4
*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-14*I*arcsin(c*x)+49*arcsin(
c*x)^2-2)*d/c^4/(c^2*x^2-1))+2*a*b*(-1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*
x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2
+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+
1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d/c^4/(c^2*x^2-1)-3/128*(-d*(c^2*x^2-1))^
(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d/c^4/(c^2*x^2-1
```

```
)-3/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin
(c*x)-I)*d/c^4/(c^2*x^2-1)+1/384*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*
x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin
(c*x))*d/c^4/(c^2*x^2-1)+3/39200*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/
2)*x*c+c^2*x^2-1)*(2*I+35*arcsin(c*x))*cos(6*arcsin(c*x))*d/c^4/(c^2*x^2-1)
+1/78400*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(37*I+
35*arcsin(c*x))*sin(6*arcsin(c*x))*d/c^4/(c^2*x^2-1)-1/2400*(-d*(c^2*x^2-1)
)^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(7*I+15*arcsin(c*x))*cos(4*arc
sin(c*x))*d/c^4/(c^2*x^2-1)-1/4800*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-
c^2*x^2+1)^(1/2)-I)*(11*I+45*arcsin(c*x))*sin(4*arcsin(c*x))*d/c^4/(c^2*x^2
-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 360, normalized size of antiderivative = 0.72

$$\int x^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx =$$
$$-\frac{210\,(75\,abc^7dx^7-168\,abc^5dx^5+35\,abc^3dx^3+210\,abcdx+(75\,b^2c^7dx^7-168\,b^2c^5dx^5+35\,b^2c^3dx^3+210\,b^2c$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] -1/385875*(210*(75*a*b*c^7*d*x^7 - 168*a*b*c^5*d*x^5 + 35*a*b*c^3*d*x^3 + 2
10*a*b*c*d*x + (75*b^2*c^7*d*x^7 - 168*b^2*c^5*d*x^5 + 35*b^2*c^3*d*x^3 + 2
10*b^2*c*d*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + (1125*
(49*a^2 - 2*b^2)*c^8*d*x^8 - 9*(15925*a^2 - 734*b^2)*c^6*d*x^6 + (99225*a^2
 - 998*b^2)*c^4*d*x^4 + (11025*a^2 - 40742*b^2)*c^2*d*x^2 + 11025*(5*b^2*c^
8*d*x^8 - 13*b^2*c^6*d*x^6 + 9*b^2*c^4*d*x^4 + b^2*c^2*d*x^2 - 2*b^2*d)*arc
sin(c*x)^2 - 2*(11025*a^2 - 18692*b^2)*d + 22050*(5*a*b*c^8*d*x^8 - 13*a*b*
c^6*d*x^6 + 9*a*b*c^4*d*x^4 + a*b*c^2*d*x^2 - 2*a*b*d)*arcsin(c*x))*sqrt(-c
^2*d*x^2 + d))/(c^6*x^2 - c^4)
```

Sympy [F]

$$\int x^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \int x^{3} \left(-d \left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}} \left(a+b\operatorname{asin}\left(cx\right)\right)^{2}\,dx$$

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**3*(-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 356, normalized size of antiderivative = 0.71

$$\int x^3 \left(d-c^2 d x^2\right)^{3/2} (a+b \arcsin(cx))^2 \, dx =$$

$$-\frac{1}{35}\left(\frac{5\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}{c^2d}+\frac{2\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{c^4d}\right)b^2\arcsin\left(cx\right)^2$$
$$-\frac{2}{35}\left(\frac{5\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}{c^2d}+\frac{2\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{c^4d}\right)ab\arcsin\left(cx\right)$$
$$-\frac{1}{35}\left(\frac{5\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}{c^2d}+\frac{2\left(-c^2dx^2+d\right)^{\frac{5}{2}}}{c^4d}\right)a^2$$
$$+\frac{2}{385875}b^2\left(\frac{1125\sqrt{-c^2x^2+1}c^4d^{\frac{3}{2}}x^6-2178\sqrt{-c^2x^2+1}c^2d^{\frac{3}{2}}x^4-1679\sqrt{-c^2x^2+1}d^{\frac{3}{2}}x^2+\frac{18692\sqrt{-c^2x^2+1}d^{\frac{3}{2}}}{c^2}}{c^2}\right.$$
$$+\frac{2\left(75\,c^6d^{\frac{3}{2}}x^7-168\,c^4d^{\frac{3}{2}}x^5+35\,c^2d^{\frac{3}{2}}x^3+210\,d^{\frac{3}{2}}x\right)ab}{3675\,c^3}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] -1/35*(5*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(5/2)/(c^4
*d))*b^2*arcsin(c*x)^2 - 2/35*(5*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^2*d) + 2*(-c
^2*d*x^2 + d)^(5/2)/(c^4*d))*a*b*arcsin(c*x) - 1/35*(5*(-c^2*d*x^2 + d)^(5/
2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(5/2)/(c^4*d))*a^2 + 2/385875*b^2*((112
5*sqrt(-c^2*x^2 + 1)*c^4*d^(3/2)*x^6 - 2178*sqrt(-c^2*x^2 + 1)*c^2*d^(3/2)*
x^4 - 1679*sqrt(-c^2*x^2 + 1)*d^(3/2)*x^2 + 18692*sqrt(-c^2*x^2 + 1)*d^(3/2
)/c^2)/c^2 + 105*(75*c^6*d^(3/2)*x^7 - 168*c^4*d^(3/2)*x^5 + 35*c^2*d^(3/2)
*x^3 + 210*d^(3/2)*x)*arcsin(c*x)/c^3) + 2/3675*(75*c^6*d^(3/2)*x^7 - 168*c
^4*d^(3/2)*x^5 + 35*c^2*d^(3/2)*x^3 + 210*d^(3/2)*x)*a*b/c^3
```

Giac [F(-2)]

Exception generated.

$$\int x^3 \left(d-c^2 d x^2\right)^{3/2} (a+b \arcsin(cx))^2 \, dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x^3 (d - c^2dx^2)^{3/2} (a + b \arcsin(cx))^2 \, dx = \int x^3 (a + b \operatorname{asin}(c\,x))^2 \left(d - c^2\,d\,x^2\right)^{3/2} dx$$

```
[In] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

3.219 $\int x^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 29, antiderivative size = 421

$$\int x^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2\,dx=-\frac{7b^2dx\sqrt{d-c^2dx^2}}{1152c^2}-\frac{43b^2dx^3\sqrt{d-c^2dx^2}}{1728}+\frac{1}{108}b^2c^2dx^5\sqrt{d-c^2dx^2}+\frac{7b^2d\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c^3\sqrt{1-c^2x^2}}+\frac{bdx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}}-\frac{7bcdx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}}-\frac{dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2}+\frac{1}{8}dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{1}{6}x^3(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2+\frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}}$$

```
[Out] 1/6*x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2-7/1152*b^2*d*x*(-c^2*d*x^2
+d)^(1/2)/c^2-43/1728*b^2*d*x^3*(-c^2*d*x^2+d)^(1/2)+1/108*b^2*c^2*d*x^5*(-
c^2*d*x^2+d)^(1/2)-1/16*d*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+1/
8*d*x^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+7/1152*b^2*d*arcsin(c*x)*(
-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/16*b*d*x^2*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-7/48*b*c*d*x^4*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/18*b*c^3*d*x^6*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/48*d*(a+b*arcsin(c*x))^3*(-c^2*d*x
^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 421, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.379, Rules used = {4787, 4783, 4795, 4737, 4723, 327, 222, 14, 4777, 12, 470}

$$\begin{aligned}\int x^2\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=&\frac{bdx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}}\\&-\frac{dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2}-\frac{7bcdx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}}\\&+\frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{1}{8}dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\\&+\frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}}\\&+\frac{7b^2d\arcsin(cx)\sqrt{d-c^2dx^2}}{1152c^3\sqrt{1-c^2x^2}}-\frac{7b^2dx\sqrt{d-c^2dx^2}}{1152c^2}\\&+\frac{1}{108}b^2c^2dx^5\sqrt{d-c^2dx^2}-\frac{43b^2dx^3\sqrt{d-c^2dx^2}}{1728}\end{aligned}$$

```
[In] Int[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-7*b^2*d*x*Sqrt[d - c^2*d*x^2])/(1152*c^2) - (43*b^2*d*x^3*Sqrt[d - c^2*d*
x^2])/1728 + (b^2*c^2*d*x^5*Sqrt[d - c^2*d*x^2])/108 + (7*b^2*d*Sqrt[d - c^
2*d*x^2]*ArcSin[c*x])/(1152*c^3*Sqrt[1 - c^2*x^2]) + (b*d*x^2*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/(16*c*Sqrt[1 - c^2*x^2]) - (7*b*c*d*x^4*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(48*Sqrt[1 - c^2*x^2]) + (b*c^3*d*x^6*Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(18*Sqrt[1 - c^2*x^2]) - (d*x*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(16*c^2) + (d*x^3*Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x])^2)/8 + (x^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/6 + (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(48*b*c^3*Sqrt[1 - c^2*x
^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
```

```
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{1}{2}d\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx \\
&\quad -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int x^3\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{3\sqrt{1-c^2x^2}} \\
&= -\frac{bcdx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{12\sqrt{1-c^2x^2}}+\frac{bc^3dx^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} \\
&\quad +\frac{1}{8}dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad +\frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{\left(d\sqrt{d-c^2dx^2}\right)\int\frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int x^3(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}}+\frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{x^4\left(3-2c^2x^2\right)}{12\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{7bcdx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} + \frac{bc^3dx^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} - \frac{dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2} + \frac{1}{8}dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{\left(d\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{16c^2\sqrt{1-c^2x^2}} + \frac{\left(bd\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{8c\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{x^4(3-2c^2x^2)}{\sqrt{1-c^2x^2}}dx}{36\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}dx}{16\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{64}b^2dx^3\sqrt{d-c^2dx^2} + \frac{1}{108}b^2c^2dx^5\sqrt{d-c^2dx^2} + \frac{bdx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}} - \frac{7bcdx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} + \frac{bc^3dx^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} - \frac{dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2} + \frac{1}{8}dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}} + \frac{\left(3b^2d\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}dx}{64\sqrt{1-c^2x^2}} - \frac{\left(b^2d\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}dx}{16\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}dx}{27\sqrt{1-c^2x^2}}$$

$$= \frac{b^2dx\sqrt{d-c^2dx^2}}{128c^2} - \frac{43b^2dx^3\sqrt{d-c^2dx^2}}{1728} + \frac{1}{108}b^2c^2dx^5\sqrt{d-c^2dx^2} + \frac{bdx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}} - \frac{7bcdx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} + \frac{bc^3dx^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} - \frac{dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2} + \frac{1}{8}dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}} + \frac{\left(b^2d\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}dx}{36\sqrt{1-c^2x^2}} + \frac{\left(3b^2d\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx}{128c^2\sqrt{1-c^2x^2}} - \frac{\left(b^2d\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx}{32c^2\sqrt{1-c^2x^2}}$$

$$= -\frac{7b^2dx\sqrt{d-c^2dx^2}}{1152c^2} - \frac{43b^2dx^3\sqrt{d-c^2dx^2}}{1728} + \frac{1}{108}b^2c^2dx^5\sqrt{d-c^2dx^2} - \frac{b^2d\sqrt{d-c^2dx^2}\arcsin(cx)}{128c^3\sqrt{1-c^2x^2}} + \frac{bdx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}} - \frac{7bcdx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} + \frac{bc^3dx^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} - \frac{dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2} + \frac{1}{8}dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}} + \frac{\left(b^2d\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{72c^2\sqrt{1-c^2x^2}}$$

$$= -\frac{7b^2dx\sqrt{d-c^2dx^2}}{1152c^2} - \frac{43b^2dx^3\sqrt{d-c^2dx^2}}{1728} + \frac{1}{108}b^2c^2dx^5\sqrt{d-c^2dx^2} + \frac{7b^2d\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c^3\sqrt{1-c^2x^2}} + \frac{bdx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}} - \frac{7bcdx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} + \frac{bc^3dx^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} - \frac{dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2} + \frac{1}{8}dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{6}x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 297, normalized size of antiderivative = 0.71

$$\int x^2\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{d\sqrt{d-c^2dx^2}\left(72a^3+24ab^2c^2x^2(9-21c^2x^2+8c^4x^4)-72a^2bcx\sqrt{1-c^2x^2}(3-14c^2x^2+\right.}{}$$

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(72*a^3 + 24*a*b^2*c^2*x^2*(9 - 21*c^2*x^2 + 8*c^4*x
^4) - 72*a^2*b*c*x*Sqrt[1 - c^2*x^2]*(3 - 14*c^2*x^2 + 8*c^4*x^4) + b^3*c*x
*Sqrt[1 - c^2*x^2]*(-21 - 86*c^2*x^2 + 32*c^4*x^4) + 3*b*(72*a^2 - 48*a*b*c
*x*Sqrt[1 - c^2*x^2]*(3 - 14*c^2*x^2 + 8*c^4*x^4) + b^2*(7 + 72*c^2*x^2 - 1
68*c^4*x^4 + 64*c^6*x^6))*ArcSin[c*x] + 72*b^2*(3*a + b*c*x*Sqrt[1 - c^2*x^
2]*(-3 + 14*c^2*x^2 - 8*c^4*x^4))*ArcSin[c*x]^2 + 72*b^3*ArcSin[c*x]^3))/(3
456*b*c^3*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.29 (sec) , antiderivative size = 1320, normalized size of antiderivative = 3.14

method	result	size
default	Expression too large to display	1320
parts	Expression too large to display	1320

```
[In] int(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*a^2*x*(-c^2*d*x^2+d)^(5/2)/c^2/d+1/24*a^2/c^2*x*(-c^2*d*x^2+d)^(3/2)+1
/16*a^2/c^2*d*x*(-c^2*d*x^2+d)^(1/2)+1/16*a^2/c^2*d^2/(c^2*d)^(1/2)*arctan(
(c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^2*(-1/48*(-d*(c^2*x^2-1))^(1/2)*(-c
^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*d-1/6912*(-d*(c^2*x^2-1))^(1/
2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4
*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(
1/2)-6*c*x)*(6*I*arcsin(c*x)+18*arcsin(c*x)^2-1)*d/c^3/(c^2*x^2-1)+1/256*(-
d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+
1)^(1/2)-2*c*x)*(-2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)*d/c^3/(c^2*x^2-1)+1/27
648*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(132*I*arcs
in(c*x)+144*arcsin(c*x)^2-23)*cos(5*arcsin(c*x))*d/c^3/(c^2*x^2-1)-1/27648*
(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(84*I*arcsin(c*
x)+288*arcsin(c*x)^2-31)*sin(5*arcsin(c*x))*d/c^3/(c^2*x^2-1)-1/1024*(-d*(c
^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(4*I*arcsin(c*x)+16*a
rcsin(c*x)^2-5)*cos(3*arcsin(c*x))*d/c^3/(c^2*x^2-1)+3/1024*(-d*(c^2*x^2-1)
)^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(4*arcsin(c*x)+I)*sin(3*arcsin
(c*x))*d/c^3/(c^2*x^2-1))+2*a*b*(-1/32*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^
(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*d-1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*
(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^
5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x
)*(I+6*arcsin(c*x))*d/c^3/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c
^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(
c*x))*d/c^3/(c^2*x^2-1)+1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*
x^2+1)^(1/2)-I)*(11*I+24*arcsin(c*x))*cos(5*arcsin(c*x))*d/c^3/(c^2*x^2-1)-
1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(7*I+48*
arcsin(c*x))*sin(5*arcsin(c*x))*d/c^3/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1
/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(8*arcsin(c*x)+I)*cos(3*arcsin(c*x
))*d/c^3/(c^2*x^2-1)+3/512*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+
1)^(1/2)-I)*sin(3*arcsin(c*x))*d/c^3/(c^2*x^2-1))
```

Fricas [F]

$$\int x^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2\,dx=\int(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral(-(a^2*c^2*d*x^4 - a^2*d*x^2 + (b^2*c^2*d*x^4 - b^2*d*x^2)*arcsin(c
*x)^2 + 2*(a*b*c^2*d*x^4 - a*b*d*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F]

$$\int x^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2\,dx=\int x^2(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\,\mathrm{asin}(cx))^2\,dx$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2*(-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int x^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2\,dx=\int(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] 1/48*a^2*(2*(-c^2*d*x^2 + d)^(3/2)*x/c^2 - 8*(-c^2*d*x^2 + d)^(5/2)*x/(c^2*
d) + 3*sqrt(-c^2*d*x^2 + d)*d*x/c^2 + 3*d^(3/2)*arcsin(c*x)/c^3) + sqrt(d)*
integrate(-((b^2*c^2*d*x^4 - b^2*d*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1))^2 + 2*(a*b*c^2*d*x^4 - a*b*d*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F]

$$\int x^2\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)^2x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2*x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^2\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int x^2\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

```
[In] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

3.220 $\int x(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 27, antiderivative size = 279

$$\int x(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2\,dx=\frac{16b^2d\sqrt{d-c^2dx^2}}{75c^2}+\frac{8b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{225c^2}+\frac{2b^2d(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^2}+\frac{2bdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}-\frac{4bcdx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}}+\frac{2bc^3dx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{5c^2d}$$

```
[Out] -1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/c^2/d+16/75*b^2*d*(-c^2*d*x^2
+d)^(1/2)/c^2+8/225*b^2*d*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+2/125*b^2*d
*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^2+2/5*b*d*x*(a+b*arcsin(c*x))*(-c^2*
d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-4/15*b*c*d*x^3*(a+b*arcsin(c*x))*(-c^2*
d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2/25*b*c^3*d*x^5*(a+b*arcsin(c*x))*(-c^2*
d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 279, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}=0.222$, Rules used

= {4767, 200, 4739, 12, 1261, 712}

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\frac{2bdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{5c^2d}-\frac{4bcdx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}}+\frac{2bc^3dx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}+\frac{2b^2d(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^2}+\frac{16b^2d\sqrt{d-c^2dx^2}}{75c^2}+\frac{8b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{225c^2}$$

```
[In] Int[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (16*b^2*d*Sqrt[d - c^2*d*x^2])/(75*c^2) + (8*b^2*d*(1 - c^2*x^2)*Sqrt[d - c
^2*d*x^2])/(225*c^2) + (2*b^2*d*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(125*c
^2) + (2*b*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(5*c*Sqrt[1 - c^2*x
^2]) - (4*b*c*d*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(15*Sqrt[1 - c
^2*x^2]) + (2*b*c^3*d*x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(25*Sqrt
[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(5*c^2*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{5c^2d} + \frac{\left(2bd\sqrt{d-c^2dx^2}\right)\int (1-c^2x^2)^2(a+b\arcsin(cx))\,dx}{5c\sqrt{1-c^2x^2}} \\
&= \frac{2bdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} - \frac{4bcdx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} \\
&\quad + \frac{2bc^3dx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{5c^2d} \\
&\quad - \frac{\left(2b^2d\sqrt{d-c^2dx^2}\right)\int \frac{x(15-10c^2x^2+3c^4x^4)}{15\sqrt{1-c^2x^2}}\,dx}{5\sqrt{1-c^2x^2}} \\
&= \frac{2bdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} - \frac{4bcdx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} \\
&\quad + \frac{2bc^3dx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{5c^2d} \\
&\quad - \frac{\left(2b^2d\sqrt{d-c^2dx^2}\right)\int \frac{x(15-10c^2x^2+3c^4x^4)}{\sqrt{1-c^2x^2}}\,dx}{75\sqrt{1-c^2x^2}} \\
&= \frac{2bdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} - \frac{4bcdx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} \\
&\quad + \frac{2bc^3dx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{5c^2d} \\
&\quad - \frac{\left(b^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{15-10c^2x+3c^4x^2}{\sqrt{1-c^2x}}\,dx, x, x^2\right)}{75\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{2bdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} - \frac{4bcdx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{2bc^3dx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{5c^2d} - \frac{\left(b^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{8}{\sqrt{1-c^2x}}+4\sqrt{1-c^2x}+3(1-c^2x)^{3/2}\right)dx,x,x^2\right)}{75\sqrt{1-c^2x^2}}$$

$$= \frac{16b^2d\sqrt{d-c^2dx^2}}{75c^2} + \frac{8b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}}{225c^2} + \frac{2b^2d(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^2} + \frac{2bdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} - \frac{4bcdx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{2bc^3dx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{5c^2d}$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.57

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx = -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{5c^2d} + \frac{2bd\sqrt{d-c^2dx^2}\left(15acx(15-10c^2x^2+3c^4x^4)+b\sqrt{1-c^2x^2}(149-38c^2x^2+9c^4x^4)+15bcx(15-10c^2x^2+\right.}{1125c^2\sqrt{1-c^2x^2}}$$

```
[In] Integrate[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/5*((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c^2*d) + (2*b*d*Sqrt[d
- c^2*d*x^2]*(15*a*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + b*Sqrt[1 - c^2*x^2]*
(149 - 38*c^2*x^2 + 9*c^4*x^4) + 15*b*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4)*Arc
Sin[c*x]))/(1125*c^2*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.49 (sec) , antiderivative size = 1151, normalized size of antiderivative = 4.13

method	result	size
default	Expression too large to display	1151
parts	Expression too large to display	1151

```
[In] int(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/5*a^2*(-c^2*d*x^2+d)^(5/2)/c^2/d+b^2*(-1/4000*(-d*(c^2*x^2-1))^(1/2)*(16
*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x
^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(10*I*arcsin(c*x)+25*arcs
in(c*x)^2-2)*d/c^2/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^
2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*arc
sin(c*x)+9*arcsin(c*x)^2-2)*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(
c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))*d/c^2
/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-
1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d/c^2/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1
))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x
*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d/c^2/(c^2*x^2-1)-1/40
00*(-d*(c^2*x^2-1))^(1/2)*(16*I*c^5*x^5*(-c^2*x^2+1)^(1/2)+16*c^6*x^6-20*I*
(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2+1)^(1/2)*x*c+13*c^2*x^2
-1)*(-10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)*d/c^2/(c^2*x^2-1))+2*a*b*(-1/800
*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*
c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1
)*(I+5*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-
I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2
*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d/c^2/(
c^2*x^2-1)+1/96*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^
4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d/c^2/(c^2
*x^2-1)-1/1200*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*
(11*I+45*arcsin(c*x))*cos(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/600*(-d*(c^2*x
^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(7*I+15*arcsin(c*x))*sin(
4*arcsin(c*x))*d/c^2/(c^2*x^2-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 295, normalized size of antiderivative = 1.06

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx =$$

$$-\frac{30\left(3\,abc^5dx^5-10\,abc^3dx^3+15\,abcdx+\left(3\,b^2c^5dx^5-10\,b^2c^3dx^3+15\,b^2cdx\right)\arcsin\left(cx\right)\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2}}{}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] -1/1125*(30*(3*a*b*c^5*d*x^5 - 10*a*b*c^3*d*x^3 + 15*a*b*c*d*x + (3*b^2*c^5
*d*x^5 - 10*b^2*c^3*d*x^3 + 15*b^2*c*d*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)
*sqrt(-c^2*x^2 + 1) + (9*(25*a^2 - 2*b^2)*c^6*d*x^6 - (675*a^2 - 94*b^2)*c^
4*d*x^4 + (675*a^2 - 374*b^2)*c^2*d*x^2 + 225*(b^2*c^6*d*x^6 - 3*b^2*c^4*d*
x^4 + 3*b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 - (225*a^2 - 298*b^2)*d + 450*
(a*b*c^6*d*x^6 - 3*a*b*c^4*d*x^4 + 3*a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sq
rt(-c^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F]

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int x(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))^2\,dx$$

```
[In] integrate(x*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
[Out] Integral(x*(-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 236, normalized size of antiderivative = 0.85

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=-\frac{(-c^2dx^2+d)^{\frac{5}{2}}b^2\arcsin(cx)^2}{5c^2d}$$
$$+\frac{2}{1125}b^2\left(\frac{9\sqrt{-c^2x^2+1}c^2d^{\frac{5}{2}}x^4-38\sqrt{-c^2x^2+1}d^{\frac{5}{2}}x^2+\frac{149\sqrt{-c^2x^2+1}d^{\frac{5}{2}}}{c^2}}{d}+\frac{15\left(3c^4d^{\frac{5}{2}}x^5-10c^2d^{\frac{5}{2}}x^3+15d^{\frac{5}{2}}\right.}{cd}\right.$$
$$-\frac{2(-c^2dx^2+d)^{\frac{5}{2}}ab\arcsin(cx)}{5c^2d}-\frac{(-c^2dx^2+d)^{\frac{5}{2}}a^2}{5c^2d}+\frac{2\left(3c^4d^{\frac{5}{2}}x^5-10c^2d^{\frac{5}{2}}x^3+15d^{\frac{5}{2}}x\right)ab}{75cd}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -1/5*(-c^2*d*x^2 + d)^(5/2)*b^2*arcsin(c*x)^2/(c^2*d) + 2/1125*b^2*((9*sqrt
(-c^2*x^2 + 1)*c^2*d^(5/2)*x^4 - 38*sqrt(-c^2*x^2 + 1)*d^(5/2)*x^2 + 149*sq
rt(-c^2*x^2 + 1)*d^(5/2)/c^2)/d + 15*(3*c^4*d^(5/2)*x^5 - 10*c^2*d^(5/2)*x^
3 + 15*d^(5/2)*x)*arcsin(c*x)/(c*d)) - 2/5*(-c^2*d*x^2 + d)^(5/2)*a*b*arcsi
n(c*x)/(c^2*d) - 1/5*(-c^2*d*x^2 + d)^(5/2)*a^2/(c^2*d) + 2/75*(3*c^4*d^(5/
2)*x^5 - 10*c^2*d^(5/2)*x^3 + 15*d^(5/2)*x)*a*b/(c*d)
```

Giac [F(-2)]

Exception generated.

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int x\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

```
[In] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

3.221 $\int (d-c^2dx^2)^{3/2} (a+b\arcsin(cx))^2 \, dx$

Optimal result

Integrand size = 26, antiderivative size = 305

$$\int (d-c^2dx^2)^{3/2} (a+b\arcsin(cx))^2 \, dx = -\frac{17}{64}b^2dx\sqrt{d-c^2dx^2}+\frac{1}{32}b^2c^2dx^3\sqrt{d-c^2dx^2} + \frac{17b^2d\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}} - \frac{5bcdx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{bc^3dx^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{3}{8}dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{4}x(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 + \frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}}$$

```
[Out] 1/4*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2-17/64*b^2*d*x*(-c^2*d*x^2+d)
^(1/2)+1/32*b^2*c^2*d*x^3*(-c^2*d*x^2+d)^(1/2)+3/8*d*x*(a+b*arcsin(c*x))^2*
(-c^2*d*x^2+d)^(1/2)+17/64*b^2*d*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x
^2+1)^(1/2)-5/8*b*c*d*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+
1)^(1/2)+1/8*b*c^3*d*x^4*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1
)^(1/2)+1/8*d*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/
2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 307, normalized size of antiderivative = 1.01, number of steps used = 10, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {4743, 4741, 4737, 4723, 327, 222, 4767, 201}

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}}+\frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{3}{8}dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{bd(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c}-\frac{3bcdx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}+\frac{9b^2d\arcsin(cx)\sqrt{d-c^2dx^2}}{64c\sqrt{1-c^2x^2}}-\frac{15}{64}b^2dx\sqrt{d-c^2dx^2}-\frac{1}{32}b^2dx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}$$

```
[In] Int[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-15*b^2*d*x*Sqrt[d - c^2*d*x^2])/64 - (b^2*d*x*(1 - c^2*x^2)*Sqrt[d - c^2*
d*x^2])/32 + (9*b^2*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64*c*Sqrt[1 - c^2*x
^2]) - (3*b*c*d*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^
2*x^2]) + (b*d*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))
/(8*c) + (3*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/8 + (x*(d - c^2*
d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSi
n[c*x])^3)/(8*b*c*Sqrt[1 - c^2*x^2])
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\text{integral} = \frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{1}{4}(3d)\int\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$-\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int x(1-c^2x^2)\,(a+b\arcsin(cx))\,dx}{2\sqrt{1-c^2x^2}}$$

$$= \frac{bd(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} + \frac{3}{8}dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{\left(3d\sqrt{d-c^2dx^2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(b^2d\sqrt{d-c^2dx^2}\right)\int \left(1-c^2x^2\right)^{3/2}\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(3bcd\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{32}b^2dx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} - \frac{3bcdx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{bd(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} + \frac{3}{8}dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}} - \frac{\left(3b^2d\sqrt{d-c^2dx^2}\right)\int \sqrt{1-c^2x^2}\,dx}{32\sqrt{1-c^2x^2}} + \frac{\left(3b^2c^2d\sqrt{d-c^2dx^2}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{15}{64}b^2dx\sqrt{d-c^2dx^2} - \frac{1}{32}b^2dx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} - \frac{3bcdx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{bd(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} + \frac{3}{8}dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}} - \frac{\left(3b^2d\sqrt{d-c^2dx^2}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{64\sqrt{1-c^2x^2}} + \frac{\left(3b^2d\sqrt{d-c^2dx^2}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}}$$

$$= -\frac{15}{64}b^2dx\sqrt{d-c^2dx^2} - \frac{1}{32}b^2dx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} + \frac{9b^2d\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}} - \frac{3bcdx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{bd(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} + \frac{3}{8}dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{4}x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.67 (sec) , antiderivative size = 247, normalized size of antiderivative = 0.81

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{d\sqrt{d-c^2dx^2}\left(8a^3+8ab^2c^2x^2(-5+c^2x^2)+b^3cx\sqrt{1-c^2x^2}(-17+2c^2x^2)-8a^2bcx\sqrt{1\cdots}\right.}{}$$

```
[In] Integrate[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(8*a^3 + 8*a*b^2*c^2*x^2*(-5 + c^2*x^2) + b^3*c*x*Sq
rt[1 - c^2*x^2]*(-17 + 2*c^2*x^2) - 8*a^2*b*c*x*Sqrt[1 - c^2*x^2]*(-5 + 2*c
^2*x^2) + b*(24*a^2 + 16*a*b*c*x*(5 - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] + b^2*(1
7 - 40*c^2*x^2 + 8*c^4*x^4))*ArcSin[c*x] + 8*b^2*(3*a + b*c*x*(5 - 2*c^2*x^
2)*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 8*b^3*ArcSin[c*x]^3))/(64*b*c*Sqrt[1
- c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.23 (sec) , antiderivative size = 929, normalized size of antiderivative = 3.05

method	result
default	$\frac{x(-c^2dx^2+d)^{\frac{3}{2}}a^2}{4}+\frac{3a^2dx\sqrt{-c^2dx^2+d}}{8}+\frac{3a^2d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8\sqrt{c^2d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3d}{8c(c^2x^2-1)}-\cdots\right.$
parts	$\frac{x(-c^2dx^2+d)^{\frac{3}{2}}a^2}{4}+\frac{3a^2dx\sqrt{-c^2dx^2+d}}{8}+\frac{3a^2d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8\sqrt{c^2d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3d}{8c(c^2x^2-1)}-\cdots\right.$

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*x*(-c^2*d*x^2+d)^(3/2)*a^2+3/8*a^2*d*x*(-c^2*d*x^2+d)^(1/2)+3/8*a^2*d^2
/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^2*(-1/8*(-d*(
c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3*d-1/512*(-
d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x
^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(4*I*arcsin(c*x)
+8*arcsin(c*x)^2-1)*d/c/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*
x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-2*I*arcsin(c*x
)+2*arcsin(c*x)^2-1)*d/c/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^
2-c*x*(-c^2*x^2+1)^(1/2)-I)*(68*I*arcsin(c*x)+56*arcsin(c*x)^2-31)*cos(3*ar
csin(c*x))*d/c/(c^2*x^2-1)+3/512*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/
2)*x*c+c^2*x^2-1)*(20*I*arcsin(c*x)+24*arcsin(c*x)^2-11)*sin(3*arcsin(c*x))
*d/c/(c^2*x^2-1))+2*a*b*(-3/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/
```

```
(c^2*x^2-1)*arcsin(c*x)^2*d-1/256*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)
^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*
x^2+1)^(1/2)+4*c*x)*(4*arcsin(c*x)+I)*d/c/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))
^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x
)*(-I+2*arcsin(c*x))*d/c/(c^2*x^2-1)-1/256*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^
2-c*x*(-c^2*x^2+1)^(1/2)-I)*(17*I+28*arcsin(c*x))*cos(3*arcsin(c*x))*d/c/(c
^2*x^2-1)+3/256*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)
*(5*I+12*arcsin(c*x))*sin(3*arcsin(c*x))*d/c/(c^2*x^2-1))
```

Fricas [F]

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)^2\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F]

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int \left(-d(cx-1)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)^2\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] 1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*ar
csin(c*x)/c)*a^2 + sqrt(d)*integrate(-((b^2*c^2*d*x^2 - b^2*d)*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*x^2 - a*b*d)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: TypeError}$$

[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

[In] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)

[Out] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)

3.222 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 545

$$\begin{aligned}
\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx = & -\frac{22}{9}b^2d\sqrt{d-c^2dx^2}-\frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} \\
& -\frac{2}{27}b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}-\frac{2b^2cdx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} \\
& -\frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}+\frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
& +d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{1}{3}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 \\
& -\frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
& +\frac{2ibd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
& -\frac{2ibd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
& -\frac{2b^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
& +\frac{2b^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] 1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2-22/9*b^2*d*(-c^2*d*x^2+d)^(1/2
)-2/27*b^2*d*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)+d*(a+b*arcsin(c*x))^2*(-c^2*
d*x^2+d)^(1/2)-2*a*b*c*d*x*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*b^2*c*
```

```
d*x*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/3*b*c*d*x*(a+b*ar
csin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2/9*b*c^3*d*x^3*(a+b*arc
sin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*d*(a+b*arcsin(c*x))^2*a
rctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2*
I*b*d*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)
^(1/2)/(-c^2*x^2+1)^(1/2)-2*I*b*d*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x
^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*b^2*d*polylog(3,-I*c
*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2*b^2*d*poly
log(3,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 545, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.414$, Rules used = {4787, 4783, 4803, 4268, 2611, 2320, 6724, 4715, 267, 4739, 455, 45}

$$
\begin{aligned}
&\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx = \\
&-\frac{2d\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} \\
&+\frac{2ibd\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} \\
&-\frac{2ibd\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} \\
&-\frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}+\frac{1}{3}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 \\
&+d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&-\frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{2b^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&+\frac{2b^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{2b^2cdx\arcsin(cx)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} \\
&-\frac{22}{9}b^2d\sqrt{d-c^2dx^2}-\frac{2}{27}b^2d(1-c^2x^2)\sqrt{d-c^2dx^2}
\end{aligned}
$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (-22*b^2*d*Sqrt[d - c^2*d*x^2])/9 - (2*a*b*c*d*x*Sqrt[d - c^2*d*x^2])/Sqrt[
1 - c^2*x^2] - (2*b^2*d*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/27 - (2*b^2*c*d*
x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (2*b*c*d*x*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*x^3*Sqrt
[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + d*Sqrt[d - c^2
```

```
*d*x^2]*(a + b*ArcSin[c*x])^2 + ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^
2)/3 - (2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c
*x])])/Sqrt[1 - c^2*x^2] + ((2*I)*b*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((2*I)*b*d*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*
x^2] - (2*b^2*d*Sqrt[d - c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1
- c^2*x^2] + (2*b^2*d*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sq
rt[1 - c^2*x^2]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \frac{1}{3}\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + d\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}\,dx - \frac{\left(2bcd\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} + \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{3}\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{\left(d\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(2bcd\sqrt{d-c^2dx^2}\right)\int(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} + \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{3}\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^2\csc(x)\,dx, x, \arcsin(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2b^2cd\sqrt{d-c^2dx^2}\right)\int\arcsin(cx)\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx, x, x^2\right)}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cdx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} - \frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} + \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{3}\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 - \frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2bd\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int(a+bx)\log\left(1-e^{ix}\right)dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{\left(2bd\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int(a+bx)\log\left(1+e^{ix}\right)dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\left(\frac{2}{3\sqrt{1-c^2x}}+\frac{1}{3}\sqrt{1-c^2x}\right)dx,x,x^2\right)}{3\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{22}{9}b^2d\sqrt{d-c^2dx^2} - \frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2}{27}b^2d\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} - \frac{2b^2cdx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} - \frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} + \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{3}\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 - \frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2ibd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2ibd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2ib^2d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,-e^{ix}\right)dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{\left(2ib^2d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,e^{ix}\right)dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{22}{9}b^2d\sqrt{d-c^2dx^2} - \frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2}{27}b^2d(1-c^2x^2)\sqrt{d-c^2dx^2} - \frac{2b^2cdx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} - \frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} + \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{3}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 - \frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2ibd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2ibd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2b^2d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{\left(2b^2d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{22}{9}b^2d\sqrt{d-c^2dx^2} - \frac{2abcdx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2}{27}b^2d(1-c^2x^2)\sqrt{d-c^2dx^2} - \frac{2b^2cdx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} - \frac{2bcdx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} + \frac{2bc^3dx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{3}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 - \frac{2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2ibd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2ibd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2b^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2b^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 2.14 (sec) , antiderivative size = 576, normalized size of antiderivative = 1.06

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx = -\frac{1}{3}a^2d(-4+c^2x^2)\sqrt{d-c^2dx^2}+a^2d^{3/2}\log(cx)$$
$$-a^2d^{3/2}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)+\frac{2abd\sqrt{d-c^2dx^2}\left(-cx+\sqrt{1-c^2x^2}\arcsin(cx)+\arcsin(cx)\log\left(1-e^{i\,\mathrm{arc}}\right.\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] -1/3*(a^2*d*(-4 + c^2*x^2)*Sqrt[d - c^2*d*x^2]) + a^2*d^(3/2)*Log[c*x] - a^
2*d^(3/2)*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (2*a*b*d*Sqrt[d - c^2*d*x^
2]*(-(c*x) + Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]*Log[1 - E^(I*ArcSi
n[c*x])] - ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + I*PolyLog[2, -E^(I*ArcS
in[c*x])] - I*PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (b^2*d*Sq
rt[d - c^2*d*x^2]*(2*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x
^2]*ArcSin[c*x]^2 - ArcSin[c*x]^2*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(
I*ArcSin[c*x])]) - (2*I)*ArcSin[c*x]*(PolyLog[2, -E^(I*ArcSin[c*x])] - Poly
Log[2, E^(I*ArcSin[c*x])]) + 2*(PolyLog[3, -E^(I*ArcSin[c*x])] - PolyLog[3,
 E^(I*ArcSin[c*x])])))/Sqrt[1 - c^2*x^2] - (a*b*d*Sqrt[d - c^2*d*x^2]*(9*c*
x - 3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^2] + Cos[3*ArcSin[c*x]]) + Sin[3*ArcSin
[c*x]]))/(18*Sqrt[1 - c^2*x^2]) + (b^2*d*Sqrt[d - c^2*d*x^2]*(27*Sqrt[1 - c
^2*x^2]*(-2 + ArcSin[c*x]^2) + (-2 + 9*ArcSin[c*x]^2)*Cos[3*ArcSin[c*x]] -
6*ArcSin[c*x]*(9*c*x + Sin[3*ArcSin[c*x]])))/(108*Sqrt[1 - c^2*x^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1071 vs. 2(529) = 1058.

Time = 0.28 (sec) , antiderivative size = 1072, normalized size of antiderivative = 1.97

method	result	size
default	Expression too large to display	1072
parts	Expression too large to display	1072

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*(-c^2*d*x^2+d)^(3/2)*a^2-a^2*d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(
1/2))/x)+a^2*d*(-c^2*d*x^2+d)^(1/2)+b^2*(-1/216*(-d*(c^2*x^2-1))^(1/2)*(4*c
^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+
1)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d/(c^2*x^2-1)+5/8*(-d*(c^2*x^2-1))^(
1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))
*d/(c^2*x^2-1)+5/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2
```

```
-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d/(c^2*x^2-1)-1/216*(-d*(c^2*x^2-1))^
(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-
5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d/(c^2*x^2-1)+(-d*(c^2*x^
2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*(arcsin(c*x)^2*ln(1+I*c*x+(-c^2*
x^2+1)^(1/2))-arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*arcsin(c*x)*
polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*
x^2+1)^(1/2))+2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2*polylog(3,I*c*x+(-c^
2*x^2+1)^(1/2)))*d)+2*a*b*(-1/72*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^
2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(
c*x))*d/(c^2*x^2-1)+5/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2
)*x*c-1)*(arcsin(c*x)+I)*d/(c^2*x^2-1)+5/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*
x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d/(c^2*x^2-1)-1/72*(-d*(c^2*x^2
-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)
*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d/(c^2*x^2-1)-I*(-d*(c^2*x^2-1))^(1/2)
*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2
))-I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2*x^2+1
)^(1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)))*d)
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{x}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin{(cx)}+a)^2}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{x}\,dx=\int \frac{(-d(cx-1)\,(cx+1))^{\frac{3}{2}}\,(a+b\operatorname{asin}{(cx)})^2}{x}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/x,x)
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/x, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{x}\,dx$$

[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")

[Out] -1/3*(3*d^(3/2)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - (-c^2*d*x^2 + d)^(3/2) - 3*sqrt(-c^2*d*x^2 + d)*d)*a^2 - sqrt(d)*integrate(((b^2*c^2*d*x^2 - b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*x^2 - a*b*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x, x)

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx = \text{Exception raised: TypeError}$$

[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{3/2}}{x}\,dx$$

[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x,x)

[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x, x)

3.223 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 424

$$\begin{aligned}\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx &= \frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2} \\ &- \frac{5b^2cd\sqrt{d-c^2dx^2}\arcsin(cx)}{4\sqrt{1-c^2x^2}} + \frac{3bc^3dx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\ &+ bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\ &- \frac{3}{2}c^2dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{icd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} \\ &- \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x} - \frac{cd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{2b\sqrt{1-c^2x^2}} \\ &+ \frac{2bcd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\ &- \frac{ib^2cd\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] -(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x+1/4*b^2*c^2*d*x*(-c^2*d*x^2+d)^
(1/2)-3/2*c^2*d*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-5/4*b^2*c*d*arcs
in(c*x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/2*b*c^3*d*x^2*(a+b*arcsin
(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*c*d*(a+b*arcsin(c*x))^2*(-
c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/2*c*d*(a+b*arcsin(c*x))^3*(-c^2*d*x
^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)+2*b*c*d*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^
2*x^2+1)^(1/2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b^2*c*d*polylo
g(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+b
*c*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 424, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.448, Rules used = {4785, 4741, 4737, 4723, 327, 222, 4773, 4721, 3798, 2221, 2317, 2438, 201}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx = -\frac{3}{2}c^2dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{cd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{2b\sqrt{1-c^2x^2}} - \frac{icd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} + bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x} + \frac{2bcd\sqrt{d-c^2dx^2}\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} + \frac{3bc^3dx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{ib^2cd\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{5b^2cd\arcsin(cx)\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} + \frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2}$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (b^2*c^2*d*x*Sqrt[d - c^2*d*x^2])/4 - (5*b^2*c*d*Sqrt[d - c^2*d*x^2]*ArcSin
[c*x])/(4*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d*x^2*Sqrt[d - c^2*d*x^2]*(a + b*Ar
cSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + b*c*d*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x]) - (3*c^2*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])^2)/2 - (I*c*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^
2] - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x - (c*d*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x])^3)/(2*b*Sqrt[1 - c^2*x^2]) + (2*b*c*d*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^
2] - (I*b^2*c*d*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt
[1 - c^2*x^2]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x} - (3c^2d)\int\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx + \frac{\left(2bcd\sqrt{d-c^2dx^2}\right)\int\frac{(1-c^2x^2)(a+b\arcsin(cx))}{x}\,dx}{\sqrt{1-c^2x^2}}$$

$$= bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{3}{2}c^2dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x} + \frac{\left(2bcd\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{x}\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(3c^2d\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(3bc^3d\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{2}b^2c^2dx\sqrt{d-c^2dx^2} + \frac{3bc^3dx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{3}{2}c^2dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x} - \frac{cd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{2b\sqrt{1-c^2x^2}} + \frac{\left(2bcd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\cot(x)\,dx, x, \arcsin(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(3b^2c^4d\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}$$

$$= \frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2} - \frac{b^2cd\sqrt{d-c^2dx^2}\arcsin(cx)}{2\sqrt{1-c^2x^2}} + \frac{3bc^3dx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{3}{2}c^2dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{icd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x} - \frac{cd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{2b\sqrt{1-c^2x^2}} - \frac{\left(4ibcd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{\left(3b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}}$$

$$= \frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2} - \frac{5b^2cd\sqrt{d-c^2dx^2}\arcsin(cx)}{4\sqrt{1-c^2x^2}} + \frac{3bc^3dx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{3}{2}c^2dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{icd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x} - \frac{cd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{2b\sqrt{1-c^2x^2}} + \frac{2bcd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2b^2cd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-e^{2ix}\right)dx, x, \arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2} - \frac{5b^2cd\sqrt{d-c^2dx^2}\arcsin(cx)}{4\sqrt{1-c^2x^2}} + \frac{3bc^3dx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{3}{2}c^2dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{icd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x} - \frac{cd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{2b\sqrt{1-c^2x^2}} + \frac{2bcd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{\left(ib^2cd\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}dx, x, e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{1}{4}b^2c^2dx\sqrt{d-c^2dx^2} - \frac{5b^2cd\sqrt{d-c^2dx^2}\arcsin(cx)}{4\sqrt{1-c^2x^2}} \\
&+ \frac{3bc^3dx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&+ bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&- \frac{3}{2}c^2dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{icd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} \\
&- \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x} - \frac{cd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{2b\sqrt{1-c^2x^2}} \\
&+ \frac{2bcd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{ib^2cd\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 3.11 (sec) , antiderivative size = 396, normalized size of antiderivative = 0.93

$$
\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx = \frac{-12a^2d\sqrt{1-c^2x^2}(2+c^2x^2)\sqrt{d-c^2dx^2} + 36a^2cd^{3/2}x\sqrt{1-c^2x^2}\,\mathrm{ar}
$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (-12*a^2*d*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*Sqrt[d - c^2*d*x^2] + 36*a^2*c*d
^(3/2)*x*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 +
c^2*x^2))] - 24*a*b*d*Sqrt[d - c^2*d*x^2]*(2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]
+ c*x*ArcSin[c*x]^2 - 2*c*x*Log[c*x]) - 8*b^2*d*Sqrt[d - c^2*d*x^2]*(ArcSin
[c*x]*(3*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + c*x*ArcSin[c*x]*(3*I + ArcSin[c*x]
) - 6*c*x*Log[1 - E^((2*I)*ArcSin[c*x])]) + (3*I)*c*x*PolyLog[2, E^((2*I)*A
rcSin[c*x])]) - b^2*c*d*x*Sqrt[d - c^2*d*x^2]*(4*ArcSin[c*x]^3 + 6*ArcSin[c
*x]*Cos[2*ArcSin[c*x]] + (-3 + 6*ArcSin[c*x]^2)*Sin[2*ArcSin[c*x]]) - 6*a*b
*c*d*x*Sqrt[d - c^2*d*x^2]*(Cos[2*ArcSin[c*x]] + 2*ArcSin[c*x]*(ArcSin[c*x]
 + Sin[2*ArcSin[c*x]])))/(24*x*Sqrt[1 - c^2*x^2])
```

Maple [A] (verified)

Time = 0.27 (sec) , antiderivative size = 709, normalized size of antiderivative = 1.67

method	result
default	$-\frac{a^2(-c^2d\,x^2+d)^{\frac{5}{2}}}{dx}-a^2c^2x(-c^2d\,x^2+d)^{\frac{3}{2}}-\frac{3\sqrt{-c^2d\,x^2+d}\,a^2c^2dx}{2}-\frac{3a^2c^2d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2\sqrt{c^2d}}+b^2\Bigg(\frac{\sqrt{-d(c}}{}$
parts	$-\frac{a^2(-c^2d\,x^2+d)^{\frac{5}{2}}}{dx}-a^2c^2x(-c^2d\,x^2+d)^{\frac{3}{2}}-\frac{3\sqrt{-c^2d\,x^2+d}\,a^2c^2dx}{2}-\frac{3a^2c^2d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2\sqrt{c^2d}}+b^2\Bigg(\frac{\sqrt{-d(c}}{}$

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -a^2/d/x*(-c^2*d*x^2+d)^(5/2)-a^2*c^2*x*(-c^2*d*x^2+d)^(3/2)-3/2*(-c^2*d*x^
2+d)^(1/2)*a^2*c^2*d*x-3/2*a^2*c^2*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x
/(-c^2*d*x^2+d)^(1/2))+b^2*(1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(
c^2*x^2-1)*arcsin(c*x)^3*d*c-1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)
^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*(2*I*arcsin(c*x)+2*arc
sin(c*x)^2-1)*d*c/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)
^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-2*I*arcsin(c*x)+2*ar
csin(c*x)^2-1)*d*c/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)
*x*c+c^2*x^2-1)*arcsin(c*x)^2*d/(c^2*x^2-1)/x+2*I*(-c^2*x^2+1)^(1/2)*(-d*(c
^2*x^2-1))^(1/2)/(c^2*x^2-1)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+
I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+arcsin(c*x)^2+polylog(2,-I*c*x
-(-c^2*x^2+1)^(1/2))+polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)))*d*c)+1/4*a*b*(-d*
(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)/x*(4*(-c^2*x^2+1)^(1/2)*a
rcsin(c*x)*x^2*c^2-2*c^3*x^3+6*c*x*arcsin(c*x)^2+8*I*arcsin(c*x)*x*c-8*ln((
I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*x*c+8*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+c*x)*d
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{x^2}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas
")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^2, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx = \int \frac{(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\,\mathrm{asin}\,(cx))^2}{x^2}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/x**2, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima
")
```

```
[Out] -1/2*(3*sqrt(-c^2*d*x^2 + d)*c^2*d*x + 3*c*d^(3/2)*arcsin(c*x) + 2*(-c^2*d*
x^2 + d)^(3/2)/x)*a^2 - sqrt(d)*integrate(((b^2*c^2*d*x^2 - b^2*d)*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*x^2 - a*b*d)*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x^2, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{3/2}}{x^2}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x^2,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x^2, x)
```

3.224 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^3}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 590

$$\begin{aligned}
\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^3}\,dx &= 2b^2c^2d\sqrt{d-c^2dx^2} \\
&+ \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{3b^2c^3dx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} \\
&- \frac{bcd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} \\
&- \frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{2x^2} \\
&+ \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{b^2c^2d\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{3ibc^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&+ \frac{3ibc^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&+ \frac{3b^2c^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{3b^2c^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] -1/2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^2+2*b^2*c^2*d*(-c^2*d*x^2+d
)^(1/2)-3/2*c^2*d*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+3*a*b*c^3*d*x*(-
c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3*b^2*c^3*d*x*arcsin(c*x)*(-c^2*d*x^2
```

```
+d)^(1/2)/(-c^2*x^2+1)^(1/2)-b*c*d*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/x
/(-c^2*x^2+1)^(1/2)-b*c^3*d*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*
x^2+1)^(1/2)+3*c^2*d*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*
(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-b^2*c^2*d*arctanh((-c^2*x^2+1)^(1/2
))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-3*I*b*c^2*d*(a+b*arcsin(c*x))*po
lylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+
3*I*b*c^2*d*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x
^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3*b^2*c^2*d*polylog(3,-I*c*x-(-c^2*x^2+1)^(1
/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-3*b^2*c^2*d*polylog(3,I*c*x+(-
c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 590, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.517$, Rules used = {4785, 4783, 4803, 4268, 2611, 2320, 6724, 4715, 267, 14, 4777, 457, 81, 65, 214}

$$\begin{aligned}
\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{x^3}\,dx &= \frac{3c^2d\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\\
&-\frac{3ibc^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\\
&+\frac{3ibc^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\\
&-\frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{bcd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}}\\
&-\frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{2x^2}-\frac{bc^3dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\\
&+\frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\frac{3b^2c^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}\\
&-\frac{3b^2c^2d\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{3b^2c^3dx\arcsin(cx)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}\\
&-\frac{b^2c^2d\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+2b^2c^2d\sqrt{d-c^2dx^2}
\end{aligned}$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] 2*b^2*c^2*d*Sqrt[d - c^2*d*x^2] + (3*a*b*c^3*d*x*Sqrt[d - c^2*d*x^2])/Sqrt[
1 - c^2*x^2] + (3*b^2*c^3*d*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2
*x^2] - (b*c*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[1 - c^2*x^2
]) - (b*c^3*d*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2]
- (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2 - ((d - c^2*d*x^2)^
(3/2)*(a + b*ArcSin[c*x])^2)/(2*x^2) + (3*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*
```

```
ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^2*c^2*d*S
qrt[d - c^2*d*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[1 - c^2*x^2] - ((3*I)*b
*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x]
)])/Sqrt[1 - c^2*x^2] + ((3*I)*b*c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (3*b^2*c^2*d*Sqrt[d
- c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (3*b^2*c^2
*d*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 81

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[b*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/(d*f*(n + p +
 2))), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
```

```
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{2x^2}-\frac{1}{2}(3c^2d)\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}\,dx \\
&\quad+\frac{\left(bcd\sqrt{d-c^2dx^2}\right)\int\frac{(1-c^2x^2)(a+b\arcsin(cx))}{x^2}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{bcd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}}-\frac{bc^3dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} \\
&\quad-\frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{2x^2} \\
&\quad-\frac{\left(3c^2d\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{x\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}-\frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{-1-c^2x^2}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(3bc^3d\sqrt{d-c^2dx^2}\right)\int(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} - \frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{2x^2} - \frac{\left(3c^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^2\csc(x)\,dx,x,\arcsin(cx)\right)}{2\sqrt{1-c^2x^2}} - \frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{-1-c^2x}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2\sqrt{1-c^2x^2}} + \frac{\left(3b^2c^3d\sqrt{d-c^2dx^2}\right)\int\arcsin(cx)\,dx}{\sqrt{1-c^2x^2}}$$

$$= -b^2c^2d\sqrt{d-c^2dx^2} + \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{3b^2c^3dx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} - \frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{2x^2} + \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{\left(3bc^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{\left(3bc^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2\sqrt{1-c^2x^2}} - \frac{\left(3b^2c^4d\sqrt{d-c^2dx^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= 2b^2c^2d\sqrt{d-c^2dx^2} + \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{3b^2c^3dx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{2x^2} \\
&\quad + \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{3ibc^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{3ibc^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(b^2d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(3ib^2c^2d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(3ib^2c^2d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= 2b^2c^2d\sqrt{d-c^2dx^2} + \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{3b^2c^3dx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{2x^2} \\
&\quad + \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{b^2c^2d\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{3ibc^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{3ibc^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(3b^2c^2d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(3b^2c^2d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= 2b^2c^2d\sqrt{d-c^2dx^2} + \frac{3abc^3dx\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{3b^2c^3dx\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} \\
&- \frac{bcd\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3dx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} \\
&- \frac{3}{2}c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{2x^2} \\
&+ \frac{3c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{b^2c^2d\sqrt{d-c^2dx^2}\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{3ibc^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&+ \frac{3ibc^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&+ \frac{3b^2c^2d\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{3b^2c^2d\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 7.19 (sec) , antiderivative size = 854, normalized size of antiderivative = 1.45

$$
\begin{aligned}
&\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{x^3}\,dx = \left(-a^2c^2d - \frac{a^2d}{2x^2}\right)\sqrt{-d\left(-1+c^2x^2\right)} \\
&- \frac{3}{2}a^2c^2d^{3/2}\log(x) \\
&+ \frac{3}{2}a^2c^2d^{3/2}\log\left(d+\sqrt{d}\sqrt{-d\left(-1+c^2x^2\right)}\right) - 2abc^2d\sqrt{d\left(1-c^2x^2\right)}\left(-\frac{cx}{\sqrt{1-c^2x^2}} + \arcsin(cx) + \frac{\arcsin(cx)\left(\mathrm{l}\right.}{}\right.
\end{aligned}
$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (-(a^2*c^2*d) - (a^2*d)/(2*x^2))*Sqrt[-(d*(-1 + c^2*x^2))] - (3*a^2*c^2*d^(
3/2)*Log[x])/2 + (3*a^2*c^2*d^(3/2)*Log[d + Sqrt[d]*Sqrt[-(d*(-1 + c^2*x^2)
)]])/2 - 2*a*b*c^2*d*Sqrt[d*(1 - c^2*x^2)]*(-((c*x)/Sqrt[1 - c^2*x^2]) + Ar
cSin[c*x] + (ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[
c*x])]))/Sqrt[1 - c^2*x^2] + (I*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2
, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2]) - b^2*c^2*d*Sqrt[d*(1 - c^2*x^2)]
*(-2 - (2*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] + ArcSin[c*x]^2 + (ArcSin[c*x]
^2*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*
x^2] + ((2*I)*ArcSin[c*x]*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I
*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (2*(-PolyLog[3, -E^(I*ArcSin[c*x])] +
```

```
PolyLog[3, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2]) + (a*b*c^2*d^2*Sqrt[1 -
c^2*x^2]*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 - 4*ArcS
in[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x]
)] - (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2, E^(I*ArcSin[c*
x])] + ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/(4*Sqrt[d*
(1 - c^2*x^2)]) + (b^2*c^2*d^2*Sqrt[1 - c^2*x^2]*(-4*ArcSin[c*x]*Cot[ArcSin
[c*x]/2] - ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*x]^2*Log[1 - E^(
I*ArcSin[c*x])] + 4*ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] + 8*Log[Tan[Ar
cSin[c*x]/2]] - (8*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] + (8*I)*Ar
cSin[c*x]*PolyLog[2, E^(I*ArcSin[c*x])] + 8*PolyLog[3, -E^(I*ArcSin[c*x])]
- 8*PolyLog[3, E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Sec[ArcSin[c*x]/2]^2 - 4*
ArcSin[c*x]*Tan[ArcSin[c*x]/2]))/(8*Sqrt[d*(1 - c^2*x^2)])
```

Maple [A] (verified)

Time = 0.29 (sec) , antiderivative size = 884, normalized size of antiderivative = 1.50

method	result
default	$a^{2}\left(-\frac{\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{2 d\,x^{2}}-\frac{3 c^{2}\left(\frac{\left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}{3}+d\left(\sqrt{-c^{2} d\,x^{2}+d}-\sqrt{d}\,\ln\left(\frac{2 d+2 \sqrt{d}\,\sqrt{-c^{2} d\,x^{2}+d}}{x}\right)\right)\right)}{2}\right)+b^{2}\left(-\frac{\sqrt{-d\left(c^{2} x^{2}-1\right)}\,\left(\right.}{}\right.$
parts	$a^{2}\left(-\frac{\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}}}{2 d\,x^{2}}-\frac{3 c^{2}\left(\frac{\left(-c^{2} d\,x^{2}+d\right)^{\frac{3}{2}}}{3}+d\left(\sqrt{-c^{2} d\,x^{2}+d}-\sqrt{d}\,\ln\left(\frac{2 d+2 \sqrt{d}\,\sqrt{-c^{2} d\,x^{2}+d}}{x}\right)\right)\right)}{2}\right)+b^{2}\left(-\frac{\sqrt{-d\left(c^{2} x^{2}-1\right)}\,\left(\right.}{}\right.$

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/2/d/x^2*(-c^2*d*x^2+d)^(5/2)-3/2*c^2*(1/3*(-c^2*d*x^2+d)^(3/2)+d*((
-c^2*d*x^2+d)^(1/2)-d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x))))+b
^2*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsi
n(c*x)^2-2+2*I*arcsin(c*x))*c^2*d/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I
*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*c^2*d/
(c^2*x^2-1)-1/2*d*(c^2*x^2*arcsin(c*x)-2*c*x*(-c^2*x^2+1)^(1/2)-arcsin(c*x)
)*arcsin(c*x)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/x^2-1/2*(-d*(c^2*x^2-1))^(
1/2)*(-c^2*x^2+1)^(1/2)*(3*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-3*a
rcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-6*I*arcsin(c*x)*polylog(2,-I*c*
x-(-c^2*x^2+1)^(1/2))+6*I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-4
*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))+6*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-6
*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2)))*c^2*d/(c^2*x^2-1))+2*a*b*(-1/2*(-d*(c
^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*c^2*d
/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1
)*(arcsin(c*x)-I)*c^2*d/(c^2*x^2-1)-1/2*d*(c^2*x^2*arcsin(c*x)-c*x*(-c^2*x^
```

```
2+1)^(1/2)-arcsin(c*x))*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)+3*I*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1
/2))-I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2*x^2
+1)^(1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)))*c^2*d/(2*c^2*x^2-2))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^3}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas
")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^3, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^3}\,dx = \int \frac{(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))^2}{x^3}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/x**3, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^3}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima
")
```

```
[Out] 1/2*(3*c^2*d^(3/2)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))
- (-c^2*d*x^2 + d)^(3/2)*c^2 - 3*sqrt(-c^2*d*x^2 + d)*c^2*d - (-c^2*d*x^2 +
 d)^(5/2)/(d*x^2))*a^2 - sqrt(d)*integrate(((b^2*c^2*d*x^2 - b^2*d)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*x^2 - a*b*d)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x^3, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{x^3}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{x^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{3/2}}{x^3}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x^3, x)
```

3.225 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^4}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 400

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^4}\,dx = -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3d\sqrt{d-c^2dx^2}\arcsin(cx)}{3\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x} + \frac{4ic^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x^3} + \frac{c^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} - \frac{8bc^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} + \frac{4ib^2c^3d\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}}$$

```
[Out] -1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^3-1/3*b^2*c^2*d*(-c^2*d*x^2
+d)^(1/2)/x+c^2*d*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/x-1/3*b^2*c^3*d*
arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+4/3*I*c^3*d*(a+b*arcsin
(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/3*c^3*d*(a+b*arcsin(c*x)
)^3*(-c^2*d*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2)-8/3*b*c^3*d*(a+b*arcsin(c*x))
*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
+4/3*I*b^2*c^3*d*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*d*x^2+d)^(1/
2)/(-c^2*x^2+1)^(1/2)-1/3*b*c*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)*(-c^2*
d*x^2+d)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 400, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.379$, Rules used = {4785, 4781, 4721, 3798, 2221, 2317, 2438, 4737, 4775, 283, 222}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^4}\,dx = \frac{c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x} - \frac{bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x^3} + \frac{c^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} + \frac{4ic^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} - \frac{8bc^3d\sqrt{d-c^2dx^2}\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} + \frac{4ib^2c^3d\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} - \frac{b^2c^3d\arcsin(cx)\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} - \frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x}$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] -1/3*(b^2*c^2*d*Sqrt[d - c^2*d*x^2])/x - (b^2*c^3*d*Sqrt[d - c^2*d*x^2]*Arc
Sin[c*x])/(3*Sqrt[1 - c^2*x^2]) - (b*c*d*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x]))/(3*x^2) + (c^2*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin
[c*x])^2)/x + (((4*I)/3)*c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/S
qrt[1 - c^2*x^2] - ((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*x^3) +
(c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*Sqrt[1 - c^2*x^2]) -
 (8*b*c^3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin
[c*x])])/(3*Sqrt[1 - c^2*x^2]) + (((4*I)/3)*b^2*c^3*d*Sqrt[d - c^2*d*x^2]*P
olyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 283

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^p/(c*(m + 1))), x] - Dist[b*n*(p/(c^n*(m + 1))), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcSin[c*x
])/(f*(m + 1))), x] + (-Dist[b*c*(d^p/(f*(m + 1))), Int[(f*x)^(m + 1)*(1 -
c^2*x^2)^(p - 1/2), x], x] - Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x^3} - (c^2d)\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x^2}\,dx \\
&\quad + \frac{\left(2bcd\sqrt{d-c^2dx^2}\right)\int \frac{(1-c^2x^2)(a+b\arcsin(cx))}{x^3}\,dx}{3\sqrt{1-c^2x^2}} \\
&= -\frac{bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} \\
&\quad + \frac{c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x^3} \\
&\quad + \frac{\left(b^2c^2d\sqrt{d-c^2dx^2}\right)\int \frac{\sqrt{1-c^2x^2}}{x^2}\,dx}{3\sqrt{1-c^2x^2}} - \frac{\left(2bc^3d\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{x}\,dx}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2bc^3d\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{x}\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(c^4d\sqrt{d-c^2dx^2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x^3} + \frac{c^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} - \frac{\left(2bc^3d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)}{3\sqrt{1-c^2x^2}} - \frac{\left(2bc^3d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{\left(b^2c^4d\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3d\sqrt{d-c^2dx^2}\arcsin(cx)}{3\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x} + \frac{4ic^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x^3} + \frac{c^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} + \frac{\left(4ibc^3d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right)}{3\sqrt{1-c^2x^2}} + \frac{\left(4ibc^3d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3d\sqrt{d-c^2dx^2}\arcsin(cx)}{3\sqrt{1-c^2x^2}} - \frac{bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x} + \frac{4ic^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x^3} + \frac{c^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} - \frac{8bc^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^3d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^3d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3d\sqrt{d-c^2dx^2}\arcsin(cx)}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} \\
&\quad + \frac{c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x} + \frac{4ic^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{3x^3} + \frac{c^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} \\
&\quad - \frac{8bc^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(ib^2c^3d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(ib^2c^3d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{b^2c^2d\sqrt{d-c^2dx^2}}{3x} - \frac{b^2c^3d\sqrt{d-c^2dx^2}\arcsin(cx)}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcd\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} \\
&\quad + \frac{c^2d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x} + \frac{4ic^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{3x^3} + \frac{c^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} \\
&\quad - \frac{8bc^3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} \\
&\quad + \frac{4ib^2c^3d\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.71 (sec) , antiderivative size = 493, normalized size of antiderivative = 1.23

$$
\int\frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{x^4}\,dx = \frac{-abcdx\sqrt{d-c^2dx^2} - a^2d\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2} + 4a^2c^2dx^2\sqrt{1-c
$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (-(a*b*c*d*x*Sqrt[d - c^2*d*x^2]) - a^2*d*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*
x^2] + 4*a^2*c^2*d*x^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] - b^2*c^2*d*x^
2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] + b*d*Sqrt[d - c^2*d*x^2]*(3*a*c^3*
```

```
x^3 + b*((4*I)*c^3*x^3 - Sqrt[1 - c^2*x^2] + 4*c^2*x^2*Sqrt[1 - c^2*x^2]))*
ArcSin[c*x]^2 + b^2*c^3*d*x^3*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^3 - 3*a^2*c^3
*d^(3/2)*x^3*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-
1 + c^2*x^2))] - b*d*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*(b*c*x + 2*a*(1 - 4*c^
2*x^2)*Sqrt[1 - c^2*x^2] + 8*b*c^3*x^3*Log[1 - E^((2*I)*ArcSin[c*x])]) - 8*
a*b*c^3*d*x^3*Sqrt[d - c^2*d*x^2]*Log[c*x] + (4*I)*b^2*c^3*d*x^3*Sqrt[d - c
^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(3*x^3*Sqrt[1 - c^2*x^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2249 vs. $2(372) = 744$.

Time = 0.33 (sec) , antiderivative size = 2250, normalized size of antiderivative = 5.62

method	result	size
default	Expression too large to display	2250
parts	Expression too large to display	2250

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*a^2/d/x^3*(-c^2*d*x^2+d)^(5/2)+2/3*a^2*c^4*x*(-c^2*d*x^2+d)^(3/2)-8*I*
b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^4/(c^2*x^2-1)*(-c^2
*x^2+1)^(1/2)*c^7+20/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2
+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^6+8*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*
x^4-9*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5+1/3*b^2
*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/x^2/(c^2*x^2-1)*arcsin(c
*x)*(-c^2*x^2+1)^(1/2)*c+2/3*a^2*c^2/d/x*(-c^2*d*x^2+d)^(5/2)+a^2*c^4*d*x*(
-c^2*d*x^2+d)^(1/2)+a^2*c^4*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*
d*x^2+d)^(1/2))+32*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*
x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*c^7-16/3*I*b^2*(-d*(c^2*x^
2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*arcsin(
c*x)*c^6-12*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^2/(c^
2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*c^5+4/3*I*b^2*(-d*(c^2*x^2-1))^(1
/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*arcsin(c*x)*c^4-1
/3*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^3*
c^3*d-20/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^5/(c^2*x
^2-1)*c^8+29/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^3/(c
^2*x^2-1)*c^6-10/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x/
(c^2*x^2-1)*c^4+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/x
/(c^2*x^2-1)*c^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/
x^3/(c^2*x^2-1)*arcsin(c*x)^2+8*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/
2)*c^3*d/(3*c^2*x^2-3)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+8*b^2*(-d
*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^3*d/(3*c^2*x^2-3)*arcsin(c*x)*ln(1
-I*c*x-(-c^2*x^2+1)^(1/2))-52*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^
```

```
2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)^2*c^6+73/3*b^2*(-d*(c^2*x^2-1))^(1/2)*
d/(24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)^2*c^4-14/3*b^2*(-d*(c^
2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)^2*c^2-
1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/(c^2*x^2-1)*(-c
^2*x^2+1)^(1/2)*c^3-8*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^3*d
/(3*c^2*x^2-3)*arcsin(c*x)^2-8*I*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1
/2)*c^3*d/(3*c^2*x^2-3)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-8*I*b^2*(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*c^3*d/(3*c^2*x^2-3)*polylog(2,I*c*x+(-c
^2*x^2+1)^(1/2))+3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*
x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5-4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(
24*c^4*x^4-9*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*c^4+4/3*I*b^2*(-d*(c^2*x^
2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsi
n(c*x)^2*c^3-16/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x
^5/(c^2*x^2-1)*arcsin(c*x)*c^8+4/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4
-9*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6-3*b^2*(-d*(c^2*x^2-1))^(1/2)
*d/(24*c^4*x^4-9*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+
32*b^2*(-d*(c^2*x^2-1))^(1/2)*d/(24*c^4*x^4-9*c^2*x^2+1)*x^5/(c^2*x^2-1)*ar
csin(c*x)^2*c^8-1/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/x^3/(c^2*
x^2-1)*(3*c^3*x^3*arcsin(c*x)^2+8*I*arcsin(c*x)*x^3*c^3-8*ln((I*c*x+(-c^2*x
^2+1)^(1/2))^2-1)*x^3*c^3+8*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*arcsin
(c*x)*(-c^2*x^2+1)^(1/2)-c*x)*d
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{x^4}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin{(cx)}+a)^2}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas
")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^4, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{x^4}\,dx=\int \frac{(-d(cx-1)\,(cx+1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))^2}{x^4}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/x**4,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/x**4, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^4}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima
")
```

```
[Out] 1/3*(3*sqrt(-c^2*d*x^2 + d)*c^4*d*x + 3*c^3*d^(3/2)*arcsin(c*x) + 2*(-c^2*d
*x^2 + d)^(3/2)*c^2/x - (-c^2*d*x^2 + d)^(5/2)/(d*x^3))*a^2 - sqrt(d)*integ
rate(((b^2*c^2*d*x^2 - b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
+ 2*(a*b*c^2*d*x^2 - a*b*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqr
t(c*x + 1)*sqrt(-c*x + 1)/x^4, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^4}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{3/2}}{x^4}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/x^4, x)
```

3.226 $\int x^3(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 29, antiderivative size = 651

$$\begin{aligned}\int x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx&=\frac{160b^2d^2\sqrt{d-c^2dx^2}}{3969c^4}\\&+\frac{4abd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}+\frac{80b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{11907c^4}\\&+\frac{4b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1323c^4}+\frac{50b^2d^2(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{27783c^4}\\&-\frac{2b^2d^2(1-c^2x^2)^4\sqrt{d-c^2dx^2}}{729c^4}+\frac{4b^2d^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{63c^3\sqrt{1-c^2x^2}}\\&+\frac{2bd^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{189c\sqrt{1-c^2x^2}}-\frac{2bcd^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{21\sqrt{1-c^2x^2}}\\&+\frac{38bc^3d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{441\sqrt{1-c^2x^2}}\\&-\frac{2bc^5d^2x^9\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{81\sqrt{1-c^2x^2}}-\frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{63c^4}\\&-\frac{d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{63c^2}+\frac{1}{21}d^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\\&+\frac{5}{63}dx^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{1}{9}x^4\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\end{aligned}$$

```
[Out] 5/63*d*x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2+1/9*x^4*(-c^2*d*x^2+d)^
(5/2)*(a+b*arcsin(c*x))^2+160/3969*b^2*d^2*(-c^2*d*x^2+d)^(1/2)/c^4+80/1190
7*b^2*d^2*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^4+4/1323*b^2*d^2*(-c^2*x^2+1)
^2*(-c^2*d*x^2+d)^(1/2)/c^4+50/27783*b^2*d^2*(-c^2*x^2+1)^3*(-c^2*d*x^2+d)^
(1/2)/c^4-2/729*b^2*d^2*(-c^2*x^2+1)^4*(-c^2*d*x^2+d)^(1/2)/c^4-2/63*d^2*(a
+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4-1/63*d^2*x^2*(a+b*arcsin(c*x))^2
```

```
*(-c^2*d*x^2+d)^(1/2)/c^2+1/21*d^2*x^4*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(
1/2)+4/63*a*b*d^2*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+4/63*b^2*d^
2*x*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+2/189*b*d^2*x^3
*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/21*b*c*d^2*x
^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+38/441*b*c^3*d
^2*x^7*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/81*b*c^5
*d^2*x^9*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.79 (sec) , antiderivative size = 651, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.621$, Rules used = {4787, 4783, 4795, 4767, 4715, 267, 4723, 272, 45, 14, 4777, 12, 457, 78, 276, 1265, 911, 1167}

$$\int x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=-\frac{d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{63c^2}-\frac{2bcd^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{21\sqrt{1-c^2x^2}}+\frac{1}{21}d^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{2bd^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{189c\sqrt{1-c^2x^2}}+\frac{1}{9}x^4\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2+\frac{5}{63}dx^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2-\frac{2bc^5d^2x^9\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{81\sqrt{1-c^2x^2}}-\frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcs}{63c^4}$$

```
[In] Int[x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (160*b^2*d^2*Sqrt[d - c^2*d*x^2])/(3969*c^4) + (4*a*b*d^2*x*Sqrt[d - c^2*d*
x^2])/(63*c^3*Sqrt[1 - c^2*x^2]) + (80*b^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d
*x^2])/(11907*c^4) + (4*b^2*d^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/(1323*
c^4) + (50*b^2*d^2*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2])/(27783*c^4) - (2*b^
2*d^2*(1 - c^2*x^2)^4*Sqrt[d - c^2*d*x^2])/(729*c^4) + (4*b^2*d^2*x*Sqrt[d
- c^2*d*x^2]*ArcSin[c*x])/(63*c^3*Sqrt[1 - c^2*x^2]) + (2*b*d^2*x^3*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(189*c*Sqrt[1 - c^2*x^2]) - (2*b*c*d^2*x^
5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(21*Sqrt[1 - c^2*x^2]) + (38*b*c
^3*d^2*x^7*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(441*Sqrt[1 - c^2*x^2])
 - (2*b*c^5*d^2*x^9*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(81*Sqrt[1 - c
^2*x^2]) - (2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(63*c^4) - (d^
2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(63*c^2) + (d^2*x^4*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/21 + (5*d*x^4*(d - c^2*d*x^2)^(3/2)*(a
 + b*ArcSin[c*x])^2)/63 + (x^4*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)
/9
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
```

```
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
```

```
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{9}x^4\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 \\
&\quad+\frac{1}{9}(5d)\int x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx \\
&\quad-\frac{\left(2bcd^2\sqrt{d-c^2dx^2}\right)\int x^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))\,dx}{9\sqrt{1-c^2x^2}} \\
&= -\frac{2bcd^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45\sqrt{1-c^2x^2}}+\frac{4bc^3d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{63\sqrt{1-c^2x^2}} \\
&\quad-\frac{2bc^5d^2x^9\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{81\sqrt{1-c^2x^2}} \\
&\quad+\frac{5}{63}dx^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{1}{9}x^4\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 \\
&\quad+\frac{1}{21}\left(5d^2\right)\int x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx \\
&\quad-\frac{\left(10bcd^2\sqrt{d-c^2dx^2}\right)\int x^4\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{63\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(2b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^5\left(63-90c^2x^2+35c^4x^4\right)}{315\sqrt{1-c^2x^2}}\,dx}{9\sqrt{1-c^2x^2}} \\
&= -\frac{8bcd^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{105\sqrt{1-c^2x^2}}+\frac{38bc^3d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{441\sqrt{1-c^2x^2}} \\
&\quad-\frac{2bc^5d^2x^9\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{81\sqrt{1-c^2x^2}}+\frac{1}{21}d^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad+\frac{5}{63}dx^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{1}{9}x^4\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 \\
&\quad+\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{21\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(2bcd^2\sqrt{d-c^2dx^2}\right)\int x^4(a+b\arcsin(cx))\,dx}{21\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(2b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^5\left(63-90c^2x^2+35c^4x^4\right)}{\sqrt{1-c^2x^2}}\,dx}{2835\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(10b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^5\left(7-5c^2x^2\right)}{35\sqrt{1-c^2x^2}}\,dx}{63\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{2bcd^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{21\sqrt{1-c^2x^2}} + \frac{38bc^3d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{441\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^9\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{81\sqrt{1-c^2x^2}} - \frac{d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{63c^2} + \frac{1}{21}d^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{63}dx^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{9}x^4\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 + \frac{\left(2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{63c^2\sqrt{1-c^2x^2}} + \frac{\left(2bd^2\sqrt{d-c^2dx^2}\right)\int x^2(a+b\arcsin(cx))dx}{63c\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{x^2(63-90c^2x+35c^4x^2)}{\sqrt{1-c^2x}}dx,x,x^2\right)}{2835\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^5(7-5c^2x^2)}{\sqrt{1-c^2x^2}}dx}{441\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^5}{\sqrt{1-c^2x^2}}dx}{105\sqrt{1-c^2x^2}}$$

$$= \frac{2bd^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{189c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{21\sqrt{1-c^2x^2}} + \frac{38bc^3d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{441\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^9\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{81\sqrt{1-c^2x^2}} - \frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{63c^4} - \frac{d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{63c^2} + \frac{1}{21}d^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{63}dx^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{9}x^4\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 - \frac{\left(2b^2d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{c^2}-\frac{x^2}{c^2}\right)^2(8+20x^2+35x^4)\,dx,x,\sqrt{1-c^2x^2}\right)}{2835\sqrt{1-c^2x^2}} - \frac{\left(2b^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^3}{\sqrt{1-c^2x^2}}dx}{189\sqrt{1-c^2x^2}} + \frac{\left(4bd^2\sqrt{d-c^2dx^2}\right)\int(a+b\arcsin(cx))dx}{63c^3\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{x^2(7-5c^2x)}{\sqrt{1-c^2x}}dx,x,x^2\right)}{441\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{x^2}{\sqrt{1-c^2x}}dx,x,x^2\right)}{105\sqrt{1-c^2x^2}}$$

$$= \frac{4abd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}} + \frac{2bd^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{189c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{21\sqrt{1-c^2x^2}} + \frac{38bc^3d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{441\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^9\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{81\sqrt{1-c^2x^2}} - \frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{63c^4} - \frac{d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{63c^2} + \frac{1}{21}d^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{63}dx^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{9}x^4\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 - \frac{\left(2b^2d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{8}{c^4}+\frac{4x^2}{c^4}+\frac{3x^4}{c^4}-\frac{50x^6}{c^4}+\frac{35x^8}{c^4}\right)dx, x, \sqrt{1-c^2x^2}\right)}{2835\sqrt{1-c^2x^2}} - \frac{\left(b^2d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{x}{\sqrt{1-c^2x}}dx, x, x^2\right)}{189\sqrt{1-c^2x^2}} + \frac{\left(4b^2d^2\sqrt{d-c^2dx^2}\right)\int\arcsin(cx)\,dx}{63c^3\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{2}{c^4\sqrt{1-c^2x}}+\frac{\sqrt{1-c^2x}}{c^4}-\frac{8\left(1-c^2x\right)^{3/2}}{c^4}+\frac{5\left(1-c^2x\right)^{5/2}}{c^4}\right)dx, x, x^2\right)}{441\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{c^4\sqrt{1-c^2x}}-\frac{2\sqrt{1-c^2x}}{c^4}+\frac{\left(1-c^2x\right)^{3/2}}{c^4}\right)dx, x, x^2\right)}{105\sqrt{1-c^2x^2}}$$

$$= -\frac{134b^2d^2\sqrt{d-c^2dx^2}}{3969c^4} + \frac{4abd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}} + \frac{122b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{11907c^4} + \frac{4b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1323c^4} + \frac{50b^2d^2(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{27783c^4} - \frac{2b^2d^2(1-c^2x^2)^4\sqrt{d-c^2dx^2}}{729c^4} + \frac{4b^2d^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{63c^3\sqrt{1-c^2x^2}} + \frac{2bd^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{189c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{21\sqrt{1-c^2x^2}} + \frac{38bc^3d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{441\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^9\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{81\sqrt{1-c^2x^2}} - \frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{63c^4} - \frac{d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{63c^2} + \frac{1}{21}d^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{63}dx^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{9}x^4\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 - \frac{\left(b^2d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{c^2\sqrt{1-c^2x}}-\frac{\sqrt{1-c^2x}}{c^2}\right)dx,x,x^2\right)}{189\sqrt{1-c^2x^2}} - \frac{\left(4b^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}dx}{63c^2\sqrt{1-c^2x^2}}$$

$$= \frac{160b^2d^2\sqrt{d-c^2dx^2}}{3969c^4} + \frac{4abd^2x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}} + \frac{80b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{11907c^4} + \frac{4b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1323c^4} + \frac{50b^2d^2(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{27783c^4} - \frac{2b^2d^2(1-c^2x^2)^4\sqrt{d-c^2dx^2}}{729c^4} + \frac{4b^2d^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{63c^3\sqrt{1-c^2x^2}} + \frac{2bd^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{189c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{21\sqrt{1-c^2x^2}} + \frac{38bc^3d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{441\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^9\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{81\sqrt{1-c^2x^2}} - \frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{63c^4} - \frac{d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{63c^2} + \frac{1}{21}d^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{63}dx^4\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{9}x^4\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 270, normalized size of antiderivative = 0.41

$$\int x^3(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2\,dx =$$

$$-\frac{d^2\sqrt{d-c^2dx^2}\Big(3969a^2(1-c^2x^2)^{7/2}(2+7c^2x^2)+126abcx(-126-21c^2x^2+189c^4x^4-171c^6x^6+49c^8x^8)}{}$$

```
[In] Integrate[x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/250047*(d^2*Sqrt[d - c^2*d*x^2]*(3969*a^2*(1 - c^2*x^2)^(7/2)*(2 + 7*c^2
*x^2) + 126*a*b*c*x*(-126 - 21*c^2*x^2 + 189*c^4*x^4 - 171*c^6*x^6 + 49*c^8
*x^8) + 2*b^2*Sqrt[1 - c^2*x^2]*(-6140 + 899*c^2*x^2 + 1005*c^4*x^4 - 1147*
c^6*x^6 + 343*c^8*x^8) + 126*b*(63*a*(1 - c^2*x^2)^(7/2)*(2 + 7*c^2*x^2) +
b*c*x*(-126 - 21*c^2*x^2 + 189*c^4*x^4 - 171*c^6*x^6 + 49*c^8*x^8))*ArcSin[
c*x] + 3969*b^2*(1 - c^2*x^2)^(7/2)*(2 + 7*c^2*x^2)*ArcSin[c*x]^2))/(c^4*Sq
rt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.42 (sec) , antiderivative size = 2146, normalized size of antiderivative = 3.30

method	result	size
default	Expression too large to display	2146
parts	Expression too large to display	2146

```
[In] int(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/9*x^2*(-c^2*d*x^2+d)^(7/2)/c^2/d-2/63/d/c^4*(-c^2*d*x^2+d)^(7/2))+b
^2*(1/373248*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8*x^8-256*I*(-c^2*
x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-280*c^4*x
^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2*x^2+1)^(1/2)*x^3
*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(18*I*arcsin(c*x)+81*arcsin(c*x)^2-2)*d^
2/c^4/(c^2*x^2-1)-3/175616*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-6
4*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5
-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(
14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^4/(c^2*x^2-1)+1/1728*(-d*(c^2*x^
2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x
^2+1)^(1/2)*x*c+1)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d^2/c^4/(c^2*x^2-1)-
3/256*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c
*x)^2-2+2*I*arcsin(c*x))*d^2/c^4/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(
I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d^2/c
```

```
^4/(c^2*x^2-1)+1/1728*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2
)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arc
sin(c*x)^2-2)*d^2/c^4/(c^2*x^2-1)-3/175616*(-d*(c^2*x^2-1))^(1/2)*(64*I*c^7
*x^7*(-c^2*x^2+1)^(1/2)+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6
*x^6+56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c
-25*c^2*x^2+1)*(-14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^4/(c^2*x^2-1)+1
/373248*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+256*c^10*x
^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*x^8+432*I*(-c^2*x^2+1)^(1/2)*x
^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-280*c^4*x^4+9*I*(-c^2*x
^2+1)^(1/2)*x*c+41*c^2*x^2-1)*(-18*I*arcsin(c*x)+81*arcsin(c*x)^2-2)*d^2/c^
4/(c^2*x^2-1))+2*a*b*(1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8
*x^8-256*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*
x^7*c^7-280*c^4*x^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2
*x^2+1)^(1/2)*x^3*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+9*arcsin(c*x))*d^2/c
^4/(c^2*x^2-1)-3/25088*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*
c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*
c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*
arcsin(c*x))*d^2/c^4/(c^2*x^2-1)+1/576*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*
c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*a
rcsin(c*x))*d^2/c^4/(c^2*x^2-1)-3/256*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c
^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d^2/c^4/(c^2*x^2-1)-3/256*(-d*(c^2*x
^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d^2/c^4/(
c^2*x^2-1)+1/576*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c
^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d^2/c^4/(
c^2*x^2-1)-3/25088*(-d*(c^2*x^2-1))^(1/2)*(64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+
64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56*I*(-c^2*x^2+1)^(
1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2*x^2+1)*(-I+7*arc
sin(c*x))*d^2/c^4/(c^2*x^2-1)+1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*I*(-c^2*x
^2+1)^(1/2)*x^9*c^9+256*c^10*x^10-576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7-704*c^8*
x^8+432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+688*c^6*x^6-120*I*(-c^2*x^2+1)^(1/2)*x
^3*c^3-280*c^4*x^4+9*I*(-c^2*x^2+1)^(1/2)*x*c+41*c^2*x^2-1)*(-I+9*arcsin(c*
x))*d^2/c^4/(c^2*x^2-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 486, normalized size of antiderivative = 0.75

$$\int x^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \frac{126\,(49\,abc^9d^2x^9 - 171\,abc^7d^2x^7 + 189\,abc^5d^2x^5 - 21\,abc^3d^2x^3 - 126\,abcd^2x + (49\,b^2c^9d^2}{}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] 1/250047*(126*(49*a*b*c^9*d^2*x^9 - 171*a*b*c^7*d^2*x^7 + 189*a*b*c^5*d^2*x
^5 - 21*a*b*c^3*d^2*x^3 - 126*a*b*c*d^2*x + (49*b^2*c^9*d^2*x^9 - 171*b^2*c
^7*d^2*x^7 + 189*b^2*c^5*d^2*x^5 - 21*b^2*c^3*d^2*x^3 - 126*b^2*c*d^2*x)*ar
csin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + (343*(81*a^2 - 2*b^2)*
c^10*d^2*x^10 - 2*(51597*a^2 - 1490*b^2)*c^8*d^2*x^8 + 2*(67473*a^2 - 2152*
b^2)*c^6*d^2*x^6 - 4*(15876*a^2 - 53*b^2)*c^4*d^2*x^4 - (3969*a^2 - 14078*b
^2)*c^2*d^2*x^2 + 2*(3969*a^2 - 6140*b^2)*d^2 + 3969*(7*b^2*c^10*d^2*x^10 -
 26*b^2*c^8*d^2*x^8 + 34*b^2*c^6*d^2*x^6 - 16*b^2*c^4*d^2*x^4 - b^2*c^2*d^2
*x^2 + 2*b^2*d^2)*arcsin(c*x)^2 + 7938*(7*a*b*c^10*d^2*x^10 - 26*a*b*c^8*d^
2*x^8 + 34*a*b*c^6*d^2*x^6 - 16*a*b*c^4*d^2*x^4 - a*b*c^2*d^2*x^2 + 2*a*b*d
^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^6*x^2 - c^4)
```

Sympy [F(-1)]

Timed out.

$$\int x^3 \left(d-c^2 d x^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx=\text{Timed out}$$

```
[In] integrate(x**3*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 401, normalized size of antiderivative = 0.62

$$\int x^3 \left(d-c^2 d x^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx=$$
$$-\frac{1}{63}\left(\frac{7\left(-c^2dx^2+d\right)^{\frac{7}{2}}x^2}{c^2d}+\frac{2\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{c^4d}\right)b^2\arcsin\left(cx\right)^2$$
$$-\frac{2}{63}\left(\frac{7\left(-c^2dx^2+d\right)^{\frac{7}{2}}x^2}{c^2d}+\frac{2\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{c^4d}\right)ab\arcsin\left(cx\right)$$
$$-\frac{1}{63}\left(\frac{7\left(-c^2dx^2+d\right)^{\frac{7}{2}}x^2}{c^2d}+\frac{2\left(-c^2dx^2+d\right)^{\frac{7}{2}}}{c^4d}\right)a^2$$
$$-\frac{2}{250047}b^2\left(\frac{343\sqrt{-c^2x^2+1}c^6d^{\frac{5}{2}}x^8-1147\sqrt{-c^2x^2+1}c^4d^{\frac{5}{2}}x^6+1005\sqrt{-c^2x^2+1}c^2d^{\frac{5}{2}}x^4+899\sqrt{-c^2x^2+\cdots}}{c^2}\right.$$
$$-\frac{2\left(49\,c^8d^{\frac{5}{2}}x^9-171\,c^6d^{\frac{5}{2}}x^7+189\,c^4d^{\frac{5}{2}}x^5-21\,c^2d^{\frac{5}{2}}x^3-126\,d^{\frac{5}{2}}x\right)ab}{3969\,c^3}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] -1/63*(7*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(7/2)/(c^4
*d))*b^2*arcsin(c*x)^2 - 2/63*(7*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^2*d) + 2*(-c
^2*d*x^2 + d)^(7/2)/(c^4*d))*a*b*arcsin(c*x) - 1/63*(7*(-c^2*d*x^2 + d)^(7/
2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(7/2)/(c^4*d))*a^2 - 2/250047*b^2*((343
*sqrt(-c^2*x^2 + 1)*c^6*d^(5/2)*x^8 - 1147*sqrt(-c^2*x^2 + 1)*c^4*d^(5/2)*x
^6 + 1005*sqrt(-c^2*x^2 + 1)*c^2*d^(5/2)*x^4 + 899*sqrt(-c^2*x^2 + 1)*d^(5/
2)*x^2 - 6140*sqrt(-c^2*x^2 + 1)*d^(5/2)/c^2)/c^2 + 63*(49*c^8*d^(5/2)*x^9
- 171*c^6*d^(5/2)*x^7 + 189*c^4*d^(5/2)*x^5 - 21*c^2*d^(5/2)*x^3 - 126*d^(5
/2)*x)*arcsin(c*x)/c^3) - 2/3969*(49*c^8*d^(5/2)*x^9 - 171*c^6*d^(5/2)*x^7
+ 189*c^4*d^(5/2)*x^5 - 21*c^2*d^(5/2)*x^3 - 126*d^(5/2)*x)*a*b/c^3
```

Giac [F(-2)]

Exception generated.

$$\int x^3 \left(d - c^2 d x^2\right)^{5/2} (a + b \arcsin(cx))^2 \, dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x^3 \left(d - c^2 d x^2\right)^{5/2} (a + b \arcsin(cx))^2 \, dx = \int x^3 \left(a + b \operatorname{asin}(c x)\right)^2 \left(d - c^2 d x^2\right)^{5/2} \, dx$$

```
[In] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(x^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

3.227 $\int x^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 29, antiderivative size = 556

$$\int x^2\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=-\frac{359b^2d^2x\sqrt{d-c^2dx^2}}{36864c^2}-\frac{1079b^2d^2x^3\sqrt{d-c^2dx^2}}{55296}+\frac{209b^2c^2d^2x^5\sqrt{d-c^2dx^2}}{13824}-\frac{1}{256}b^2c^4d^2x^7\sqrt{d-c^2dx^2}+\frac{359b^2d^2\sqrt{d-c^2dx^2}\arcsin(cx)}{36864c^3\sqrt{1-c^2x^2}}+\frac{5bd^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c\sqrt{1-c^2x^2}}-\frac{59bcd^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{384\sqrt{1-c^2x^2}}+\frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{144\sqrt{1-c^2x^2}}-\frac{bc^5d^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}}-\frac{5d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{128c^2}+\frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2+\frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{384bc^3\sqrt{1-c^2x^2}}$$

```
[Out] 5/48*d*x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2+1/8*x^3*(-c^2*d*x^2+d)^
(5/2)*(a+b*arcsin(c*x))^2-359/36864*b^2*d^2*x*(-c^2*d*x^2+d)^(1/2)/c^2-1079
/55296*b^2*d^2*x^3*(-c^2*d*x^2+d)^(1/2)+209/13824*b^2*c^2*d^2*x^5*(-c^2*d*x
^2+d)^(1/2)-1/256*b^2*c^4*d^2*x^7*(-c^2*d*x^2+d)^(1/2)-5/128*d^2*x*(a+b*arc
sin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+5/64*d^2*x^3*(a+b*arcsin(c*x))^2*(-c^2
*d*x^2+d)^(1/2)+359/36864*b^2*d^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^
2*x^2+1)^(1/2)+5/128*b*d^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c
^2*x^2+1)^(1/2)-59/384*b*c*d^2*x^4*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)+17/144*b*c^3*d^2*x^6*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/
```

```
2)/(-c^2*x^2+1)^(1/2)-1/32*b*c^5*d^2*x^8*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(
1/2)/(-c^2*x^2+1)^(1/2)+5/384*d^2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/
b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.67 (sec) , antiderivative size = 556, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.483$, Rules used = {4787, 4783, 4795, 4737, 4723, 327, 222, 14, 4777, 12, 470, 272, 45, 1281}

$$\int x^2\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\frac{5bd^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c\sqrt{1-c^2x^2}}$$
$$-\frac{5d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{128c^2}-\frac{59bcd^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{384\sqrt{1-c^2x^2}}$$
$$+\frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2$$
$$+\frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2-\frac{bc^5d^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}}+\frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin}{384bc^3\sqrt{1-c^2x^2}}$$

```
[In] Int[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-359*b^2*d^2*x*Sqrt[d - c^2*d*x^2])/(36864*c^2) - (1079*b^2*d^2*x^3*Sqrt[d
 - c^2*d*x^2])/55296 + (209*b^2*c^2*d^2*x^5*Sqrt[d - c^2*d*x^2])/13824 - (b
^2*c^4*d^2*x^7*Sqrt[d - c^2*d*x^2])/256 + (359*b^2*d^2*Sqrt[d - c^2*d*x^2]*
ArcSin[c*x])/(36864*c^3*Sqrt[1 - c^2*x^2]) + (5*b*d^2*x^2*Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x]))/(128*c*Sqrt[1 - c^2*x^2]) - (59*b*c*d^2*x^4*Sqrt[d
- c^2*d*x^2]*(a + b*ArcSin[c*x]))/(384*Sqrt[1 - c^2*x^2]) + (17*b*c^3*d^2*x
^6*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(144*Sqrt[1 - c^2*x^2]) - (b*c^
5*d^2*x^8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(32*Sqrt[1 - c^2*x^2]) -
 (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(128*c^2) + (5*d^2*x^3
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/64 + (5*d*x^3*(d - c^2*d*x^2)^(
3/2)*(a + b*ArcSin[c*x])^2)/48 + (x^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c
*x])^2)/8 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(384*b*c^3*Sq
rt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
```

```
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 + \frac{1}{8}(5d)\int x^2\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int x^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}} + \frac{bc^3d^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{12\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}} + \frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 + \frac{1}{16}\left(5d^2\right)\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx - \frac{\left(5bcd^2\sqrt{d-c^2dx^2}\right)\int x^3\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{24\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int \frac{x^4\left(6-8c^2x^2+3c^4x^4\right)}{24\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}}$$

$$= -\frac{11bcd^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{96\sqrt{1-c^2x^2}} + \frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{144\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}} + \frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 + \frac{\left(5d^2\sqrt{d-c^2dx^2}\right)\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{64\sqrt{1-c^2x^2}} - \frac{\left(5bcd^2\sqrt{d-c^2dx^2}\right)\int x^3(a+b\arcsin(cx))\,dx}{32\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int \frac{x^4\left(6-8c^2x^2+3c^4x^4\right)}{\sqrt{1-c^2x^2}}\,dx}{96\sqrt{1-c^2x^2}} + \frac{\left(5b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int \frac{x^4\left(3-2c^2x^2\right)}{12\sqrt{1-c^2x^2}}\,dx}{24\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{1}{256}b^2c^4d^2x^7\sqrt{d-c^2dx^2} - \frac{59bcd^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{384\sqrt{1-c^2x^2}} \\
&\quad + \frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{144\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}} \\
&\quad - \frac{5d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{128c^2} + \frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{\left(b^2d^2\sqrt{d-c^2dx^2}\right)\int \frac{x^4(-48c^2+43c^4x^2)}{\sqrt{1-c^2x^2}}\,dx}{768\sqrt{1-c^2x^2}} + \frac{\left(5d^2\sqrt{d-c^2dx^2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{128c^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(5bd^2\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{64c\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(5b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int \frac{x^4(3-2c^2x^2)}{\sqrt{1-c^2x^2}}\,dx}{288\sqrt{1-c^2x^2}} + \frac{\left(5b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int \frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{128\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{5}{512}b^2d^2x^3\sqrt{d-c^2dx^2} + \frac{209b^2c^2d^2x^5\sqrt{d-c^2dx^2}}{13824} \\
&\quad - \frac{1}{256}b^2c^4d^2x^7\sqrt{d-c^2dx^2} + \frac{5bd^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c\sqrt{1-c^2x^2}} \\
&\quad - \frac{59bcd^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{384\sqrt{1-c^2x^2}} + \frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{144\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^5d^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}} - \frac{5d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{128c^2} \\
&\quad + \frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 + \frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{384bc^3\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(15b^2d^2\sqrt{d-c^2dx^2}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{512\sqrt{1-c^2x^2}} - \frac{\left(5b^2d^2\sqrt{d-c^2dx^2}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{128\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(73b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int \frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{4608\sqrt{1-c^2x^2}} + \frac{\left(5b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int \frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{216\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{5b^2d^2x\sqrt{d-c^2dx^2}}{1024c^2} - \frac{1079b^2d^2x^3\sqrt{d-c^2dx^2}}{55296} + \frac{209b^2c^2d^2x^5\sqrt{d-c^2dx^2}}{13824} - \frac{1}{256}b^2c^4d^2x^7\sqrt{d-c^2dx^2} + \frac{5bd^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c\sqrt{1-c^2x^2}} - \frac{59bcd^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{384\sqrt{1-c^2x^2}} + \frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{144\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}} - \frac{5d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{128c^2} + \frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 + \frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{384bc^3\sqrt{1-c^2x^2}} + \frac{\left(73b^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{6144\sqrt{1-c^2x^2}} + \frac{\left(5b^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{288\sqrt{1-c^2x^2}} + \frac{\left(15b^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{1024c^2\sqrt{1-c^2x^2}} - \frac{\left(5b^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{256c^2\sqrt{1-c^2x^2}}$$

$$= -\frac{359b^2d^2x\sqrt{d-c^2dx^2}}{36864c^2} - \frac{1079b^2d^2x^3\sqrt{d-c^2dx^2}}{55296} + \frac{209b^2c^2d^2x^5\sqrt{d-c^2dx^2}}{13824} - \frac{1}{256}b^2c^4d^2x^7\sqrt{d-c^2dx^2} - \frac{5b^2d^2\sqrt{d-c^2dx^2}\arcsin(cx)}{1024c^3\sqrt{1-c^2x^2}} + \frac{5bd^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c\sqrt{1-c^2x^2}} - \frac{59bcd^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{384\sqrt{1-c^2x^2}} + \frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{144\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}} - \frac{5d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{128c^2} + \frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 + \frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{384bc^3\sqrt{1-c^2x^2}} + \frac{\left(73b^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{12288c^2\sqrt{1-c^2x^2}} + \frac{\left(5b^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{576c^2\sqrt{1-c^2x^2}}$$

$$= -\frac{359b^2d^2x\sqrt{d-c^2dx^2}}{36864c^2} - \frac{1079b^2d^2x^3\sqrt{d-c^2dx^2}}{55296} + \frac{209b^2c^2d^2x^5\sqrt{d-c^2dx^2}}{13824} - \frac{1}{256}b^2c^4d^2x^7\sqrt{d-c^2dx^2} + \frac{359b^2d^2\sqrt{d-c^2dx^2}\arcsin(cx)}{36864c^3\sqrt{1-c^2x^2}} + \frac{5bd^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c\sqrt{1-c^2x^2}} - \frac{59bcd^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{384\sqrt{1-c^2x^2}} + \frac{17bc^3d^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{144\sqrt{1-c^2x^2}} - \frac{bc^5d^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}} - \frac{5d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{128c^2} + \frac{5}{64}d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{48}dx^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{8}x^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 + \frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{384bc^3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 348, normalized size of antiderivative = 0.63

$$\int x^2\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{d^2\sqrt{d-c^2dx^2}\left(1440a^3-96ab^2c^2x^2(-45+177c^2x^2-136c^4x^4+36c^6x^6)+288a^2bcx\sqrt{1-\right.}{}$$

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(1440*a^3 - 96*a*b^2*c^2*x^2*(-45 + 177*c^2*x^2 -
136*c^4*x^4 + 36*c^6*x^6) + 288*a^2*b*c*x*Sqrt[1 - c^2*x^2]*(-15 + 118*c^2*
x^2 - 136*c^4*x^4 + 48*c^6*x^6) - b^3*c*x*Sqrt[1 - c^2*x^2]*(1077 + 2158*c^
2*x^2 - 1672*c^4*x^4 + 432*c^6*x^6) + 3*b*(1440*a^2 + 192*a*b*c*x*Sqrt[1 -
c^2*x^2]*(-15 + 118*c^2*x^2 - 136*c^4*x^4 + 48*c^6*x^6) + b^2*(359 + 1440*c
^2*x^2 - 5664*c^4*x^4 + 4352*c^6*x^6 - 1152*c^8*x^8))*ArcSin[c*x] + 288*b^2
*(15*a + b*c*x*Sqrt[1 - c^2*x^2]*(-15 + 118*c^2*x^2 - 136*c^4*x^4 + 48*c^6*
x^6))*ArcSin[c*x]^2 + 1440*b^3*ArcSin[c*x]^3))/(110592*b*c^3*Sqrt[1 - c^2*x
^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.35 (sec) , antiderivative size = 1939, normalized size of antiderivative = 3.49

method	result	size
default	Expression too large to display	1939
parts	Expression too large to display	1939

```
[In] int(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/8*a^2*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+1/48*a^2/c^2*x*(-c^2*d*x^2+d)^(5/2)+5
/192*a^2/c^2*d*x*(-c^2*d*x^2+d)^(3/2)+5/128*a^2/c^2*d^2*x*(-c^2*d*x^2+d)^(1
/2)+5/128*a^2/c^2*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(
1/2))+b^2*(-5/384*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)
*arcsin(c*x)^3*d^2+1/65536*(-d*(c^2*x^2-1))^(1/2)*(-128*I*(-c^2*x^2+1)^(1/2
)*x^8*c^8+128*c^9*x^9+256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320*c^7*x^7-160*I*(-
c^2*x^2+1)^(1/2)*x^4*c^4+272*c^5*x^5+32*I*(-c^2*x^2+1)^(1/2)*c^2*x^2-88*c^3
*x^3-I*(-c^2*x^2+1)^(1/2)+8*c*x)*(8*I*arcsin(c*x)+32*arcsin(c*x)^2-1)*d^2/c
^3/(c^2*x^2-1)-1/6912*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*
x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)
^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*(6*I*arcsin(c*x)+18*a
rcsin(c*x)^2-1)*d^2/c^3/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2
*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-2*I*arcsin(c*
x)+2*arcsin(c*x)^2-1)*d^2/c^3/(c^2*x^2-1)+1/65536*(-d*(c^2*x^2-1))^(1/2)*(1
28*I*(-c^2*x^2+1)^(1/2)*x^8*c^8+128*c^9*x^9-256*I*(-c^2*x^2+1)^(1/2)*x^6*c^
6-320*c^7*x^7+160*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+272*c^5*x^5-32*I*(-c^2*x^2+1
)^(1/2)*x^2*c^2-88*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+8*c*x)*(-8*I*arcsin(c*x)+32
*arcsin(c*x)^2-1)*d^2/c^3/(c^2*x^2-1)+1/55296*(-d*(c^2*x^2-1))^(1/2)*(I*c^2
*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(156*I*arcsin(c*x)+72*arcsin(c*x)^2-19)*cos(
5*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-5/55296*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*
x^2+1)^(1/2)*x*c+c^2*x^2-1)*(12*I*arcsin(c*x)+72*arcsin(c*x)^2-7)*sin(5*arc
sin(c*x))*d^2/c^3/(c^2*x^2-1)-3/2048*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*
(-c^2*x^2+1)^(1/2)-I)*(4*I*arcsin(c*x)+8*arcsin(c*x)^2-3)*cos(3*arcsin(c*x)
)*d^2/c^3/(c^2*x^2-1)+1/2048*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x
*c+c^2*x^2-1)*(20*I*arcsin(c*x)+8*arcsin(c*x)^2-7)*sin(3*arcsin(c*x))*d^2/c
^3/(c^2*x^2-1))+2*a*b*(-5/256*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3
/(c^2*x^2-1)*arcsin(c*x)^2*d^2+1/16384*(-d*(c^2*x^2-1))^(1/2)*(-128*I*(-c^2
*x^2+1)^(1/2)*x^8*c^8+128*c^9*x^9+256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320*c^7*
x^7-160*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+272*c^5*x^5+32*I*(-c^2*x^2+1)^(1/2)*c^
2*x^2-88*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+8*c*x)*(8*arcsin(c*x)+I)*d^2/c^3/(c^2
*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*
x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)+1/14
7456*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(73*I+312*
arcsin(c*x))*cos(7*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-1/147456*(-d*(c^2*x^2-1
```

```
))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(55*I+456*arcsin(c*x))*sin(7*
arcsin(c*x))*d^2/c^3/(c^2*x^2-1)+1/9216*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c
*x*(-c^2*x^2+1)^(1/2)-I)*(13*I+12*arcsin(c*x))*cos(5*arcsin(c*x))*d^2/c^3/(
c^2*x^2-1)-5/9216*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-
1)*(I+12*arcsin(c*x))*sin(5*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-3/1024*(-d*(c^
2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(4*arcsin(c*x)+I)*cos(
3*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)+1/1024*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x
^2+1)^(1/2)*x*c+c^2*x^2-1)*(5*I+4*arcsin(c*x))*sin(3*arcsin(c*x))*d^2/c^3/(
c^2*x^2-1))
```

Fricas [F]

$$\int x^2 (d-c^2dx^2)^{5/2} (a+b\arcsin(cx))^2 \, dx = \int (-c^2dx^2+d)^{\frac{5}{2}} (b\arcsin(cx)+a)^2 x^2 \, dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
[Out] integral((a^2*c^4*d^2*x^6 - 2*a^2*c^2*d^2*x^4 + a^2*d^2*x^2 + (b^2*c^4*d^2*
x^6 - 2*b^2*c^2*d^2*x^4 + b^2*d^2*x^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^6 -
 2*a*b*c^2*d^2*x^4 + a*b*d^2*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int x^2 (d-c^2dx^2)^{5/2} (a+b\arcsin(cx))^2 \, dx = \text{Timed out}$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int x^2 (d-c^2dx^2)^{5/2} (a+b\arcsin(cx))^2 \, dx = \int (-c^2dx^2+d)^{\frac{5}{2}} (b\arcsin(cx)+a)^2 x^2 \, dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
[Out] 1/384*(8*(-c^2*d*x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d)
 + 10*(-c^2*d*x^2 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 +
15*d^(5/2)*arcsin(c*x)/c^3)*a^2 + sqrt(d)*integrate(((b^2*c^4*d^2*x^6 - 2*b
^2*c^2*d^2*x^4 + b^2*d^2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
+ 2*(a*b*c^4*d^2*x^6 - 2*a*b*c^2*d^2*x^4 + a*b*d^2*x^2)*arctan2(c*x, sqrt(c
*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F]

$$\int x^2 \left(d-c^2 d x^2\right)^{5/2} (a+b \arcsin(cx))^2 \, dx = \int \left(-c^2 d x^2+d\right)^{\frac{5}{2}} (b \arcsin{(cx)}+a)^2 x^2 \, dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2*x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^2 \left(d-c^2 d x^2\right)^{5/2} (a+b \arcsin(cx))^2 \, dx = \int x^2 \, (a+b \operatorname{asin}(c\, x))^2 \, \left(d-c^2\, d\, x^2\right)^{5/2} \, dx$$

```
[In] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
[Out] int(x^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

3.228 $\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 27, antiderivative size = 382

$$
\begin{aligned}
\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2\,dx &= \frac{32b^2d^2\sqrt{d-c^2dx^2}}{245c^2} \\
&+ \frac{16b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{735c^2} + \frac{12b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1225c^2} \\
&+ \frac{2b^2d^2(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^2} + \frac{2bd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} \\
&- \frac{2bcd^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} + \frac{6bc^3d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} \\
&- \frac{2bc^5d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))^2}{7c^2d}
\end{aligned}
$$

```
[Out] -1/7*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))^2/c^2/d+32/245*b^2*d^2*(-c^2*d*
x^2+d)^(1/2)/c^2+16/735*b^2*d^2*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+12/12
25*b^2*d^2*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^2+2/343*b^2*d^2*(-c^2*x^2+
1)^3*(-c^2*d*x^2+d)^(1/2)/c^2+2/7*b*d^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^
(1/2)/c/(-c^2*x^2+1)^(1/2)-2/7*b*c*d^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)
^(1/2)/(-c^2*x^2+1)^(1/2)+6/35*b*c^3*d^2*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+
d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/49*b*c^5*d^2*x^7*(a+b*arcsin(c*x))*(-c^2*d*x^
2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 382, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4767, 200, 4739, 12, 1813, 1864}

$$\int x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\frac{2bd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}}-\frac{2bcd^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}}-\frac{\left(d-c^2dx^2\right)^{7/2}(a+b\arcsin(cx))^2}{7c^2d}-\frac{2bc^5d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}}+\frac{6bc^3d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}}+\frac{2b^2d^2(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^2}+\frac{32b^2d^2\sqrt{d-c^2dx^2}}{245c^2}+\frac{12b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1225c^2}+\frac{16b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{735c^2}$$

```
[In] Int[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*d^2*Sqrt[d - c^2*d*x^2])/(245*c^2) + (16*b^2*d^2*(1 - c^2*x^2)*Sqrt
[d - c^2*d*x^2])/(735*c^2) + (12*b^2*d^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2
])/(1225*c^2) + (2*b^2*d^2*(1 - c^2*x^2)^3*Sqrt[d - c^2*d*x^2])/(343*c^2) +
 (2*b*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(7*c*Sqrt[1 - c^2*x^2]
) - (2*b*c*d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(7*Sqrt[1 - c^2
*x^2]) + (6*b*c^3*d^2*x^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(35*Sqrt
[1 - c^2*x^2]) - (2*b*c^5*d^2*x^7*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/
(49*Sqrt[1 - c^2*x^2]) - ((d - c^2*d*x^2)^(7/2)*(a + b*ArcSin[c*x])^2)/(7*c
^2*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))^2}{7c^2d} + \frac{\left(2bd^2\sqrt{d-c^2dx^2}\right)\int (1-c^2x^2)^3(a+b\arcsin(cx))\,dx}{7c\sqrt{1-c^2x^2}} \\
&= \frac{2bd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} \\
&\quad + \frac{6bc^3d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} \\
&\quad - \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))^2}{7c^2d} - \frac{\left(2b^2d^2\sqrt{d-c^2dx^2}\right)\int \frac{x(35-35c^2x^2+21c^4x^4-5c^6x^6)}{35\sqrt{1-c^2x^2}}\,dx}{7\sqrt{1-c^2x^2}} \\
&= \frac{2bd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} \\
&\quad + \frac{6bc^3d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} \\
&\quad - \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))^2}{7c^2d} - \frac{\left(2b^2d^2\sqrt{d-c^2dx^2}\right)\int \frac{x(35-35c^2x^2+21c^4x^4-5c^6x^6)}{\sqrt{1-c^2x^2}}\,dx}{245\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= \frac{2bd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} + \frac{6bc^3d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))^2}{7c^2d} - \frac{\left(b^2d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{35-35c^2x+21c^4x^2-5c^6x^3}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{245\sqrt{1-c^2x^2}}$$

$$= \frac{2bd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} + \frac{6bc^3d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))^2}{7c^2d} - \frac{\left(b^2d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \left(\frac{16}{\sqrt{1-c^2x}}+8\sqrt{1-c^2x}+6(1-c^2x)^{3/2}+5(1-c^2x)^{5/2}\right)dx,x,x^2\right)}{245\sqrt{1-c^2x^2}}$$

$$= \frac{32b^2d^2\sqrt{d-c^2dx^2}}{245c^2} + \frac{16b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{735c^2} + \frac{12b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1225c^2} + \frac{2b^2d^2(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^2} + \frac{2bd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}} - \frac{2bcd^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}} + \frac{6bc^3d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}} - \frac{(d-c^2dx^2)^{7/2}(a+b\arcsin(cx))^2}{7c^2d}$$

Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 176, normalized size of antiderivative = 0.46

$$\int x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{d^2\sqrt{d-c^2dx^2}\left(\left(-1+c^2x^2\right)^3(a+b\arcsin(cx))^2 - \frac{2b\left(105acx\left(-35+35c^2x^2-21c^4x^4+5c^6x^6\right)+b\sqrt{1-\right.}{}\right.}{7c^2}$$

```
[In] Integrate[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*((-1 + c^2*x^2)^3*(a + b*ArcSin[c*x])^2 - (2*b*(10
5*a*c*x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) + b*Sqrt[1 - c^2*x^2]*(
-2161 + 757*c^2*x^2 - 351*c^4*x^4 + 75*c^6*x^6) + 105*b*c*x*(-35 + 35*c^2*x
```

```
^2 - 21*c^4*x^4 + 5*c^6*x^6)*ArcSin[c*x]))/(3675*Sqrt[1 - c^2*x^2])))/(7*c^
2)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.43 (sec) , antiderivative size = 1611, normalized size of antiderivative = 4.22

method	result	size
default	Expression too large to display	1611
parts	Expression too large to display	1611

```
[In] int(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/7*a^2*(-c^2*d*x^2+d)^(7/2)/c^2/d+b^2*(1/43904*(-d*(c^2*x^2-1))^(1/2)*(64
*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^
2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2
*x^2+1)^(1/2)*x*c+1)*(14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2
-1)-1/3200*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^
(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(
1/2)*x*c-1)*(10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)-5/128
*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2
-2+2*I*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c
^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d^2/c^2/(c
^2*x^2-1)+1/384*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^
4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*
x)^2-2)*d^2/c^2/(c^2*x^2-1)+1/43904*(-d*(c^2*x^2-1))^(1/2)*(64*I*c^7*x^7*(-
c^2*x^2+1)^(1/2)+64*c^8*x^8-112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-144*c^6*x^6+56
*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+104*c^4*x^4-7*I*(-c^2*x^2+1)^(1/2)*x*c-25*c^2
*x^2+1)*(-14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)-1/2400*(
-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(30*I*arcsin(c*x
)+75*arcsin(c*x)^2-14)*cos(4*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/4800*(-d*(c
^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(90*I*arcsin(c*x)+75*
arcsin(c*x)^2-22)*sin(4*arcsin(c*x))*d^2/c^2/(c^2*x^2-1))+2*a*b*(1/6272*(-d
*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)
+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^
(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+7*arcsin(c*x))*d^2/c^2/(c^2*
x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(a
rcsin(c*x)+I)*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2
+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)*d^2/c^2/(c^2*x^2-1)+1/128*(-d*(c^2
*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(
1/2)*x*c-5*c^2*x^2+1)*(-I+3*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/7840*(-d*(c^
2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(11*I+70*arcsin(c*x))*
cos(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-3/15680*(-d*(c^2*x^2-1))^(1/2)*(I*c^
```

```
2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(9*I+35*arcsin(c*x))*sin(6*arcsin(c*x))*d^2
/c^2/(c^2*x^2-1)-1/160*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2
*x^2-1)*(I+5*arcsin(c*x))*cos(4*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-1/320*(-d*
(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(3*I+5*arcsin(c*x))
*sin(4*arcsin(c*x))*d^2/c^2/(c^2*x^2-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 405, normalized size of antiderivative = 1.06

$$\int x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{210\,(5\,abc^7d^2x^7-21\,abc^5d^2x^5+35\,abc^3d^2x^3-35\,abcd^2x+(5\,b^2c^7d^2x^7-21\,b^2c^5d^2x^5+$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/25725*(210*(5*a*b*c^7*d^2*x^7 - 21*a*b*c^5*d^2*x^5 + 35*a*b*c^3*d^2*x^3 -
 35*a*b*c*d^2*x + (5*b^2*c^7*d^2*x^7 - 21*b^2*c^5*d^2*x^5 + 35*b^2*c^3*d^2*
x^3 - 35*b^2*c*d^2*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1)
+ (75*(49*a^2 - 2*b^2)*c^8*d^2*x^8 - 12*(1225*a^2 - 71*b^2)*c^6*d^2*x^6 + 2
*(11025*a^2 - 1108*b^2)*c^4*d^2*x^4 - 4*(3675*a^2 - 1459*b^2)*c^2*d^2*x^2 +
 (3675*a^2 - 4322*b^2)*d^2 + 3675*(b^2*c^8*d^2*x^8 - 4*b^2*c^6*d^2*x^6 + 6*
b^2*c^4*d^2*x^4 - 4*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 7350*(a*b*c^
8*d^2*x^8 - 4*a*b*c^6*d^2*x^6 + 6*a*b*c^4*d^2*x^4 - 4*a*b*c^2*d^2*x^2 + a*b
*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^4*x^2 - c^2)
```

Sympy [F]

$$\int x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx = \int x(-d(cx-1)\,(cx+1))^{\frac{5}{2}}\,(a+b\,\mathrm{asin}\,(cx))^2\,dx$$

```
[In] integrate(x*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x*(-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2, x)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 281, normalized size of antiderivative = 0.74

$$\int x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx =$$
$$-\frac{(-c^2dx^2+d)^{\frac{7}{2}}b^2\arcsin(cx)^2}{7\,c^2d}-\frac{2\,(-c^2dx^2+d)^{\frac{7}{2}}ab\arcsin(cx)}{7\,c^2d}$$
$$-\frac{2}{25725}\,b^2\left(\frac{75\sqrt{-c^2x^2+1}c^4d^{\frac{7}{2}}x^6-351\sqrt{-c^2x^2+1}c^2d^{\frac{7}{2}}x^4+757\sqrt{-c^2x^2+1}d^{\frac{7}{2}}x^2-\frac{2161\sqrt{-c^2x^2+1}d^{\frac{7}{2}}}{c^2}}{d}+105\right.$$
$$-\frac{(-c^2dx^2+d)^{\frac{7}{2}}a^2}{7\,c^2d}-\frac{2\left(5\,c^6d^{\frac{7}{2}}x^7-21\,c^4d^{\frac{7}{2}}x^5+35\,c^2d^{\frac{7}{2}}x^3-35\,d^{\frac{7}{2}}x\right)ab}{245\,cd}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/7*(-c^2*d*x^2 + d)^(7/2)*b^2*arcsin(c*x)^2/(c^2*d) - 2/7*(-c^2*d*x^2 + d
)^(7/2)*a*b*arcsin(c*x)/(c^2*d) - 2/25725*b^2*((75*sqrt(-c^2*x^2 + 1)*c^4*d
^(7/2)*x^6 - 351*sqrt(-c^2*x^2 + 1)*c^2*d^(7/2)*x^4 + 757*sqrt(-c^2*x^2 + 1
)*d^(7/2)*x^2 - 2161*sqrt(-c^2*x^2 + 1)*d^(7/2)/c^2)/d + 105*(5*c^6*d^(7/2)
*x^7 - 21*c^4*d^(7/2)*x^5 + 35*c^2*d^(7/2)*x^3 - 35*d^(7/2)*x)*arcsin(c*x)/
(c*d)) - 1/7*(-c^2*d*x^2 + d)^(7/2)*a^2/(c^2*d) - 2/245*(5*c^6*d^(7/2)*x^7
- 21*c^4*d^(7/2)*x^5 + 35*c^2*d^(7/2)*x^3 - 35*d^(7/2)*x)*a*b/(c*d)
```

Giac [F(-2)]

Exception generated.

$$\int x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2\,dx=\int x\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
[Out] int(x*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

3.229 $\int (d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 26, antiderivative size = 438

$$\begin{aligned}\int (d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2\,dx &= -\frac{245b^2d^2x\sqrt{d-c^2dx^2}}{1152}\\
&-\frac{65b^2d^2x(1-c^2x^2)\sqrt{d-c^2dx^2}}{1728}-\frac{1}{108}b^2d^2x(1-c^2x^2)^2\sqrt{d-c^2dx^2}\\
&+\frac{115b^2d^2\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c\sqrt{1-c^2x^2}}-\frac{5bcd^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}}\\
&+\frac{5bd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c}\\
&+\frac{bd^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c}\\
&+\frac{5}{16}d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{5}{24}dx(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2+\frac{1}{6}x(d-c^2dx^2)^{5/2}(a+b\arcsin(
\end{aligned}$$

```
[Out] 5/24*d*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2+1/6*x*(-c^2*d*x^2+d)^(5/2
)*(a+b*arcsin(c*x))^2-245/1152*b^2*d^2*x*(-c^2*d*x^2+d)^(1/2)-65/1728*b^2*d
^2*x*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)-1/108*b^2*d^2*x*(-c^2*x^2+1)^2*(-c^2
*d*x^2+d)^(1/2)+5/48*b*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2
+d)^(1/2)/c+1/18*b*d^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^
(1/2)/c+5/16*d^2*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+115/1152*b^2*d^
2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-5/16*b*c*d^2*x^2*(a
+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/48*d^2*(a+b*arcsi
n(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 438, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {4743, 4741, 4737, 4723, 327, 222, 4767, 201}

$$\int \left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc\sqrt{1-c^2x^2}}$$
$$+\frac{5}{16}d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{bd^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c}$$
$$+\frac{5bd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c}-\frac{5bcd^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}}$$
$$+\frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2+\frac{5}{24}dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{115b^2d^2\arcsin(cx)\sqrt{d-c^2dx^2}}{1152c\sqrt{1-c^2x^2}}$$

```
[In] Int[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-245*b^2*d^2*x*Sqrt[d - c^2*d*x^2])/1152 - (65*b^2*d^2*x*(1 - c^2*x^2)*Sqr
t[d - c^2*d*x^2])/1728 - (b^2*d^2*x*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/10
8 + (115*b^2*d^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(1152*c*Sqrt[1 - c^2*x^2]
) - (5*b*c*d^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(16*Sqrt[1 - c^
2*x^2]) + (5*b*d^2*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x]))/(48*c) + (b*d^2*(1 - c^2*x^2)^(5/2)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/(18*c) + (5*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/16 + (5
*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/24 + (x*(d - c^2*d*x^2)^(
5/2)*(a + b*ArcSin[c*x])^2)/6 + (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])^3)/(48*b*c*Sqrt[1 - c^2*x^2])
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
```

```
x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\text{integral} = \frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2+\frac{1}{6}(5d)\int\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx - \frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))\,dx}{3\sqrt{1-c^2x^2}}$$

$$= \frac{bd^2\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c}+\frac{5}{24}dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2+\frac{1}{8}\left(5d^2\right)\int\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx-\frac{\left(b^2d^2\sqrt{d-c^2\right.}{1}$$

$$= -\frac{1}{108}b^2d^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}+\frac{5bd^2\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c} + \frac{bd^2\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c}+\frac{5}{16}d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{24}dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2+\frac{\left(5d^2\sqrt{d-c^2dx^2}\right)\int}{16\sqrt{1-}}$$

$$= -\frac{65b^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{1728}-\frac{1}{108}b^2d^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2} - \frac{5bcd^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}} + \frac{5bd^2\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c} + \frac{bd^2\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c} + \frac{5}{16}d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{24}dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2+\frac{5d^2\sqrt{d-c^2dx^2}(a-}{48bc\sqrt{1-}}$$

$$= -\frac{245b^2d^2x\sqrt{d-c^2dx^2}}{1152}-\frac{65b^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}}{1728}-\frac{1}{108}b^2d^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2} - \frac{5bcd^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}}+\frac{5bd^2\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c} + \frac{bd^2\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c}+\frac{5}{16}d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{24}dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{1}{6}x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2+\frac{5d^2\sqrt{d-c^2dx^2}(a-}{48bc\sqrt{1-}}$$

$$= -\frac{245b^2d^2x\sqrt{d-c^2dx^2}}{1152} - \frac{65b^2d^2x(1-c^2x^2)\sqrt{d-c^2dx^2}}{1728} - \frac{1}{108}b^2d^2x(1-c^2x^2)^2\sqrt{d-c^2dx^2} + \frac{115b^2d^2\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c\sqrt{1-c^2x^2}} - \frac{5bcd^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}} + \frac{5bd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c} + \frac{bd^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c} + \frac{5}{16}d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5}{24}dx(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{6}x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2 + \frac{5d^2\sqrt{d-c^2dx^2}(a+}{48bc\sqrt{1-}}$$

Mathematica [A] (verified)

Time = 0.79 (sec) , antiderivative size = 299, normalized size of antiderivative = 0.68

$$\int (d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{d^2\sqrt{d-c^2dx^2}(360a^3+b^3cx\sqrt{1-c^2x^2}(-897+194c^2x^2-32c^4x^4)-24ab^2c^2x^2(99-39c}{}$$

```
[In] Integrate[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*Sqrt[d - c^2*d*x^2]*(360*a^3 + b^3*c*x*Sqrt[1 - c^2*x^2]*(-897 + 194*c
^2*x^2 - 32*c^4*x^4) - 24*a*b^2*c^2*x^2*(99 - 39*c^2*x^2 + 8*c^4*x^4) + 72*
a^2*b*c*x*Sqrt[1 - c^2*x^2]*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 3*b*(360*a^2 +
48*a*b*c*x*Sqrt[1 - c^2*x^2]*(33 - 26*c^2*x^2 + 8*c^4*x^4) + b^2*(299 - 792
*c^2*x^2 + 312*c^4*x^4 - 64*c^6*x^6))*ArcSin[c*x] + 72*b^2*(15*a + b*c*x*Sq
rt[1 - c^2*x^2]*(33 - 26*c^2*x^2 + 8*c^4*x^4))*ArcSin[c*x]^2 + 360*b^3*ArcS
in[c*x]^3))/(3456*b*c*Sqrt[1 - c^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.27 (sec) , antiderivative size = 1349, normalized size of antiderivative = 3.08

method	result	size
default	Expression too large to display	1349
parts	Expression too large to display	1349

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*x*(-c^2*d*x^2+d)^(5/2)*a^2+5/24*a^2*d*x*(-c^2*d*x^2+d)^(3/2)+5/16*a^2*d
^2*x*(-c^2*d*x^2+d)^(1/2)+5/16*a^2*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x
/(-c^2*d*x^2+d)^(1/2))+b^2*(-5/48*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)
/c/(c^2*x^2-1)*arcsin(c*x)^3*d^2+1/6912*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2
*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5
-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*(6*
I*arcsin(c*x)+18*arcsin(c*x)^2-1)*d^2/c/(c^2*x^2-1)+15/256*(-d*(c^2*x^2-1))
^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x
)*(-2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)*d^2/c/(c^2*x^2-1)-1/27648*(-d*(c^2*x
^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(348*I*arcsin(c*x)+576*ar
csin(c*x)^2-77)*cos(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)+5/27648*(-d*(c^2*x^2-1
))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(60*I*arcsin(c*x)+144*arcsin(
c*x)^2-17)*sin(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)-3/1024*(-d*(c^2*x^2-1))^(1/
2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(44*I*arcsin(c*x)+32*arcsin(c*x)^2-
19)*cos(3*arcsin(c*x))*d^2/c/(c^2*x^2-1)+9/1024*(-d*(c^2*x^2-1))^(1/2)*(I*(
-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(12*I*arcsin(c*x)+16*arcsin(c*x)^2-7)*sin(
3*arcsin(c*x))*d^2/c/(c^2*x^2-1))+2*a*b*(-5/32*(-d*(c^2*x^2-1))^(1/2)*(-c^2
*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*d^2+1/2304*(-d*(c^2*x^2-1))^(1/2)
*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c
^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/
2)-6*c*x)*(I+6*arcsin(c*x))*d^2/c/(c^2*x^2-1)+15/256*(-d*(c^2*x^2-1))^(1/2)
*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+
2*arcsin(c*x))*d^2/c/(c^2*x^2-1)-1/4608*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c
*x*(-c^2*x^2+1)^(1/2)-I)*(29*I+96*arcsin(c*x))*cos(5*arcsin(c*x))*d^2/c/(c^
2*x^2-1)+5/4608*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)
*(5*I+24*arcsin(c*x))*sin(5*arcsin(c*x))*d^2/c/(c^2*x^2-1)-3/512*(-d*(c^2*x
^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(11*I+16*arcsin(c*x))*cos
(3*arcsin(c*x))*d^2/c/(c^2*x^2-1)+9/512*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2
+1)^(1/2)*x*c+c^2*x^2-1)*(3*I+8*arcsin(c*x))*sin(3*arcsin(c*x))*d^2/c/(c^2*
x^2-1))
```

Fricas [F]

$$\int \left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \text{Timed out}$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
[Out] Timed out
```

Maxima [F]

$$\int \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}} (b\arcsin{(cx)}+a)^2 \, dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] 1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt(
-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a^2 + sqrt(d)*integrate((
(b^2*c^4*d^2*x^4 - 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx=\int \left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
[Out] int((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

3.230 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 687

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x}\,dx = -\frac{598}{225}b^2d^2\sqrt{d-c^2dx^2} - \frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{74}{675}b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2} - \frac{2}{125}b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2} - \frac{2b^2cd^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} - \frac{16bcd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{22bc^3d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{3}d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{5}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2 - \frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2ibd^2\sqrt{d-c^2dx}}{}$$

```
[Out] 1/3*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2+1/5*(-c^2*d*x^2+d)^(5/2)*(a+
b*arcsin(c*x))^2-598/225*b^2*d^2*(-c^2*d*x^2+d)^(1/2)-74/675*b^2*d^2*(-c^2*
x^2+1)*(-c^2*d*x^2+d)^(1/2)-2/125*b^2*d^2*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/
2)+d^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-2*a*b*c*d^2*x*(-c^2*d*x^2+d
)^(1/2)/(-c^2*x^2+1)^(1/2)-2*b^2*c*d^2*x*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)-16/15*b*c*d^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-
c^2*x^2+1)^(1/2)+22/45*b*c^3*d^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)
/(-c^2*x^2+1)^(1/2)-2/25*b*c^5*d^2*x^5*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/
2)/(-c^2*x^2+1)^(1/2)-2*d^2*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^
(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2*I*b*d^2*(a+b*arcsin(c*x))*
polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2
)-2*I*b*d^2*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x
^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2*b^2*d^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2
```

```
))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2*b^2*d^2*polylog(3,I*c*x+(-c^2*
x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.59 (sec) , antiderivative size = 687, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.552, Rules used = {4787, 4783, 4803, 4268, 2611, 2320, 6724, 4715, 267, 4739, 455, 45, 200, 12, 1261, 712}

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x}\,dx = -\frac{2d^2\sqrt{d-c^2dx^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} + \frac{2ibd^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} - \frac{2ibd^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} - \frac{16bcd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{5}\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 + \frac{1}{3}d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 - \frac{2bc^5d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + \frac{22bc^3d^2x^3\sqrt{d-c^2dx^2}(a+b\,a}{45\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (-598*b^2*d^2*Sqrt[d - c^2*d*x^2])/225 - (2*a*b*c*d^2*x*Sqrt[d - c^2*d*x^2]
)/Sqrt[1 - c^2*x^2] - (74*b^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/675 -
(2*b^2*d^2*(1 - c^2*x^2)^2*Sqrt[d - c^2*d*x^2])/125 - (2*b^2*c*d^2*x*Sqrt[d
 - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (16*b*c*d^2*x*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x]))/(15*Sqrt[1 - c^2*x^2]) + (22*b*c^3*d^2*x^3*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(45*Sqrt[1 - c^2*x^2]) - (2*b*c^5*d^2*x
^5*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(25*Sqrt[1 - c^2*x^2]) + d^2*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2 + (d*(d - c^2*d*x^2)^(3/2)*(a + b*A
rcSin[c*x])^2)/3 + ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/5 - (2*d^2
*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt
[1 - c^2*x^2] + ((2*I)*b*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLo
g[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((2*I)*b*d^2*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] -
(2*b^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2
*x^2] + (2*b^2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[
1 - c^2*x^2]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
```

```
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
```

```
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{5}\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2+d\int\frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx \\
&\quad-\frac{\left(2bcd^2\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)^2(a+b\arcsin(cx))\,dx}{5\sqrt{1-c^2x^2}} \\
&=-\frac{2bcd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5\sqrt{1-c^2x^2}}+\frac{4bc^3d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} \\
&\quad-\frac{2bc^5d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}+\frac{1}{3}d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 \\
&\quad+\frac{1}{5}\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2+d^2\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}\,dx \\
&\quad-\frac{\left(2bcd^2\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{3\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(2b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x\left(15-10c^2x^2+3c^4x^4\right)}{15\sqrt{1-c^2x^2}}\,dx}{5\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{16bcd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{22bc^3d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{3}d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{5}\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 + \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(2bcd^2\sqrt{d-c^2dx^2}\right)\int(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x(15-10c^2x^2+3c^4x^4)}{\sqrt{1-c^2x^2}}\,dx}{75\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{16bcd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{22bc^3d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{3}d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{5}\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 + \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int(a+bx)^2\csc(x)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2b^2cd^2\sqrt{d-c^2dx^2}\right)\int\arcsin(cx)\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{15-10c^2x+3c^4x^2}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{75\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{3\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{2b^2cd^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{16bcd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{22bc^3d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45\sqrt{1-c^2x^2}} \\
&\quad - \frac{2bc^5d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{3}d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{5}\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2bd^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int(a+bx)\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2bd^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int(a+bx)\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\left(\frac{8}{\sqrt{1-c^2x}}+4\sqrt{1-c^2x}+3(1-c^2x)^{3/2}\right)dx,x,x^2\right)}{75\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\left(\frac{2}{3\sqrt{1-c^2x}}+\frac{1}{3}\sqrt{1-c^2x}\right)dx,x,x^2\right)}{3\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{598}{225}b^2d^2\sqrt{d-c^2dx^2} - \frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{74}{675}b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}$$
$$- \frac{2}{125}b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2} - \frac{2b^2cd^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}}$$
$$- \frac{16bcd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{22bc^3d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45\sqrt{1-c^2x^2}}$$
$$- \frac{2bc^5d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$+ \frac{1}{3}d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{5}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2$$
$$- \frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$+ \frac{2ibd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$- \frac{2ibd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$- \frac{\left(2ib^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int \operatorname{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(2ib^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int \operatorname{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{598}{225}b^2d^2\sqrt{d-c^2dx^2} - \frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{74}{675}b^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}$$
$$- \frac{2}{125}b^2d^2\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2} - \frac{2b^2cd^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}}$$
$$- \frac{16bcd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{22bc^3d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45\sqrt{1-c^2x^2}}$$
$$- \frac{2bc^5d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$+ \frac{1}{3}d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{5}\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2$$
$$- \frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$+ \frac{2ibd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$- \frac{2ibd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$- \frac{\left(2b^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(2b^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{598}{225}b^2d^2\sqrt{d-c^2dx^2} - \frac{2abcd^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{74}{675}b^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2} - \frac{2}{125}b^2d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2} - \frac{2b^2cd^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} - \frac{16bcd^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{22bc^3d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{3}d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 + \frac{1}{5}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2 - \frac{2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2ibd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2ibd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2b^2d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2b^2d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 3.63 (sec) , antiderivative size = 775, normalized size of antiderivative = 1.13

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x}\,dx = \frac{d^2\left(3600a^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(23-11c^2x^2+3c^4x^4)+54000a^2\right.}{}$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (d^2*(3600*a^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*(23 - 11*c^2*x^2 + 3*c
^4*x^4) + 54000*a^2*Sqrt[d]*Sqrt[1 - c^2*x^2]*Log[c*x] - 54000*a^2*Sqrt[d]*
Sqrt[1 - c^2*x^2]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] - 108000*a*b*Sqrt[d
- c^2*d*x^2]*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c*x] - ArcSin[c*x]*(Log[1 - E^
(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) - I*(PolyLog[2, -E^(I*ArcSin
[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])])) - 54000*b^2*Sqrt[d - c^2*d*x^2]*(
2*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 -
 ArcSin[c*x]^2*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) -
(2*I)*ArcSin[c*x]*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[
c*x])]) + 2*(PolyLog[3, -E^(I*ArcSin[c*x])] - PolyLog[3, E^(I*ArcSin[c*x])]
)) - 6000*a*b*Sqrt[d - c^2*d*x^2]*(9*c*x - 3*ArcSin[c*x]*(3*Sqrt[1 - c^2*x^
2] + Cos[3*ArcSin[c*x]]) + Sin[3*ArcSin[c*x]]) + 1000*b^2*Sqrt[d - c^2*d*x^
```

```
2]*(27*Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x]^2) + (-2 + 9*ArcSin[c*x]^2)*Cos[
3*ArcSin[c*x]] - 6*ArcSin[c*x]*(9*c*x + Sin[3*ArcSin[c*x]])) + 30*a*b*Sqrt[
d - c^2*d*x^2]*(450*c*x - 15*ArcSin[c*x]*(30*Sqrt[1 - c^2*x^2] + 5*Cos[3*Ar
cSin[c*x]] - 3*Cos[5*ArcSin[c*x]]) + 25*Sin[3*ArcSin[c*x]] - 9*Sin[5*ArcSin
[c*x]]) - b^2*Sqrt[d - c^2*d*x^2]*(6750*Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x]
^2) + 125*(-2 + 9*ArcSin[c*x]^2)*Cos[3*ArcSin[c*x]] - 27*(-2 + 25*ArcSin[c*
x]^2)*Cos[5*ArcSin[c*x]] + 30*ArcSin[c*x]*(-25*Sin[3*ArcSin[c*x]] + 9*(-50*
c*x + Sin[5*ArcSin[c*x]])))))/(54000*Sqrt[1 - c^2*x^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1489 vs. 2(657) = 1314.

Time = 0.34 (sec) , antiderivative size = 1490, normalized size of antiderivative = 2.17

method	result	size
default	Expression too large to display	1490
parts	Expression too large to display	1490

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/5*(-c^2*d*x^2+d)^(5/2)*a^2+1/3*a^2*d*(-c^2*d*x^2+d)^(3/2)-a^2*d^(5/2)*ln(
(2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+a^2*d^2*(-c^2*d*x^2+d)^(1/2)+b^2*(1
/4000*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)
*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*
x*c-1)*(10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)*d^2/(c^2*x^2-1)-7/864*(-d*(c^2
*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^
2*x^2+1)^(1/2)*x*c+1)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d^2/(c^2*x^2-1)+1
1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*
x)^2-2+2*I*arcsin(c*x))*d^2/(c^2*x^2-1)+11/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c
^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d^2/(c^2*x
^2-1)-7/864*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^
4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2
-2)*d^2/(c^2*x^2-1)+1/4000*(-d*(c^2*x^2-1))^(1/2)*(16*I*c^5*x^5*(-c^2*x^2+1
)^(1/2)+16*c^6*x^6-20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-28*c^4*x^4+5*I*(-c^2*x^2
+1)^(1/2)*x*c+13*c^2*x^2-1)*(-10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)*d^2/(c^2
*x^2-1)+(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*(arcsin(c*x)^
2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2
))-2*I*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*pol
ylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2*p
olylog(3,I*c*x+(-c^2*x^2+1)^(1/2)))*d^2)-22/45*a*b*(-d*(c^2*x^2-1))^(1/2)*d
^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x^3*c^3+46/15*a*b*(-d*(c^2*x^2-1))^(1/2)*
d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x*c+2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x
^2+1)^(1/2)/(c^2*x^2-1)*d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*a*
```

```
b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*arcsin(c*x)*ln(
1-I*c*x-(-c^2*x^2+1)^(1/2))-46/15*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1
)*arcsin(c*x)+2/25*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^
(1/2)*x^5*c^5+68/15*a*b*(-d*(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*
x^2*c^2-2*I*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*d^2*p
olylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^
2+1)^(1/2)/(c^2*x^2-1)*d^2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2/5*a*b*(-d*
(c^2*x^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*x^6*c^6-28/15*a*b*(-d*(c^2*x
^2-1))^(1/2)*d^2/(c^2*x^2-1)*arcsin(c*x)*x^4*c^4
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="fricas")
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x}\,dx = \int \frac{(-d(cx-1)(cx+1))^{\frac{5}{2}}(a+b\operatorname{asin}(cx))^2}{x}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/x,x)
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2/x, x)
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="maxima")
[Out] -1/15*(15*d^(5/2)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) -
 3*(-c^2*d*x^2 + d)^(5/2) - 5*(-c^2*d*x^2 + d)^(3/2)*d - 15*sqrt(-c^2*d*x^2
 + d)*d^2)*a^2 + sqrt(d)*integrate(((b^2*c^4*d^2*x^4 - 2*b^2*c^2*d^2*x^2 +
b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*x^4
- 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*
sqrt(c*x + 1)*sqrt(-c*x + 1)/x, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{5/2}}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x, x)
```

3.231 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^2}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 561

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^2}\,dx = \frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2} + \frac{1}{32}b^2c^2d^2x(1-c^2x^2)\sqrt{d-c^2dx^2} - \frac{89b^2cd^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64\sqrt{1-c^2x^2}} + \frac{15bc^3d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + bcd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{1}{8}bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{icd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{5}{4}c^2dx(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x} - \frac{5cd^2\sqrt{d-c^2dx^2}(a+b\arcsin(}{8b\sqrt{1-c^2x^2}}$$

```
[Out] -5/4*c^2*d*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2-(-c^2*d*x^2+d)^(5/2)*
(a+b*arcsin(c*x))^2/x+31/64*b^2*c^2*d^2*x*(-c^2*d*x^2+d)^(1/2)+1/32*b^2*c^2
*d^2*x*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)-1/8*b*c*d^2*(-c^2*x^2+1)^(3/2)*(a+
b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-15/8*c^2*d^2*x*(a+b*arcsin(c*x))^2*(-c^
2*d*x^2+d)^(1/2)-89/64*b^2*c*d^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2
+1)^(1/2)+15/8*b*c^3*d^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x
^2+1)^(1/2)-I*c*d^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(
1/2)-5/8*c*d^2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/(-c^2*x^2+1)^(1/2
)+2*b*c*d^2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*d*x^
2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b^2*c*d^2*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/
2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+b*c*d^2*(a+b*arcsin(c*x))*(-
c^2*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 561, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.517, Rules used = {4785, 4743, 4741, 4737, 4723, 327, 222, 4767, 201, 4773, 4721, 3798, 2221, 2317, 2438}

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^2}\,dx = -\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{5cd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8b\sqrt{1-c^2x^2}} - \frac{icd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{1}{8}bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + bcd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{2bcd^2\sqrt{d-c^2dx^2}\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} - \frac{5}{4}c^2dx(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x} + \frac{15bc^3d^2x^2\sqrt{d-c^2dx^2}(a+b\arc}{8\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (31*b^2*c^2*d^2*x*Sqrt[d - c^2*d*x^2])/64 + (b^2*c^2*d^2*x*(1 - c^2*x^2)*Sq
rt[d - c^2*d*x^2])/32 - (89*b^2*c*d^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(64*
Sqrt[1 - c^2*x^2]) + (15*b*c^3*d^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x]))/(8*Sqrt[1 - c^2*x^2]) + b*c*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*
(a + b*ArcSin[c*x]) - (b*c*d^2*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d*x^2]*(a +
 b*ArcSin[c*x]))/8 - (15*c^2*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^
2)/8 - (I*c*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2
] - (5*c^2*d*x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/4 - ((d - c^2*d
*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x - (5*c*d^2*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x])^3)/(8*b*Sqrt[1 - c^2*x^2]) + (2*b*c*d^2*Sqrt[d - c^2*d*x^2]*(a
 + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^
2*c*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2
*x^2]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
```

```
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x} - (5c^2d)\int (d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2\,dx + \frac{\left(2bcd^2\sqrt{d-c^2dx^2}\right)\int \frac{(1-c^2x^2)^2(a+b\arcsin(cx))}{x}\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{5}{4}c^2dx(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x} - \frac{1}{4}(15c^2d^2)\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx + \frac{\left(2bcd^2\sqrt{d-c^2dx^2}\right)\int \frac{(1-c^2x^2)(a+b\arcsin(cx))}{x}\,dx}{\sqrt{1-c^2x^2}} -$$

$$= -\frac{1}{8}b^2c^2d^2x(1-c^2x^2)\sqrt{d-c^2dx^2} + bcd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{1}{8}bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{5}{4}c^2dx(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x} + \frac{\left(2bcd^2\sqrt{d-c^2dx^2}\right)\int \frac{a+b\arcsin(cx)}{x}\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(15c^2d^2\sqrt{d-c^2dx^2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(3b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int \sqrt{1-c^2x^2}\,dx}{8\sqrt{1-c^2x^2}} + \frac{\left(5b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int (1-c^2x^2)^{3/2}\,dx}{8\sqrt{1-c^2x^2}} - \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int \sqrt{1-c^2x^2}\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(15bc^3d^2\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}}$$

$$=-\frac{11}{16}b^2c^2d^2x\sqrt{d-c^2dx^2}+\frac{1}{32}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}+\frac{15bc^3d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}+bcd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{1}{8}bcd^2\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{x}-\frac{5cd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8b\sqrt{1-c^2x^2}}+\frac{\left(2bcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}-\frac{\left(3b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}}+\frac{\left(15b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}\,dx}{32\sqrt{1-c^2x^2}}-\frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}-\frac{\left(15b^2c^4d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}}$$

$$=\frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2}+\frac{1}{32}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}-\frac{11b^2cd^2\sqrt{d-c^2dx^2}\arcsin(cx)}{16\sqrt{1-c^2x^2}}+\frac{15bc^3d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}+bcd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{1}{8}bcd^2\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{icd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{x}-\frac{5cd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8b\sqrt{1-c^2x^2}}-\frac{\left(4ibcd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}+\frac{\left(15b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{64\sqrt{1-c^2x^2}}-\frac{\left(15b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}}$$

$$=\frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2}+\frac{1}{32}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}-\frac{89b^2cd^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64\sqrt{1-c^2x^2}}+\frac{15bc^3d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}+bcd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{1}{8}bcd^2\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{icd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{x}-\frac{5cd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8b\sqrt{1-c^2x^2}}+\frac{2bcd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}-\frac{\left(2b^2cd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$=\frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2}+\frac{1}{32}b^2c^2d^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}-\frac{89b^2cd^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64\sqrt{1-c^2x^2}}+\frac{15bc^3d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}+bcd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{1}{8}bcd^2\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{icd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{5}{4}c^2dx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{x}-\frac{5cd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8b\sqrt{1-c^2x^2}}+\frac{2bcd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}+\frac{\left(ib^2cd^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{31}{64}b^2c^2d^2x\sqrt{d-c^2dx^2} + \frac{1}{32}b^2c^2d^2x(1-c^2x^2)\sqrt{d-c^2dx^2} \\
&\quad - \frac{89b^2cd^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64\sqrt{1-c^2x^2}} + \frac{15bc^3d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&\quad + bcd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{1}{8}bcd^2(1 \\
&\quad - c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{15}{8}c^2d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{icd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{5}{4}c^2dx(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 \\
&\quad - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x} - \frac{5cd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8b\sqrt{1-c^2x^2}} \\
&\quad + \frac{2bcd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{ib^2cd^2\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 2.31 (sec) , antiderivative size = 586, normalized size of antiderivative = 1.04

$$
\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^2}\,dx = \frac{d^2\left(-256a^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2} - 288a^2c^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\right.}{}
$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (d^2*(-256*a^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] - 288*a^2*c^2*x^2*Sqrt
[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] + 64*a^2*c^4*x^4*Sqrt[1 - c^2*x^2]*Sqrt[d
 - c^2*d*x^2] - 160*b^2*c*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^3 + 480*a^2*c*S
qrt[d]*x*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 +
c^2*x^2))] - 128*a*b*c*x*Sqrt[d - c^2*d*x^2]*Cos[2*ArcSin[c*x]] - 4*a*b*c*x
*Sqrt[d - c^2*d*x^2]*Cos[4*ArcSin[c*x]] + 512*a*b*c*x*Sqrt[d - c^2*d*x^2]*L
og[c*x] - (256*I)*b^2*c*x*Sqrt[d - c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*
x])] + 64*b^2*c*x*Sqrt[d - c^2*d*x^2]*Sin[2*ArcSin[c*x]] + b^2*c*x*Sqrt[d -
 c^2*d*x^2]*Sin[4*ArcSin[c*x]] - 4*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]*(128*a
*Sqrt[1 - c^2*x^2] + 32*b*c*x*Cos[2*ArcSin[c*x]] + b*c*x*Cos[4*ArcSin[c*x]]
 - 128*b*c*x*Log[1 - E^((2*I)*ArcSin[c*x])] + 64*a*c*x*Sin[2*ArcSin[c*x]] +
 4*a*c*x*Sin[4*ArcSin[c*x]]) - 8*b*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^2*(60*a*
c*x + (32*I)*b*c*x + 32*b*Sqrt[1 - c^2*x^2] + 16*b*c*x*Sin[2*ArcSin[c*x]] +
 b*c*x*Sin[4*ArcSin[c*x]])))/(256*x*Sqrt[1 - c^2*x^2])
```

Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 972, normalized size of antiderivative = 1.73

method	result
default	$-\frac{a^2(-c^2dx^2+d)^{\frac{7}{2}}}{dx}-a^2c^2x(-c^2dx^2+d)^{\frac{5}{2}}-\frac{5(-c^2dx^2+d)^{\frac{3}{2}}a^2c^2dx}{4}-\frac{15a^2d^2\sqrt{-c^2dx^2+d}\,c^2x}{8}-\frac{15a^2c^2d^3\arctan\left(\right.}{8\sqrt{c^2}}$
parts	$-\frac{a^2(-c^2dx^2+d)^{\frac{7}{2}}}{dx}-a^2c^2x(-c^2dx^2+d)^{\frac{5}{2}}-\frac{5(-c^2dx^2+d)^{\frac{3}{2}}a^2c^2dx}{4}-\frac{15a^2d^2\sqrt{-c^2dx^2+d}\,c^2x}{8}-\frac{15a^2c^2d^3\arctan\left(\right.}{8\sqrt{c^2}}$

[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^2,x,method=_RETURNVERBOSE)

[Out] -a^2/d/x*(-c^2*d*x^2+d)^(7/2)-a^2*c^2*x*(-c^2*d*x^2+d)^(5/2)-5/4*(-c^2*d*x^2+d)^(3/2)*a^2*c^2*d*x-15/8*a^2*d^2*(-c^2*d*x^2+d)^(1/2)*c^2*x-15/8*a^2*c^2*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^2*(5/8*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^3*c*d^2+1/512*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)*c*d^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)*c*d^2/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*arcsin(c*x)^2*d^2/(c^2*x^2-1)/x+2*I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+arcsin(c*x)^2+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)))*c*d^2+3/512*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(44*I*arcsin(c*x)+40*arcsin(c*x)^2-21)*cos(3*arcsin(c*x))*c*d^2/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(124*I*arcsin(c*x)+136*arcsin(c*x)^2-65)*sin(3*arcsin(c*x))*c*d^2/(c^2*x^2-1))+1/64*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)/x*(-32*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4*c^4+8*c^5*x^5+144*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-72*c^3*x^3+120*c*x*arcsin(c*x)^2+128*I*arcsin(c*x)*x*c-128*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*x*c+128*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+33*c*x)*d^2

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))^2}{x^2}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin{(cx)}+a)^2}{x^2}\,dx$$

[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="fricas")

[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4 - 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^2, x)

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^2}\,dx = \int \frac{(-d(cx-1)(cx+1))^{\frac{5}{2}}(a+b\operatorname{asin}(cx))^2}{x^2}\,dx$$

[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/x**2,x)

[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2/x**2, x)

Maxima [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^2}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{x^2}\,dx$$

[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="maxima")

[Out] -1/8*(10*(-c^2*d*x^2 + d)^(3/2)*c^2*d*x + 15*sqrt(-c^2*d*x^2 + d)*c^2*d^2*x + 15*c*d^(5/2)*arcsin(c*x) + 8*(-c^2*d*x^2 + d)^(5/2)/x)*a^2 + sqrt(d)*integrate(((b^2*c^4*d^2*x^4 - 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x^2, x)

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^2}\,dx = \text{Exception raised: TypeError}$$

[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^2,x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\arcsin(cx)\right)^2}{x^2}\,dx=\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2\left(d-c^2\,d\,x^2\right)^{5/2}}{x^2}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x^2,x)
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x^2, x)
```

3.232 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^3}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 740

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^3}\,dx = \frac{40}{9}b^2c^2d^2\sqrt{d-c^2dx^2} + \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} + \frac{2}{27}b^2c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} + \frac{5b^2c^3d^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} - \frac{bcd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{2x^2} + \frac{5c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{b^2c^2d^2\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} - \frac{5ibc^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{5ibc^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{5b^2c^2d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{5b^2c^2d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

```
[Out] -5/6*c^2*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2-1/2*(-c^2*d*x^2+d)^(5/2
)*(a+b*arcsin(c*x))^2/x^2+40/9*b^2*c^2*d^2*(-c^2*d*x^2+d)^(1/2)+2/27*b^2*c^
2*d^2*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)-5/2*c^2*d^2*(a+b*arcsin(c*x))^2*(-c
^2*d*x^2+d)^(1/2)+5*a*b*c^3*d^2*x*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5
*b^2*c^3*d^2*x*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-b*c*d^2*
(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/x/(-c^2*x^2+1)^(1/2)-1/3*b*c^3*d^2*x
*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/9*b*c^5*d^2*x^
3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5*c^2*d^2*(a+b*
arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2
*x^2+1)^(1/2)-b^2*c^2*d^2*arctanh((-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/
(-c^2*x^2+1)^(1/2)+5*I*b*c^2*d^2*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^
2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-5*I*b*c^2*d^2*(a+b*arcs
```

```
in(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^
2+1)^(1/2)+5*b^2*c^2*d^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d
)^(1/2)/(-c^2*x^2+1)^(1/2)-5*b^2*c^2*d^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2)
)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.64 (sec) , antiderivative size = 740, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.690, Rules used = {4785, 4787, 4783, 4803, 4268, 2611, 2320, 6724, 4715, 267, 4739, 455, 45, 276, 4777, 12, 1265, 911, 1167, 214}

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^3}\,dx=\frac{5c^2d^2\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}$$
$$-\frac{5ibc^2d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}$$
$$+\frac{5ibc^2d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}$$
$$-\frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{bcd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}}$$
$$-\frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2-\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{2x^2}$$
$$-\frac{2bc^5d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}-\frac{bc^3d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}$$
$$+\frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\frac{5b^2c^2d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$-\frac{5b^2c^2d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$+\frac{5b^2c^3d^2x\arcsin(cx)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}-\frac{b^2c^2d^2\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}$$
$$+\frac{40}{9}b^2c^2d^2\sqrt{d-c^2dx^2}+\frac{2}{27}b^2c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] (40*b^2*c^2*d^2*Sqrt[d - c^2*d*x^2])/9 + (5*a*b*c^3*d^2*x*Sqrt[d - c^2*d*x^
2])/Sqrt[1 - c^2*x^2] + (2*b^2*c^2*d^2*(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])/2
7 + (5*b^2*c^3*d^2*x*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (
b*c*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[1 - c^2*x^2]) - (b
*c^3*d^2*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) -
 (2*b*c^5*d^2*x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*
x^2]) - (5*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/2 - (5*c^2*d*
```

```
(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/6 - ((d - c^2*d*x^2)^(5/2)*(a
+ b*ArcSin[c*x])^2)/(2*x^2) + (5*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (b^2*c^2*d^2*Sqrt[d
 - c^2*d*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[1 - c^2*x^2] - ((5*I)*b*c^2*
d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])
/Sqrt[1 - c^2*x^2] + ((5*I)*b*c^2*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (5*b^2*c^2*d^2*Sqrt[d
 - c^2*d*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (5*b^2*c^
2*d^2*Sqrt[d - c^2*d*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
```

```
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{2x^2} \\
&\quad -\frac{1}{2}\left(5c^2d\right)\int\frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx \\
&\quad +\frac{\left(bcd^2\sqrt{d-c^2dx^2}\right)\int\frac{\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{x^2}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{bcd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}}-\frac{2bc^3d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} \\
&\quad +\frac{bc^5d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&\quad -\frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{2x^2} \\
&\quad -\frac{1}{2}\left(5c^2d^2\right)\int\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{x}\,dx \\
&\quad -\frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{-3-6c^2x^2+c^4x^4}{3x\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}} \\
&\quad +\frac{\left(5bc^3d^2\sqrt{d-c^2dx^2}\right)\int\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{3\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{bcd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 - \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{2x^2} - \frac{\left(5c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{x\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{-3-6c^2x^2+c^4x^4}{x\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}} + \frac{\left(5bc^3d^2\sqrt{d-c^2dx^2}\right)\int(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(5b^2c^4d^2\sqrt{d-c^2dx^2}\right)\int\frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}}$$

$$= \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} - \frac{bcd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} - \frac{2bc^5d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 - \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{2x^2} - \frac{\left(5c^2d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)^2\csc(x)\,dx,x,\arcsin(cx)\right)}{2\sqrt{1-c^2x^2}} - \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{-3-6c^2x+c^4x^2}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{6\sqrt{1-c^2x^2}} + \frac{\left(5b^2c^3d^2\sqrt{d-c^2dx^2}\right)\int\arcsin(cx)\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(5b^2c^4d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{6\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}}+\frac{5b^2c^3d^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} \\
&\quad -\frac{bcd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}}-\frac{bc^3d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&\quad -\frac{2bc^5d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}-\frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&\quad -\frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{2x^2} \\
&\quad +\frac{5c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad +\frac{\left(b^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\frac{-8+4x^2+x^4}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{3\sqrt{1-c^2x^2}} \\
&\quad +\frac{\left(5bc^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int(a+bx)\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(5bc^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int(a+bx)\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(5b^2c^4d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\left(\frac{2}{3\sqrt{1-c^2x}}+\frac{1}{3}\sqrt{1-c^2x}\right)\,dx,x,x^2\right)}{6\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(5b^2c^4d^2\sqrt{d-c^2dx^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{55}{9}b^2c^2d^2\sqrt{d-c^2dx^2} + \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} \\
&+ \frac{5}{27}b^2c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} + \frac{5b^2c^3d^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} \\
&- \frac{bcd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&- \frac{2bc^5d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&- \frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 - \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{2x^2} \\
&+ \frac{5c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{5ibc^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&+ \frac{5ibc^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&+ \frac{\left(b^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\left(-5c^2-c^2x^2-\frac{3}{\frac{1}{c^2}-\frac{x^2}{c^2}}\right)dx,x,\sqrt{1-c^2x^2}\right)}{3\sqrt{1-c^2x^2}} \\
&+ \frac{\left(5ib^2c^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,-e^{ix}\right)dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{\left(5ib^2c^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,e^{ix}\right)dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{40}{9}b^2c^2d^2\sqrt{d-c^2dx^2} + \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} \\
&+ \frac{2}{27}b^2c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} + \frac{5b^2c^3d^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} \\
&- \frac{bcd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&- \frac{2bc^5d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&- \frac{5}{6}c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2 - \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{2x^2} \\
&+ \frac{5c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{5ibc^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&+ \frac{5ibc^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{\left(b^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} \\
&+ \frac{\left(5b^2c^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{\left(5b^2c^2d^2\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{40}{9}b^2c^2d^2\sqrt{d-c^2dx^2} + \frac{5abc^3d^2x\sqrt{d-c^2dx^2}}{\sqrt{1-c^2x^2}} \\
&+ \frac{2}{27}b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2} + \frac{5b^2c^3d^2x\sqrt{d-c^2dx^2}\arcsin(cx)}{\sqrt{1-c^2x^2}} \\
&- \frac{bcd^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{x\sqrt{1-c^2x^2}} - \frac{bc^3d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&- \frac{2bc^5d^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} - \frac{5}{2}c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&- \frac{5}{6}c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2 - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{2x^2} \\
&+ \frac{5c^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{b^2c^2d^2\sqrt{d-c^2dx^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{5ibc^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&+ \frac{5ibc^2d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&+ \frac{5b^2c^2d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{5b^2c^2d^2\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 7.48 (sec) , antiderivative size = 1073, normalized size of antiderivative = 1.45

$$
\begin{aligned}
&\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^3}\,dx = \sqrt{-d(-1+c^2x^2)}\left(-\frac{7}{3}a^2c^2d^2 - \frac{a^2d^2}{2x^2} + \frac{1}{3}a^2c^4d^2x^2\right) \\
&- \frac{5}{2}a^2c^2d^{5/2}\log(x) \\
&+ \frac{5}{2}a^2c^2d^{5/2}\log\left(d+\sqrt{d}\sqrt{-d(-1+c^2x^2)}\right) - 4abc^2d^2\sqrt{d(1-c^2x^2)}\left(-\frac{cx}{\sqrt{1-c^2x^2}} + \arcsin(cx) + \frac{\arcsin(cx)\,(}{}\right.
\end{aligned}
$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^3,x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*((-7*a^2*c^2*d^2)/3 - (a^2*d^2)/(2*x^2) + (a^2*c^
4*d^2*x^2)/3) - (5*a^2*c^2*d^(5/2)*Log[x])/2 + (5*a^2*c^2*d^(5/2)*Log[d + S
qrt[d]*Sqrt[-(d*(-1 + c^2*x^2))]])/2 - 4*a*b*c^2*d^2*Sqrt[d*(1 - c^2*x^2)]*
(-((c*x)/Sqrt[1 - c^2*x^2]) + ArcSin[c*x] + (ArcSin[c*x]*(Log[1 - E^(I*ArcS
in[c*x])] - Log[1 + E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (I*(PolyLog[2,
```

```
 -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2]) -
 2*b^2*c^2*d^2*Sqrt[d*(1 - c^2*x^2)]*(-2 - (2*c*x*ArcSin[c*x])/Sqrt[1 - c^2
*x^2] + ArcSin[c*x]^2 + (ArcSin[c*x]^2*(Log[1 - E^(I*ArcSin[c*x])] - Log[1
+ E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + ((2*I)*ArcSin[c*x]*(PolyLog[2, -
E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (2
*(-PolyLog[3, -E^(I*ArcSin[c*x])] + PolyLog[3, E^(I*ArcSin[c*x])]))/Sqrt[1
- c^2*x^2]) - (a*b*c^2*d^2*Sqrt[d*(1 - c^2*x^2)]*(-9*c*x + 9*Sqrt[1 - c^2*x
^2]*ArcSin[c*x] + 3*ArcSin[c*x]*Cos[3*ArcSin[c*x]] - Sin[3*ArcSin[c*x]]))/(
18*Sqrt[1 - c^2*x^2]) - (b^2*c^2*d^2*Sqrt[d*(1 - c^2*x^2)]*(27*Sqrt[1 - c^2
*x^2]*(-2 + ArcSin[c*x]^2) + (-2 + 9*ArcSin[c*x]^2)*Cos[3*ArcSin[c*x]] - 6*
ArcSin[c*x]*(9*c*x + Sin[3*ArcSin[c*x]])))/(108*Sqrt[1 - c^2*x^2]) + (a*b*c
^2*d^3*Sqrt[1 - c^2*x^2]*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*
x]/2]^2 - 4*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Log[1 +
E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] + (4*I)*PolyLog[2
, E^(I*ArcSin[c*x])] + ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]
/2]))/(4*Sqrt[d*(1 - c^2*x^2)]) + (b^2*c^2*d^3*Sqrt[1 - c^2*x^2]*(-4*ArcSin
[c*x]*Cot[ArcSin[c*x]/2] - ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^2 - 4*ArcSin[c*
x]^2*Log[1 - E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])
] + 8*Log[Tan[ArcSin[c*x]/2]] - (8*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c
*x])] + (8*I)*ArcSin[c*x]*PolyLog[2, E^(I*ArcSin[c*x])] + 8*PolyLog[3, -E^(
I*ArcSin[c*x])] - 8*PolyLog[3, E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Sec[ArcSi
n[c*x]/2]^2 - 4*ArcSin[c*x]*Tan[ArcSin[c*x]/2]))/(8*Sqrt[d*(1 - c^2*x^2)])
```

Maple [A] (verified)

Time = 0.34 (sec) , antiderivative size = 1326, normalized size of antiderivative = 1.79

method	result	size
default	Expression too large to display	1326
parts	Expression too large to display	1326

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^3,x,method=_RETURNVERBOSE)

[Out] a^2*(-1/2/d/x^2*(-c^2*d*x^2+d)^(7/2)-5/2*c^2*(1/5*(-c^2*d*x^2+d)^(5/2)+d*(1
/3*(-c^2*d*x^2+d)^(3/2)+d*((-c^2*d*x^2+d)^(1/2)-d^(1/2)*ln((2*d+2*d^(1/2)*(
-c^2*d*x^2+d)^(1/2))/x)))))+b^2*(1/216*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*
c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*a
rcsin(c*x)+9*arcsin(c*x)^2-2)*c^2*d^2/(c^2*x^2-1)-9/8*(-d*(c^2*x^2-1))^(1/2
)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))*c^
2*d^2/(c^2*x^2-1)-9/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*
x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*c^2*d^2/(c^2*x^2-1)+1/216*(-d*(c^2
*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(
1/2)*x*c-5*c^2*x^2+1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*c^2*d^2/(c^2*x^2
-1)-1/2*d^2*(c^2*x^2*arcsin(c*x)-2*c*x*(-c^2*x^2+1)^(1/2)-arcsin(c*x))*arcs
in(c*x)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/x^2-1/2*(-d*(c^2*x^2-1))^(1/2)*(
```

```
-c^2*x^2+1)^(1/2)*(5*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-5*arcsin(
c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-10*I*arcsin(c*x)*polylog(2,-I*c*x-(-c
^2*x^2+1)^(1/2))+10*I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-4*arc
tanh(I*c*x+(-c^2*x^2+1)^(1/2))+10*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-10*p
olylog(3,I*c*x+(-c^2*x^2+1)^(1/2)))*c^2*d^2/(c^2*x^2-1))+2*a*b*(1/72*(-d*(c
^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-
c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))*d^2*c^2/(c^2*x^2-1)-9/8*(-d*(c^2*
x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)*d^2*c^2/
(c^2*x^2-1)-9/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)
*(arcsin(c*x)-I)*d^2*c^2/(c^2*x^2-1)+1/72*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x
^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*(-I
+3*arcsin(c*x))*d^2*c^2/(c^2*x^2-1)-1/2*d^2*(c^2*x^2*arcsin(c*x)-c*x*(-c^2*
x^2+1)^(1/2)-arcsin(c*x))*(-d*(c^2*x^2-1))^(1/2)/x^2/(c^2*x^2-1)+5*I*(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^
(1/2))-I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2*x
^2+1)^(1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)))*d^2*c^2/(2*c^2*x^2-2))
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^3}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{x^3}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="fricas
")
```

```
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^3, x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^3}\,dx=\int \frac{(-d(cx-1)(cx+1))^{\frac{5}{2}}(a+b\operatorname{asin}(cx))^2}{x^3}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/x**3,x)
```

```
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2/x**3, x)
```

Maxima [F]

$$\int \frac{(d - c^2dx^2)^{5/2} (a + b \arcsin(cx))^2}{x^3} dx = \int \frac{(-c^2dx^2 + d)^{\frac{5}{2}} (b \arcsin(cx) + a)^2}{x^3} dx$$

[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="maxima")

[Out] 1/6*(15*c^2*d^(5/2)*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x)) - 3*(-c^2*d*x^2 + d)^(5/2)*c^2 - 5*(-c^2*d*x^2 + d)^(3/2)*c^2*d - 15*sqrt(-c^2*d*x^2 + d)*c^2*d^2 - 3*(-c^2*d*x^2 + d)^(7/2)/(d*x^2))*a^2 + sqrt(d)*integrate(((b^2*c^4*d^2*x^4 - 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x^3, x)

Giac [F(-2)]

Exception generated.

$$\int \frac{(d - c^2dx^2)^{5/2} (a + b \arcsin(cx))^2}{x^3} dx = \text{Exception raised: TypeError}$$

[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^3,x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{(d - c^2dx^2)^{5/2} (a + b \arcsin(cx))^2}{x^3} dx = \int \frac{(a + b \operatorname{asin}(c x))^2 (d - c^2 d x^2)^{5/2}}{x^3} dx$$

[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x^3,x)

[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x^3, x)

3.233 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^4} dx$

Optimal result

Integrand size = 29, antiderivative size = 591

$$\begin{aligned}
\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^4} dx = &-\frac{7}{12}b^2c^4d^2x\sqrt{d-c^2dx^2} \\
&-\frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x}+\frac{23b^2c^3d^2\sqrt{d-c^2dx^2}\arcsin(cx)}{12\sqrt{1-c^2x^2}} \\
&-\frac{5bc^5d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&-\frac{7}{3}bc^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&-\frac{bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} \\
&+\frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{7ic^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} \\
&+\frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x} \\
&-\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{3x^3}+\frac{5c^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6b\sqrt{1-c^2x^2}} \\
&-\frac{14bc^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} \\
&+\frac{7ib^2c^3d^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] 5/3*c^2*d*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/x-1/3*(-c^2*d*x^2+d)^(5/
2)*(a+b*arcsin(c*x))^2/x^3-7/12*b^2*c^4*d^2*x*(-c^2*d*x^2+d)^(1/2)-1/3*b^2*
c^2*d^2*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/x-1/3*b*c*d^2*(-c^2*x^2+1)^(3/2)*
```

```
(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/x^2+5/2*c^4*d^2*x*(a+b*arcsin(c*x))^
2*(-c^2*d*x^2+d)^(1/2)+23/12*b^2*c^3*d^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)-5/2*b*c^5*d^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/
(-c^2*x^2+1)^(1/2)+7/3*I*c^3*d^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(
-c^2*x^2+1)^(1/2)+5/6*c^3*d^2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/(-
c^2*x^2+1)^(1/2)-14/3*b*c^3*d^2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^
(1/2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+7/3*I*b^2*c^3*d^2*polylog
(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-7/
3*b*c^3*d^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 591, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.517$, Rules used = {4785, 4741, 4737, 4723, 327, 222, 4773, 4721, 3798, 2221, 2317, 2438, 201, 4775, 283}

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{x^4}\,dx =$$
$$-\frac{bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2}+\frac{5c^2d\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{3x}$$
$$-\frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{3x^3}-\frac{5bc^5d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}$$
$$+\frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{5c^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6b\sqrt{1-c^2x^2}}+\frac{7ic^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin}{3\sqrt{1-c^2x^2}}$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (-7*b^2*c^4*d^2*x*Sqrt[d - c^2*d*x^2])/12 - (b^2*c^2*d^2*(1 - c^2*x^2)*Sqrt
[d - c^2*d*x^2])/(3*x) + (23*b^2*c^3*d^2*Sqrt[d - c^2*d*x^2]*ArcSin[c*x])/(
12*Sqrt[1 - c^2*x^2]) - (5*b*c^5*d^2*x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x]))/(2*Sqrt[1 - c^2*x^2]) - (7*b*c^3*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x]))/3 - (b*c*d^2*(1 - c^2*x^2)^(3/2)*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x]))/(3*x^2) + (5*c^4*d^2*x*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x])^2)/2 + (((7*I)/3)*c^3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^2)/Sqrt[1 - c^2*x^2] + (5*c^2*d*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c
*x])^2)/(3*x) - ((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(3*x^3) + (5*
c^3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*Sqrt[1 - c^2*x^2])
 - (14*b*c^3*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*Ar
cSin[c*x])])/(3*Sqrt[1 - c^2*x^2]) + (((7*I)/3)*b^2*c^3*d^2*Sqrt[d - c^2*d*
x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
```

```
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 283

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^p/(c*(m + 1))), x] - Dist[b*n*(p/(c^n*(m + 1))), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4775

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcSin[c*x
])/(f*(m + 1))), x] + (-Dist[b*c*(d^p/(f*(m + 1))), Int[(f*x)^(m + 1)*(1 -
```

```
c^2*x^2)^(p - 1/2), x], x] - Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m + 2)*
(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x]), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0] && ILtQ[(m + 1)/2, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{3x^3} - \frac{1}{3}(5c^2d)\int\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx + \frac{\left(2bcd^2\sqrt{d-c^2dx^2}\right)\int\frac{(1-c^2x^2)^2(a+b\arcsin(cx))}{x^3}\,dx}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{3x^3} + (5c^4d^2)\int\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx + \frac{\left(b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{(1-c^2x^2)^{3/2}}{x^2}\,dx}{3\sqrt{1-c^2x^2}} - \frac{\left(4bc^3d^2\sqrt{d-\right.}{}$$

$$= -\frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} - \frac{7}{3}bc^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{3x^3} - \frac{\left(4bc^3d^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{x}\,dx}{3\sqrt{1-c^2x^2}} - \frac{\left(10bc^3d^2\sqrt{d-c^2dx^2}\right)\int\frac{a+b\arcsin(cx)}{x}\,dx}{3\sqrt{1-c^2x^2}} + \frac{\left(5c^4d^2\sqrt{d-c^2dx^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^4d^2\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}\,dx}{3\sqrt{1-c^2x^2}} - \frac{\left(b^2c^4d^2\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(5b^2c^4d^2\sqrt{d-c^2dx^2}\right)\int\sqrt{1-c^2x^2}\,dx}{3\sqrt{1-c^2x^2}} - \frac{\left(5bc^5d^2\sqrt{d-c^2dx^2}\right)\int x(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{2}{3}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} - \frac{5bc^5d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{7}{3}bc^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{3x^3} + \frac{5c^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6b\sqrt{1-c^2x^2}} - \frac{\left(4bc^3d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)}{3\sqrt{1-c^2x^2}} - \frac{\left(10bc^3d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)}{3\sqrt{1-c^2x^2}} + \frac{\left(b^2c^4d^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}} - \frac{\left(b^2c^4d^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} + \frac{\left(5b^2c^4d^2\sqrt{d-c^2dx^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{6\sqrt{1-c^2x^2}} + \frac{\left(5b^2c^6d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{7}{12}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} + \frac{2b^2c^3d^2\sqrt{d-c^2dx^2}\arcsin(cx)}{3\sqrt{1-c^2x^2}} - \frac{5bc^5d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{7}{3}bc^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{7ic^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{3x^3} + \frac{5c^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6b\sqrt{1-c^2x^2}} + \frac{\left(8ibc^3d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)}{3\sqrt{1-c^2x^2}} + \frac{\left(20ibc^3d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)}{3\sqrt{1-c^2x^2}} + \frac{\left(5b^2c^4d^2\sqrt{d-c^2dx^2}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}}$$

$$= -\frac{7}{12}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} + \frac{23b^2c^3d^2\sqrt{d-c^2dx^2}\arcsin(cx)}{12\sqrt{1-c^2x^2}} - \frac{5bc^5d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{7}{3}bc^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{7ic^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{3x^3} + \frac{5c^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6b\sqrt{1-c^2x^2}} - \frac{14bc^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} + \frac{\left(4b^2c^3d^2\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3\sqrt{1-c^2x^2}} + \frac{\left(10b^2c^3d^2\sqrt{d-c^2dx^2}\right)\mathrm{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{7}{12}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} + \frac{23b^2c^3d^2\sqrt{d-c^2dx^2}\arcsin(cx)}{12\sqrt{1-c^2x^2}} - \frac{5bc^5d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{7}{3}bc^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{7ic^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{3x^3} + \frac{5c^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6b\sqrt{1-c^2x^2}} - \frac{14bc^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} - \frac{\left(2ib^2c^3d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} - \frac{\left(5ib^2c^3d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{7}{12}b^2c^4d^2x\sqrt{d-c^2dx^2} - \frac{b^2c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}{3x} + \frac{23b^2c^3d^2\sqrt{d-c^2dx^2}\arcsin(cx)}{12\sqrt{1-c^2x^2}} - \frac{5bc^5d^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{7}{3}bc^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{bcd^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3x^2} + \frac{5}{2}c^4d^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{7ic^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}} + \frac{5c^2d(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3x} - \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{3x^3} + \frac{5c^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6b\sqrt{1-c^2x^2}} - \frac{14bc^3d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}} + \frac{7ib^2c^3d^2\sqrt{d-c^2dx^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 3.11 (sec) , antiderivative size = 690, normalized size of antiderivative = 1.17

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^4}\,dx = \frac{d^2\Big(-4abcx\sqrt{d-c^2dx^2}+3abc^3x^3\sqrt{d-c^2dx^2}-6abc^5x^5\sqrt{d-c^2dx}$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/x^4,x]
```

```
[Out] (d^2*(-4*a*b*c*x*Sqrt[d - c^2*d*x^2] + 3*a*b*c^3*x^3*Sqrt[d - c^2*d*x^2] -
6*a*b*c^5*x^5*Sqrt[d - c^2*d*x^2] - 4*a^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*
x^2] + 28*a^2*c^2*x^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] - 4*b^2*c^2*x^2
*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] + 6*a^2*c^4*x^4*Sqrt[1 - c^2*x^2]*Sq
rt[d - c^2*d*x^2] - 3*b^2*c^4*x^4*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2] + 1
0*b^2*c^3*x^3*Sqrt[d - c^2*d*x^2]*ArcSin[c*x]^3 - 30*a^2*c^3*Sqrt[d]*x^3*Sq
rt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))]
- 56*a*b*c^3*x^3*Sqrt[d - c^2*d*x^2]*Log[c*x] + (28*I)*b^2*c^3*x^3*Sqrt[d -
 c^2*d*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])] + b*Sqrt[d - c^2*d*x^2]*ArcSi
n[c*x]*(-4*b*c*x - 6*a*Sqrt[1 - c^2*x^2] + 48*a*c^2*x^2*Sqrt[1 - c^2*x^2] +
 3*b*c^3*x^3*Cos[2*ArcSin[c*x]] - 2*a*Cos[3*ArcSin[c*x]] - 56*b*c^3*x^3*Log
[1 - E^((2*I)*ArcSin[c*x])] + 6*a*c^3*x^3*Sin[2*ArcSin[c*x]]) + b*Sqrt[d -
c^2*d*x^2]*ArcSin[c*x]^2*(30*a*c^3*x^3 + 4*b*((7*I)*c^3*x^3 - Sqrt[1 - c^2*
x^2] + 7*c^2*x^2*Sqrt[1 - c^2*x^2]) + 3*b*c^3*x^3*Sin[2*ArcSin[c*x]])))/(12
*x^3*Sqrt[1 - c^2*x^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2649 vs. 2(541) = 1082.

Time = 0.35 (sec) , antiderivative size = 2650, normalized size of antiderivative = 4.48

method	result	size
default	Expression too large to display	2650
parts	Expression too large to display	2650

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -35*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^2/(c^2*x^2
-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*c^5+7/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d
^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*(-c^2*x^2+1)*arcsin(c*x)*c^4+147
*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^4/(c^2*x^2-1)
*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*c^7-49/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2
/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*arcsin(c*x)*c^6-49/
3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1
```

)*arcsin(c*x)*c^8-21*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^4/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^7+56/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)*c^6+5*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^5+7/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*c^3+21*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x^2/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c-7/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)*c^4-1/3*a^2/d/x^3*(-c^2*d*x^2+d)^(7/2)+4/3*a^2*c^4*x*(-c^2*d*x^2+d)^(5/2)-56/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1)*c^8+71/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*c^6+1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*arcsin(c*x)^2*x^3-1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*c^4*d^2/(c^2*x^2-1)*arcsin(c*x)^2*x-16/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*c^4+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x/(c^2*x^2-1)*c^2+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x^3/(c^2*x^2-1)*arcsin(c*x)^2+5/2*a^2*c^4*d^2*x*(-c^2*d*x^2+d)^(1/2)+5/2*a^2*c^4*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+5/3*a^2*c^4*d*x*(-c^2*d*x^2+d)^(3/2)+4/3*a^2*c^2/d/x*(-c^2*d*x^2+d)^(7/2)-1/12*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/x^3/(c^2*x^2-1)*(12*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4*c^4-6*c^5*x^5+30*c^3*x^3*arcsin(c*x)^2+56*I*arcsin(c*x)*x^3*c^3-56*ln((I*c*x+(-c^2*x^2+1)^(1/2))^2-1)*x^3*c^3+56*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2+3*c^3*x^3-8*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-4*c*x)*d^2-1/4*b^2*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)-5/6*b^2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^3*c^3*d^2-14*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(3*c^2*x^2-3)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+147*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^5/(c^2*x^2-1)*arcsin(c*x)^2*c^8-203*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*arcsin(c*x)^2*c^6+1/2*b^2*(-d*(c^2*x^2-1))^(1/2)*c^5*d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2+14*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(3*c^2*x^2-3)*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+7/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x^3/(c^2*x^2-1)*(-c^2*x^2+1)*c^6+190/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)*x/(c^2*x^2-1)*arcsin(c*x)^2*c^4-23/3*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/x/(c^2*x^2-1)*arcsin(c*x)^2*c^2-5*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/(c^2*x^2-1)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3+14*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(3*c^2*x^2-3)*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)*d^2/(63*c^4*x^4-15*c^2*x^2+1)/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*c^3-14*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(3*c^2*x^2-3)*arcsin(c*x)^2-14*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*c^3*d^2/(3*c^2*x^2-3)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-1/4*b^2*(-d*(c^2*x^2-1))^(1/2)*c^6*d^2/(c^2*x^2-1)*

```
x^3+1/4*b^2*(-d*(c^2*x^2-1))^(1/2)*c^4*d^2/(c^2*x^2-1)*x
```

Fricas [F]

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\arcsin(cx)\right)^2}{x^4}\,dx=\int \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="fricas
")
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/x^4, x)
```

Sympy [F]

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\arcsin(cx)\right)^2}{x^4}\,dx=\int \frac{\left(-d(cx-1)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}{x^4}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/x**4,x)
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2/x**4, x)
```

Maxima [F]

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}\left(a+b\arcsin(cx)\right)^2}{x^4}\,dx=\int \frac{\left(-c^2dx^2+d\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}{x^4}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="maxima
")
[Out] 1/6*(10*(-c^2*d*x^2 + d)^(3/2)*c^4*d*x + 15*sqrt(-c^2*d*x^2 + d)*c^4*d^2*x
+ 15*c^3*d^(5/2)*arcsin(c*x) + 8*(-c^2*d*x^2 + d)^(5/2)*c^2/x - 2*(-c^2*d*x
^2 + d)^(7/2)/(d*x^3))*a^2 + sqrt(d)*integrate(((b^2*c^4*d^2*x^4 - 2*b^2*c^
2*d^2*x^2 + b^2*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*
c^4*d^2*x^4 - 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/x^4, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^4}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{x^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{5/2}}{x^4}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x^4,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/x^4, x)
```

3.234 $\int \frac{x^5(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 400

$$\begin{aligned}\int \frac{x^5(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx &= \frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}}+\frac{298b^2(1-c^2x^2)}{225c^6\sqrt{d-c^2dx^2}}-\frac{76b^2(1-c^2x^2)^2}{675c^6\sqrt{d-c^2dx^2}}\\ &+\frac{2b^2(1-c^2x^2)^3}{125c^6\sqrt{d-c^2dx^2}}+\frac{16b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{15c^5\sqrt{d-c^2dx^2}}\\ &+\frac{8bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c^3\sqrt{d-c^2dx^2}}\\ &+\frac{2bx^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c\sqrt{d-c^2dx^2}}\\ &-\frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^6d}\\ &-\frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4d}\\ &-\frac{x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2d}\end{aligned}$$

```
[Out] 298/225*b^2*(-c^2*x^2+1)/c^6/(-c^2*d*x^2+d)^(1/2)-76/675*b^2*(-c^2*x^2+1)^2
/c^6/(-c^2*d*x^2+d)^(1/2)+2/125*b^2*(-c^2*x^2+1)^3/c^6/(-c^2*d*x^2+d)^(1/2)
+16/15*a*b*x*(-c^2*x^2+1)^(1/2)/c^5/(-c^2*d*x^2+d)^(1/2)+16/15*b^2*x*arcsin
(c*x)*(-c^2*x^2+1)^(1/2)/c^5/(-c^2*d*x^2+d)^(1/2)+8/45*b*x^3*(a+b*arcsin(c*
x))*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+2/25*b*x^5*(a+b*arcsin(c*x)
)*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)-8/15*(a+b*arcsin(c*x))^2*(-c^2*
d*x^2+d)^(1/2)/c^6/d-4/15*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4/
d-1/5*x^4*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2/d
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 400, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.241, Rules used = {4795, 4767, 4715, 267, 4723, 272, 45}

$$\int \frac{x^5(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{2bx^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c\sqrt{d-c^2dx^2}} - \frac{x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2d} - \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^6d} - \frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4d} + \frac{8bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c^3\sqrt{d-c^2dx^2}} + \frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}} + \frac{16b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{15c^5\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)^3}{125c^6\sqrt{d-c^2dx^2}} - \frac{76b^2(1-c^2x^2)^2}{675c^6\sqrt{d-c^2dx^2}} + \frac{298b^2(1-c^2x^2)}{225c^6\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^5*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (16*a*b*x*Sqrt[1 - c^2*x^2])/(15*c^5*Sqrt[d - c^2*d*x^2]) + (298*b^2*(1 - c
^2*x^2))/(225*c^6*Sqrt[d - c^2*d*x^2]) - (76*b^2*(1 - c^2*x^2)^2)/(675*c^6*
Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2)^3)/(125*c^6*Sqrt[d - c^2*d*x^2]
) + (16*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(15*c^5*Sqrt[d - c^2*d*x^2]) +
 (8*b*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(45*c^3*Sqrt[d - c^2*d*x^2
]) + (2*b*x^5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c*Sqrt[d - c^2*d*x
^2]) - (8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^6*d) - (4*x^2*Sq
rt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^4*d) - (x^4*Sqrt[d - c^2*d*x
^2]*(a + b*ArcSin[c*x])^2)/(5*c^2*d)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2d}+\frac{4\int\frac{x^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{5c^2}\\&\quad+\frac{\left(2b\sqrt{1-c^2x^2}\right)\int x^4(a+b\arcsin(cx))\,dx}{5c\sqrt{d-c^2dx^2}}\end{aligned}$$

$$= \frac{2bx^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c\sqrt{d-c^2dx^2}} - \frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4d} - \frac{x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2d} + \frac{8\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{15c^4} - \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\int \frac{x^5}{\sqrt{1-c^2x^2}}\,dx}{25\sqrt{d-c^2dx^2}} + \frac{\left(8b\sqrt{1-c^2x^2}\right)\int x^2(a+b\arcsin(cx))\,dx}{15c^3\sqrt{d-c^2dx^2}}$$

$$= \frac{8bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c^3\sqrt{d-c^2dx^2}} + \frac{2bx^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^6d} - \frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4d} - \frac{x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2d} - \frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{x^2}{\sqrt{1-c^2x}}\,dx, x, x^2\right)}{25\sqrt{d-c^2dx^2}} + \frac{\left(16b\sqrt{1-c^2x^2}\right)\int (a+b\arcsin(cx))\,dx}{15c^5\sqrt{d-c^2dx^2}} - \frac{\left(8b^2\sqrt{1-c^2x^2}\right)\int \frac{x^3}{\sqrt{1-c^2x^2}}\,dx}{45c^2\sqrt{d-c^2dx^2}}$$

$$= \frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}} + \frac{8bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c^3\sqrt{d-c^2dx^2}} + \frac{2bx^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^6d} - \frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4d} - \frac{x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2d} - \frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \left(\frac{1}{c^4\sqrt{1-c^2x}} - \frac{2\sqrt{1-c^2x}}{c^4} + \frac{(1-c^2x)^{3/2}}{c^4}\right)dx, x, x^2\right)}{25\sqrt{d-c^2dx^2}} + \frac{\left(16b^2\sqrt{1-c^2x^2}\right)\int \arcsin(cx)\,dx}{15c^5\sqrt{d-c^2dx^2}} - \frac{\left(4b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{x}{\sqrt{1-c^2x}}\,dx, x, x^2\right)}{45c^2\sqrt{d-c^2dx^2}}$$

$$= \frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)}{25c^6\sqrt{d-c^2dx^2}} - \frac{4b^2(1-c^2x^2)^2}{75c^6\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)^3}{125c^6\sqrt{d-c^2dx^2}} + \frac{16b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{15c^5\sqrt{d-c^2dx^2}} + \frac{8bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c^3\sqrt{d-c^2dx^2}} + \frac{2bx^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^6d} - \frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4d} - \frac{x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2d} - \frac{\left(16b^2\sqrt{1-c^2x^2}\right)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{15c^4\sqrt{d-c^2dx^2}} - \frac{\left(4b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \left(\frac{1}{c^2\sqrt{1-c^2x}} - \frac{\sqrt{1-c^2x}}{c^2}\right)dx, x, x^2\right)}{45c^2\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= \frac{16abx\sqrt{1-c^2x^2}}{15c^5\sqrt{d-c^2dx^2}} + \frac{298b^2(1-c^2x^2)}{225c^6\sqrt{d-c^2dx^2}} - \frac{76b^2(1-c^2x^2)^2}{675c^6\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)^3}{125c^6\sqrt{d-c^2dx^2}} \\
&+ \frac{16b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{15c^5\sqrt{d-c^2dx^2}} + \frac{8bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{45c^3\sqrt{d-c^2dx^2}} \\
&+ \frac{2bx^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^6d} \\
&- \frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4d} - \frac{x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 230, normalized size of antiderivative = 0.58

$$
\int \frac{x^5(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{30abcx\sqrt{1-c^2x^2}(120+20c^2x^2+9c^4x^4)+225a^2(-8+4c^2x^2+c^4x^4+3c^6x^6)-2b^2(-2072+1936c^2x^2+
$$

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (30*a*b*c*x*Sqrt[1 - c^2*x^2]*(120 + 20*c^2*x^2 + 9*c^4*x^4) + 225*a^2*(-8
+ 4*c^2*x^2 + c^4*x^4 + 3*c^6*x^6) - 2*b^2*(-2072 + 1936*c^2*x^2 + 109*c^4*
x^4 + 27*c^6*x^6) + 30*b*(b*c*x*Sqrt[1 - c^2*x^2]*(120 + 20*c^2*x^2 + 9*c^4
*x^4) + 15*a*(-8 + 4*c^2*x^2 + c^4*x^4 + 3*c^6*x^6))*ArcSin[c*x] + 225*b^2*
(-8 + 4*c^2*x^2 + c^4*x^4 + 3*c^6*x^6)*ArcSin[c*x]^2)/(3375*c^6*Sqrt[d - c^
2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.33 (sec) , antiderivative size = 1020, normalized size of antiderivative = 2.55

method	result	size
default	Expression too large to display	1020
parts	Expression too large to display	1020

```
[In] int(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/5*x^4/c^2/d*(-c^2*d*x^2+d)^(1/2)+4/5/c^2*(-1/3*x^2/c^2/d*(-c^2*d*x^
2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2)))+b^2*(5/1728*(-d*(c^2*x^2-1))^(1
/2)*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)*(6*I*arcsin(c*x)+9*arcsin(c*x)
^2-2)/c^6/d/(c^2*x^2-1)-5/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)
^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^6/d/(c^2*x^2-1)-5/16*(-d*
```

```
(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*
I*arcsin(c*x))/c^6/d/(c^2*x^2-1)+5/1728*(-d*(c^2*x^2-1))^(1/2)*(2*I*c*x*(-c
^2*x^2+1)^(1/2)+2*c^2*x^2-1)*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^6/d/(c^
2*x^2-1)+1/4000*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*(25*arcsin(c*x)^2-
2)*cos(6*arcsin(c*x))-1/400*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*arcsin
(c*x)*sin(6*arcsin(c*x))-1/54000*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*(
2475*arcsin(c*x)^2-598)*cos(4*arcsin(c*x))+29/900*(-d*(c^2*x^2-1))^(1/2)/c^
6/d/(c^2*x^2-1)*arcsin(c*x)*sin(4*arcsin(c*x)))+2*a*b*(5/576*(-d*(c^2*x^2-1
))^(1/2)*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)*(I+3*arcsin(c*x))/c^6/d/(
c^2*x^2-1)-5/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)
*(arcsin(c*x)+I)/c^6/d/(c^2*x^2-1)-5/16*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2
+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^6/d/(c^2*x^2-1)+5/576*(-d*(c^2*x
^2-1))^(1/2)*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*(-I+3*arcsin(c*x))/c^
6/d/(c^2*x^2-1)+1/160*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*arcsin(c*x)*
cos(6*arcsin(c*x))-1/800*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*sin(6*arc
sin(c*x))-11/240*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*arcsin(c*x)*cos(4
*arcsin(c*x))+29/1800*(-d*(c^2*x^2-1))^(1/2)/c^6/d/(c^2*x^2-1)*sin(4*arcsin
(c*x)))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 276, normalized size of antiderivative = 0.69

$$\int \frac{x^5(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = -\frac{30\,(9\,abc^5x^5+20\,abc^3x^3+120\,abcx+(9\,b^2c^5x^5+20\,b^2c^3x^3+120\,b^2cx)\arcsin{(cx)})\sqrt{-c^2dx^2+d}\sqrt{-c^2}}{}$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] -1/3375*(30*(9*a*b*c^5*x^5 + 20*a*b*c^3*x^3 + 120*a*b*c*x + (9*b^2*c^5*x^5
+ 20*b^2*c^3*x^3 + 120*b^2*c*x)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*sqrt(-c^2
*x^2 + 1) + (27*(25*a^2 - 2*b^2)*c^6*x^6 + (225*a^2 - 218*b^2)*c^4*x^4 + 4*
(225*a^2 - 968*b^2)*c^2*x^2 + 225*(3*b^2*c^6*x^6 + b^2*c^4*x^4 + 4*b^2*c^2*
x^2 - 8*b^2)*arcsin(c*x)^2 - 1800*a^2 + 4144*b^2 + 450*(3*a*b*c^6*x^6 + a*b
*c^4*x^4 + 4*a*b*c^2*x^2 - 8*a*b)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^8*d
*x^2 - c^6*d)
```

Sympy [F]

$$\int \frac{x^5(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x^5(a+b\,\mathrm{asin}\,(cx))^2}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

[In] integrate(x**5*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)

[Out] Integral(x**5*(a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 365, normalized size of antiderivative = 0.91

$$\begin{aligned}
&\int \frac{x^5(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx \\
&= -\frac{1}{15}\left(\frac{3\sqrt{-c^2dx^2+d}x^4}{c^2d}+\frac{4\sqrt{-c^2dx^2+d}x^2}{c^4d}+\frac{8\sqrt{-c^2dx^2+d}}{c^6d}\right)b^2\arcsin(cx)^2 \\
&\quad -\frac{2}{15}\left(\frac{3\sqrt{-c^2dx^2+d}x^4}{c^2d}+\frac{4\sqrt{-c^2dx^2+d}x^2}{c^4d}+\frac{8\sqrt{-c^2dx^2+d}}{c^6d}\right)ab\arcsin(cx) \\
&\quad -\frac{1}{15}\left(\frac{3\sqrt{-c^2dx^2+d}x^4}{c^2d}+\frac{4\sqrt{-c^2dx^2+d}x^2}{c^4d}+\frac{8\sqrt{-c^2dx^2+d}}{c^6d}\right)a^2 \\
&\quad +\frac{2}{3375}b^2\left(\frac{27\sqrt{-c^2x^2+1}c^2x^4+136\sqrt{-c^2x^2+1}x^2+\frac{2072\sqrt{-c^2x^2+1}}{c^2}}{c^4\sqrt{d}}+\frac{15\,(9\,c^4x^5+20\,c^2x^3+120\,x)\arcsin}{c^5\sqrt{d}}\right. \\
&\quad +\frac{2\,(9\,c^4x^5+20\,c^2x^3+120\,x)ab}{225\,c^5\sqrt{d}}
\end{aligned}$$

[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")

[Out] -1/15*(3*sqrt(-c^2*d*x^2 + d)*x^4/(c^2*d) + 4*sqrt(-c^2*d*x^2 + d)*x^2/(c^4
*d) + 8*sqrt(-c^2*d*x^2 + d)/(c^6*d))*b^2*arcsin(c*x)^2 - 2/15*(3*sqrt(-c^2
*d*x^2 + d)*x^4/(c^2*d) + 4*sqrt(-c^2*d*x^2 + d)*x^2/(c^4*d) + 8*sqrt(-c^2*
d*x^2 + d)/(c^6*d))*a*b*arcsin(c*x) - 1/15*(3*sqrt(-c^2*d*x^2 + d)*x^4/(c^2
*d) + 4*sqrt(-c^2*d*x^2 + d)*x^2/(c^4*d) + 8*sqrt(-c^2*d*x^2 + d)/(c^6*d))*
a^2 + 2/3375*b^2*((27*sqrt(-c^2*x^2 + 1)*c^2*x^4 + 136*sqrt(-c^2*x^2 + 1)*x
^2 + 2072*sqrt(-c^2*x^2 + 1)/c^2)/(c^4*sqrt(d)) + 15*(9*c^4*x^5 + 20*c^2*x^
3 + 120*x)*arcsin(c*x)/(c^5*sqrt(d))) + 2/225*(9*c^4*x^5 + 20*c^2*x^3 + 120
*x)*a*b/(c^5*sqrt(d))

Giac [F(-2)]

Exception generated.

$$\int \frac{x^5(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^5(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x^5\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((x^5*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((x^5*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.235 $\int \frac{x^4(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 337

$$\int \frac{x^4(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{15b^2x(1-c^2x^2)}{64c^4\sqrt{d-c^2dx^2}}+\frac{b^2x^3(1-c^2x^2)}{32c^2\sqrt{d-c^2dx^2}}-\frac{15b^2\sqrt{1-c^2x^2}\arcsin(cx)}{64c^5\sqrt{d-c^2dx^2}}+\frac{3bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c^3\sqrt{d-c^2dx^2}}+\frac{bx^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c\sqrt{d-c^2dx^2}}-\frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^4d}-\frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4c^2d}+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{8bc^5\sqrt{d-c^2dx^2}}$$

```
[Out] 15/64*b^2*x*(-c^2*x^2+1)/c^4/(-c^2*d*x^2+d)^(1/2)+1/32*b^2*x^3*(-c^2*x^2+1)
/c^2/(-c^2*d*x^2+d)^(1/2)-15/64*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^5/(-c^
2*d*x^2+d)^(1/2)+3/8*b*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d
*x^2+d)^(1/2)+1/8*b*x^4*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+
d)^(1/2)+1/8*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^5/(-c^2*d*x^2+d)^(1
/2)-3/8*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4/d-1/4*x^3*(a+b*arcsi
n(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2/d
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 337, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.172, Rules used = {4795, 4737, 4723, 327, 222}

$$\int \frac{x^4(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{bx^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c\sqrt{d-c^2dx^2}} - \frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4c^2d} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{8bc^5\sqrt{d-c^2dx^2}} - \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^4d} + \frac{3bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c^3\sqrt{d-c^2dx^2}} - \frac{15b^2\sqrt{1-c^2x^2}\arcsin(cx)}{64c^5\sqrt{d-c^2dx^2}} + \frac{b^2x^3(1-c^2x^2)}{32c^2\sqrt{d-c^2dx^2}} + \frac{15b^2x(1-c^2x^2)}{64c^4\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (15*b^2*x*(1 - c^2*x^2))/(64*c^4*Sqrt[d - c^2*d*x^2]) + (b^2*x^3*(1 - c^2*x
^2))/(32*c^2*Sqrt[d - c^2*d*x^2]) - (15*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/
(64*c^5*Sqrt[d - c^2*d*x^2]) + (3*b*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
]))/(8*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*
x]))/(8*c*Sqrt[d - c^2*d*x^2]) - (3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])^2)/(8*c^4*d) - (x^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(4*c^2*d)
 + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(8*b*c^5*Sqrt[d - c^2*d*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4c^2d}+\frac{3\int\frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{4c^2} \\
&\quad+\frac{\left(b\sqrt{1-c^2x^2}\right)\int x^3(a+b\arcsin(cx))\,dx}{2c\sqrt{d-c^2dx^2}} \\
&= \frac{bx^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c\sqrt{d-c^2dx^2}}-\frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^4d} \\
&\quad-\frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4c^2d}+\frac{3\int\frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{8c^4} \\
&\quad-\frac{\left(b^2\sqrt{1-c^2x^2}\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{d-c^2dx^2}}+\frac{\left(3b\sqrt{1-c^2x^2}\right)\int x(a+b\arcsin(cx))\,dx}{4c^3\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= \frac{b^2x^3(1-c^2x^2)}{32c^2\sqrt{d-c^2dx^2}} + \frac{3bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c^3\sqrt{d-c^2dx^2}} + \frac{bx^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c\sqrt{d-c^2dx^2}} - \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^4d} - \frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4c^2d} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{8bc^5\sqrt{d-c^2dx^2}} - \frac{\left(3b^2\sqrt{1-c^2x^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}dx}{32c^2\sqrt{d-c^2dx^2}} - \frac{\left(3b^2\sqrt{1-c^2x^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}dx}{8c^2\sqrt{d-c^2dx^2}}$$

$$= \frac{15b^2x(1-c^2x^2)}{64c^4\sqrt{d-c^2dx^2}} + \frac{b^2x^3(1-c^2x^2)}{32c^2\sqrt{d-c^2dx^2}} + \frac{3bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c^3\sqrt{d-c^2dx^2}} + \frac{bx^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c\sqrt{d-c^2dx^2}} - \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^4d} - \frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4c^2d} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{8bc^5\sqrt{d-c^2dx^2}} - \frac{\left(3b^2\sqrt{1-c^2x^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx}{64c^4\sqrt{d-c^2dx^2}} - \frac{\left(3b^2\sqrt{1-c^2x^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx}{16c^4\sqrt{d-c^2dx^2}}$$

$$= \frac{15b^2x(1-c^2x^2)}{64c^4\sqrt{d-c^2dx^2}} + \frac{b^2x^3(1-c^2x^2)}{32c^2\sqrt{d-c^2dx^2}} - \frac{15b^2\sqrt{1-c^2x^2}\arcsin(cx)}{64c^5\sqrt{d-c^2dx^2}} + \frac{3bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c^3\sqrt{d-c^2dx^2}} + \frac{bx^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c\sqrt{d-c^2dx^2}} - \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^4d} - \frac{x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4c^2d} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{8bc^5\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 1.70 (sec) , antiderivative size = 283, normalized size of antiderivative = 0.84

$$\int \frac{x^4(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{32a^2c\sqrt{d}x(-1+c^2x^2)(3+2c^2x^2) - 96a^2\sqrt{d-c^2dx^2}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right) + b^2\sqrt{d}\sqrt{1-c^2x^2}(32\arcsin(c}{}$$

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (32*a^2*c*Sqrt[d]*x*(-1 + c^2*x^2)*(3 + 2*c^2*x^2) - 96*a^2*Sqrt[d - c^2*d*
x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + b^2*Sqrt[
d]*Sqrt[1 - c^2*x^2]*(32*ArcSin[c*x]^3 + 4*ArcSin[c*x]*(-16*Cos[2*ArcSin[c*
x]] + Cos[4*ArcSin[c*x]]) + 32*Sin[2*ArcSin[c*x]] - Sin[4*ArcSin[c*x]] + 8*
```

```
ArcSin[c*x]^2*(-8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])) - 4*a*b*Sqrt[d]
*Sqrt[1 - c^2*x^2]*(16*Cos[2*ArcSin[c*x]] - Cos[4*ArcSin[c*x]] - 4*ArcSin[c
*x]*(6*ArcSin[c*x] - 8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/(256*c^5*
Sqrt[d]*Sqrt[d - c^2*d*x^2])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 721 vs. 2(297) = 594.

Time = 0.23 (sec) , antiderivative size = 722, normalized size of antiderivative = 2.14

method	result
default	$-\frac{a^2x^3\sqrt{-c^2dx^2+d}}{4c^2d}-\frac{3a^2x\sqrt{-c^2dx^2+d}}{8c^4d}+\frac{3a^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8c^4\sqrt{c^2d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{8c^5d(c^2x^2-1)}+\sqrt{-}\right.$
parts	$-\frac{a^2x^3\sqrt{-c^2dx^2+d}}{4c^2d}-\frac{3a^2x\sqrt{-c^2dx^2+d}}{8c^4d}+\frac{3a^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8c^4\sqrt{c^2d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{8c^5d(c^2x^2-1)}+\sqrt{-}\right.$

```
[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*a^2*x^3/c^2/d*(-c^2*d*x^2+d)^(1/2)-3/8*a^2/c^4*x/d*(-c^2*d*x^2+d)^(1/2
)+3/8*a^2/c^4/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^
2*(-1/8*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(
c*x)^3+1/8*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d/(c^2*x^2-1)*arcs
in(c*x)+1/16*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*(2*arcsin(c*x)^2-1)*x
-1/128*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)*cos(5*arcsin(c*
x))-1/512*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*(8*arcsin(c*x)^2-1)*sin(
5*arcsin(c*x))+15/128*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)*
cos(3*arcsin(c*x))+1/512*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*(56*arcsi
n(c*x)^2-31)*sin(3*arcsin(c*x)))+2*a*b*(-3/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*
x^2+1)^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)^2-1/16/c^5/(-d*(c^2*x^2-1))^(1/2
)*(-c^2*x^2+1)^(1/2)+1/8*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*arcsin(c*
x)*x-1/256*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*cos(5*arcsin(c*x))-1/64
*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)*sin(5*arcsin(c*x))+15
/256*(-d*(c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*cos(3*arcsin(c*x))+7/64*(-d*(
c^2*x^2-1))^(1/2)/c^5/d/(c^2*x^2-1)*arcsin(c*x)*sin(3*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^4}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)*sqrt(-c
^2*d*x^2 + d)/(c^2*d*x^2 - d), x)
```

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x^4(a+b\operatorname{asin}(cx))^2}{\sqrt{-d(cx-1)(cx+1)}}\,dx$$

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Maxima [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^4}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] -1/8*a^2*(2*sqrt(-c^2*d*x^2 + d)*x^3/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*x/(c^
4*d) - 3*arcsin(c*x)/(c^5*sqrt(d))) - sqrt(d)*integrate((b^2*x^4*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*x^4*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*d*x^2 - d), x)
```

Giac [F]

$$\int \frac{x^4(a + b \arcsin(cx))^2}{\sqrt{d - c^2dx^2}}\,dx = \int \frac{(b \arcsin(cx) + a)^2 x^4}{\sqrt{-c^2dx^2 + d}}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2*x^4/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a + b \arcsin(cx))^2}{\sqrt{d - c^2dx^2}}\,dx = \int \frac{x^4\,(a + b\,\mathrm{asin}(c\,x))^2}{\sqrt{d - c^2\,d\,x^2}}\,dx$$

```
[In] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
[Out] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.236 $\int \frac{x^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 277

$$\begin{aligned}\int \frac{x^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx &= \frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}+\frac{14b^2(1-c^2x^2)}{9c^4\sqrt{d-c^2dx^2}}\\&\quad-\frac{2b^2(1-c^2x^2)^2}{27c^4\sqrt{d-c^2dx^2}}+\frac{4b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3\sqrt{d-c^2dx^2}}\\&\quad+\frac{2bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c\sqrt{d-c^2dx^2}}\\&\quad-\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d}\\&\quad-\frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2d}\end{aligned}$$

```
[Out] 14/9*b^2*(-c^2*x^2+1)/c^4/(-c^2*d*x^2+d)^(1/2)-2/27*b^2*(-c^2*x^2+1)^2/c^4/
(-c^2*d*x^2+d)^(1/2)+4/3*a*b*x*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+
4/3*b^2*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+2/9*b*x^3
*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)-2/3*(a+b*arcsi
n(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4/d-1/3*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^
2+d)^(1/2)/c^2/d
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.241, Rules used = {4795, 4767, 4715, 267, 4723, 272, 45}

$$\int \frac{x^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2d} + \frac{2bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c\sqrt{d-c^2dx^2}} - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d} + \frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}} + \frac{4b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3\sqrt{d-c^2dx^2}} - \frac{2b^2(1-c^2x^2)^2}{27c^4\sqrt{d-c^2dx^2}} + \frac{14b^2(1-c^2x^2)}{9c^4\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (4*a*b*x*Sqrt[1 - c^2*x^2])/(3*c^3*Sqrt[d - c^2*d*x^2]) + (14*b^2*(1 - c^2*
x^2))/(9*c^4*Sqrt[d - c^2*d*x^2]) - (2*b^2*(1 - c^2*x^2)^2)/(27*c^4*Sqrt[d
- c^2*d*x^2]) + (4*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^3*Sqrt[d - c^2
*d*x^2]) + (2*b*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c*Sqrt[d - c^
2*d*x^2]) - (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^4*d) - (x^2*
Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^2*d)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2d}+\frac{2\int\frac{x(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{3c^2} \\
&\quad+\frac{\left(2b\sqrt{1-c^2x^2}\right)\int x^2(a+b\arcsin(cx))\,dx}{3c\sqrt{d-c^2dx^2}} \\
&= \frac{2bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c\sqrt{d-c^2dx^2}}-\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d} \\
&\quad-\frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2d}-\frac{\left(2b^2\sqrt{1-c^2x^2}\right)\int\frac{x^3}{\sqrt{1-c^2x^2}}\,dx}{9\sqrt{d-c^2dx^2}} \\
&\quad+\frac{\left(4b\sqrt{1-c^2x^2}\right)\int(a+b\arcsin(cx))\,dx}{3c^3\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= \frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}} + \frac{2bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c\sqrt{d-c^2dx^2}} - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d} - \frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2d} - \frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{x}{\sqrt{1-c^2x}}\,dx, x, x^2\right)}{9\sqrt{d-c^2dx^2}} + \frac{\left(4b^2\sqrt{1-c^2x^2}\right)\int \arcsin(cx)\,dx}{3c^3\sqrt{d-c^2dx^2}}$$

$$= \frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}} + \frac{4b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3\sqrt{d-c^2dx^2}} + \frac{2bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c\sqrt{d-c^2dx^2}} - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d} - \frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2d} - \frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \left(\frac{1}{c^2\sqrt{1-c^2x}} - \frac{\sqrt{1-c^2x}}{c^2}\right)dx, x, x^2\right)}{9\sqrt{d-c^2dx^2}} - \frac{\left(4b^2\sqrt{1-c^2x^2}\right)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{3c^2\sqrt{d-c^2dx^2}}$$

$$= \frac{4abx\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}} + \frac{14b^2(1-c^2x^2)}{9c^4\sqrt{d-c^2dx^2}} - \frac{2b^2(1-c^2x^2)^2}{27c^4\sqrt{d-c^2dx^2}} + \frac{4b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3\sqrt{d-c^2dx^2}} + \frac{2bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c\sqrt{d-c^2dx^2}} - \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d} - \frac{x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2d}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 176, normalized size of antiderivative = 0.64

$$\int \frac{x^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{6abcx\sqrt{1-c^2x^2}(6+c^2x^2) + 9a^2(-2+c^2x^2+c^4x^4) - 2b^2(-20+19c^2x^2+c^4x^4) + 6b\big(bcx\sqrt{1-c^2x^2}(6+c}{27c^4\sqrt{d-c^2dx^2}}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (6*a*b*c*x*Sqrt[1 - c^2*x^2]*(6 + c^2*x^2) + 9*a^2*(-2 + c^2*x^2 + c^4*x^4)
 - 2*b^2*(-20 + 19*c^2*x^2 + c^4*x^4) + 6*b*(b*c*x*Sqrt[1 - c^2*x^2]*(6 + c
^2*x^2) + 3*a*(-2 + c^2*x^2 + c^4*x^4))*ArcSin[c*x] + 9*b^2*(-2 + c^2*x^2 +
 c^4*x^4)*ArcSin[c*x]^2)/(27*c^4*Sqrt[d - c^2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.36 (sec) , antiderivative size = 812, normalized size of antiderivative = 2.93

method	result
default	$a^2\left(-\frac{x^2\sqrt{-c^2 d\,x^2+d}}{3c^2 d}-\frac{2\sqrt{-c^2 d\,x^2+d}}{3d\,c^4}\right)+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\left(2c^2x^2-2icx\sqrt{-c^2x^2+1}-1\right)\left(6i\arcsin(cx)+9\arcsin(cx)^2-2\right)}{432c^4 d(c^2x^2-1)}\right.$
parts	$a^2\left(-\frac{x^2\sqrt{-c^2 d\,x^2+d}}{3c^2 d}-\frac{2\sqrt{-c^2 d\,x^2+d}}{3d\,c^4}\right)+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\left(2c^2x^2-2icx\sqrt{-c^2x^2+1}-1\right)\left(6i\arcsin(cx)+9\arcsin(cx)^2-2\right)}{432c^4 d(c^2x^2-1)}\right.$

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/3*x^2/c^2/d*(-c^2*d*x^2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2))+b^
2*(1/432*(-d*(c^2*x^2-1))^(1/2)*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)*(6
*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1
/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/
c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*
x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^4/d/(c^2*x^2-1)+1/432*(-d*(c^2*x
^2-1))^(1/2)*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*(-6*I*arcsin(c*x)+9*a
rcsin(c*x)^2-2)/c^4/d/(c^2*x^2-1)-1/216*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x
^2-1)*(9*arcsin(c*x)^2-2)*cos(4*arcsin(c*x))+1/36*(-d*(c^2*x^2-1))^(1/2)/c^
4/d/(c^2*x^2-1)*arcsin(c*x)*sin(4*arcsin(c*x)))+2*a*b*(1/144*(-d*(c^2*x^2-1
))^(1/2)*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)*(I+3*arcsin(c*x))/c^4/d/(
c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*
(arcsin(c*x)+I)/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1
)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/c^4/d/(c^2*x^2-1)+1/144*(-d*(c^2*x^2
-1))^(1/2)*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*(-I+3*arcsin(c*x))/c^4/
d/(c^2*x^2-1)-1/24*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*arcsin(c*x)*cos
(4*arcsin(c*x))+1/72*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*sin(4*arcsin(
c*x)))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 210, normalized size of antiderivative = 0.76

$$\int \frac{x^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = -\frac{6\left(abc^3x^3+6\,abcx+(b^2c^3x^3+6\,b^2cx)\arcsin{(cx)}\right)\sqrt{-c^2dx^2+d}\sqrt{-c^2x^2+1}+\left((9\,a^2-2\,b^2)c^4x^4+(9\,a\right.}{}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] -1/27*(6*(a*b*c^3*x^3 + 6*a*b*c*x + (b^2*c^3*x^3 + 6*b^2*c*x)*arcsin(c*x))*
sqrt(-c^2*d*x^2 + d)*sqrt(-c^2*x^2 + 1) + ((9*a^2 - 2*b^2)*c^4*x^4 + (9*a^2
 - 38*b^2)*c^2*x^2 + 9*(b^2*c^4*x^4 + b^2*c^2*x^2 - 2*b^2)*arcsin(c*x)^2 -
18*a^2 + 40*b^2 + 18*(a*b*c^4*x^4 + a*b*c^2*x^2 - 2*a*b)*arcsin(c*x))*sqrt(
-c^2*d*x^2 + d))/(c^6*d*x^2 - c^4*d)
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x^3(a+b\,\mathrm{asin}\,(cx))^2}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**3*(a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 251, normalized size of antiderivative = 0.91

$$\begin{aligned}\int \frac{x^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx &= -\frac{1}{3}\,b^2\left(\frac{\sqrt{-c^2dx^2+d}x^2}{c^2d}+\frac{2\sqrt{-c^2dx^2+d}}{c^4d}\right)\arcsin\left(cx\right)^2 \\ &\quad -\frac{2}{3}\,ab\left(\frac{\sqrt{-c^2dx^2+d}x^2}{c^2d}+\frac{2\sqrt{-c^2dx^2+d}}{c^4d}\right)\arcsin\left(cx\right) \\ &\quad -\frac{1}{3}\,a^2\left(\frac{\sqrt{-c^2dx^2+d}x^2}{c^2d}+\frac{2\sqrt{-c^2dx^2+d}}{c^4d}\right) \\ &\quad +\frac{2}{27}\,b^2\left(\frac{\sqrt{-c^2x^2+1}x^2+\frac{20\sqrt{-c^2x^2+1}}{c^2}}{c^2\sqrt{d}}+\frac{3\left(c^2x^3+6\,x\right)\arcsin\left(cx\right)}{c^3\sqrt{d}}\right)+\frac{2\left(c^2x^3+6\,x\right)ab}{9\,c^3\sqrt{d}}\end{aligned}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] -1/3*b^2*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d) + 2*sqrt(-c^2*d*x^2 + d)/(c^4*d)
)*arcsin(c*x)^2 - 2/3*a*b*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d) + 2*sqrt(-c^2*d
*x^2 + d)/(c^4*d))*arcsin(c*x) - 1/3*a^2*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d)
+ 2*sqrt(-c^2*d*x^2 + d)/(c^4*d)) + 2/27*b^2*((sqrt(-c^2*x^2 + 1)*x^2 + 20*
sqrt(-c^2*x^2 + 1)/c^2)/(c^2*sqrt(d)) + 3*(c^2*x^3 + 6*x)*arcsin(c*x)/(c^3*
sqrt(d))) + 2/9*(c^2*x^3 + 6*x)*a*b/(c^3*sqrt(d))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x^3\,(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.237 $\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 206

$$\begin{aligned}\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = {} & \frac{b^2x\sqrt{d-c^2dx^2}}{4c^2d}-\frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d-c^2dx^2}} \\ & +\frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} \\ & -\frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^2d} \\ & +\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] -1/4*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+1/2*b*x^2*
(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/6*(a+b*arcsin
(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^3/(-c^2*d*x^2+d)^(1/2)+1/4*b^2*x*(-c^2*d*x^
2+d)^(1/2)/c^2/d-1/2*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2/d
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 213, normalized size of antiderivative = 1.03, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.172, Rules used

= {4795, 4737, 4723, 327, 222}

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = -\frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^2d} + \frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d-c^2dx^2}} + \frac{b^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (b^2*x*(1 - c^2*x^2))/(4*c^2*Sqrt[d - c^2*d*x^2]) - (b^2*Sqrt[1 - c^2*x^2]*
ArcSin[c*x])/(4*c^3*Sqrt[d - c^2*d*x^2]) + (b*x^2*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/(2*c*Sqrt[d - c^2*d*x^2]) - (x*Sqrt[d - c^2*d*x^2]*(a + b*Arc
Sin[c*x])^2)/(2*c^2*d) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c^3
*Sqrt[d - c^2*d*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^2d}+\frac{\int\frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{2c^2} \\
&\quad+\frac{\left(b\sqrt{1-c^2x^2}\right)\int x(a+b\arcsin(cx))\,dx}{c\sqrt{d-c^2dx^2}} \\
&= \frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}}-\frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^2d} \\
&\quad+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d-c^2dx^2}}-\frac{\left(b^2\sqrt{1-c^2x^2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{d-c^2dx^2}} \\
&= \frac{b^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}}+\frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}}-\frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^2d} \\
&\quad+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d-c^2dx^2}}-\frac{\left(b^2\sqrt{1-c^2x^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{4c^2\sqrt{d-c^2dx^2}} \\
&= \frac{b^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d-c^2dx^2}}+\frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} \\
&\quad-\frac{x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^2d}+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d-c^2dx^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 1.77 (sec) , antiderivative size = 210, normalized size of antiderivative = 1.02

$$\int\frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$$
$$=\frac{12a^2cdx(-1+c^2x^2)-12a^2\sqrt{d}\sqrt{d-c^2dx^2}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right)-6abd\sqrt{1-c^2x^2}(-2\arcsin(cx)^2+\cos(2\,a}{}$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (12*a^2*c*d*x*(-1 + c^2*x^2) - 12*a^2*Sqrt[d]*Sqrt[d - c^2*d*x^2]*ArcTan[(c
*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] - 6*a*b*d*Sqrt[1 - c^2*x^
2]*(-2*ArcSin[c*x]^2 + Cos[2*ArcSin[c*x]] + 2*ArcSin[c*x]*Sin[2*ArcSin[c*x]
]) + b^2*d*Sqrt[1 - c^2*x^2]*(4*ArcSin[c*x]^3 - 6*ArcSin[c*x]*Cos[2*ArcSin[
c*x]] + (3 - 6*ArcSin[c*x]^2)*Sin[2*ArcSin[c*x]]))/(24*c^3*d*Sqrt[d - c^2*d
*x^2])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 516 vs. $2(180) = 360$.

Time = 0.19 (sec) , antiderivative size = 517, normalized size of antiderivative = 2.51

method	result
default	$-\frac{a^2 x\sqrt{-c^2 d\,x^2+d}}{2c^2 d}+\frac{a^2 \arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{2c^2\sqrt{c^2 d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{6c^3 d(c^2x^2-1)}+\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}}{8c^3 d(c^2x^2-1)}\right.$
parts	$-\frac{a^2 x\sqrt{-c^2 d\,x^2+d}}{2c^2 d}+\frac{a^2 \arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{2c^2\sqrt{c^2 d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{6c^3 d(c^2x^2-1)}+\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}}{8c^3 d(c^2x^2-1)}\right.$

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a^2*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2*a^2/c^2/(c^2*d)^(1/2)*arctan((c^2
*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^2*(-1/6*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^
2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^3+1/8*(-d*(c^2*x^2-1))^(1/2)*(-c^2
*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)+1/16*(-d*(c^2*x^2-1))^(1/2)/c^2
/d/(c^2*x^2-1)*(2*arcsin(c*x)^2-1)*x+1/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*
x^2-1)*arcsin(c*x)*cos(3*arcsin(c*x))+1/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^
2*x^2-1)*(2*arcsin(c*x)^2-1)*sin(3*arcsin(c*x)))+2*a*b*(-1/4*(-d*(c^2*x^2-1
))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2-1/16/c^3/(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)+1/8*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x
^2-1)*arcsin(c*x)*x+1/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*cos(3*arc
sin(c*x))+1/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)*sin(3*ar
csin(c*x)))
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2x^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(-c
^2*d*x^2 + d)/(c^2*d*x^2 - d), x)
```

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x^2(a+b\,\mathrm{asin}\,(cx))^2}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral(x**2*(a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Maxima [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
[Out] -1/2*a^2*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*sqrt(d))) - sqr
t(d)*integrate((b^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*
b*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x +
 1)/(c^2*d*x^2 - d), x)
```

Giac [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2*x^2/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
[Out] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.238 $\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 146

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}} + \frac{2b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{c\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2d}$$

```
[Out] 2*b^2*(-c^2*x^2+1)/c^2/(-c^2*d*x^2+d)^(1/2)+2*a*b*x*(-c^2*x^2+1)^(1/2)/c/(-
c^2*d*x^2+d)^(1/2)+2*b^2*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^
(1/2)-(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2/d
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4767, 4715, 267}

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2d} + \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} + \frac{2b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{c\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (2*a*b*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2))
/(c^2*Sqrt[d - c^2*d*x^2]) + (2*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*Sqr
t[d - c^2*d*x^2]) - (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(c^2*d)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2d}+\frac{\left(2b\sqrt{1-c^2x^2}\right)\int(a+b\arcsin(cx))\,dx}{c\sqrt{d-c^2dx^2}}\\
&=\frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2d}+\frac{\left(2b^2\sqrt{1-c^2x^2}\right)\int\arcsin(cx)\,dx}{c\sqrt{d-c^2dx^2}}\\
&=\frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}+\frac{2b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{c\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2d}-\frac{\left(2b^2\sqrt{1-c^2x^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}}\\
&=\frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}+\frac{2b^2(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}}+\frac{2b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{c\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2d}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.59

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{(-1+c^2x^2)\,(a+b\arcsin(cx))^2+2b\sqrt{1-c^2x^2}\left(acx+b\sqrt{1-c^2x^2}+bcx\arcsin(cx)\right)}{c^2\sqrt{d-c^2dx^2}}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] ((-1 + c^2*x^2)*(a + b*ArcSin[c*x])^2 + 2*b*Sqrt[1 - c^2*x^2]*(a*c*x + b*Sq
rt[1 - c^2*x^2] + b*c*x*ArcSin[c*x]))/(c^2*Sqrt[d - c^2*d*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.14 (sec) , antiderivative size = 316, normalized size of antiderivative = 2.16

method	result
default	$-\frac{a^2\sqrt{-c^2d\,x^2+d}}{c^2d}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(c^2x^2-icx\sqrt{-c^2x^2+1}-1\right)\left(\arcsin(cx)^2-2+2i\arcsin(cx)\right)}{2c^2d(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\left(icx\sqrt{-\right.}}{}\right.$
parts	$-\frac{a^2\sqrt{-c^2d\,x^2+d}}{c^2d}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(c^2x^2-icx\sqrt{-c^2x^2+1}-1\right)\left(\arcsin(cx)^2-2+2i\arcsin(cx)\right)}{2c^2d(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\left(icx\sqrt{-\right.}}{}\right.$

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -a^2/c^2/d*(-c^2*d*x^2+d)^(1/2)+b^2*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I
*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/d/(c^2*x^2
-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin
(c*x)^2-2-2*I*arcsin(c*x))/c^2/d/(c^2*x^2-1))+2*a*b*(-1/2*(-d*(c^2*x^2-1))^
(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^2/d/(c^2*x^2-1
)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c
*x)-I)/c^2/d/(c^2*x^2-1))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.01

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = -\frac{2\sqrt{-c^2dx^2+d}(b^2cx\arcsin{(cx)}+abcx)\sqrt{-c^2x^2+1}+\left((a^2-2\,b^2)c^2x^2+(b^2c^2x^2-b^2)\arcsin{(cx)}^2-a^2\right.}{c^4dx^2-c^2d}$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] -(2*sqrt(-c^2*d*x^2 + d)*(b^2*c*x*arcsin(c*x) + a*b*c*x)*sqrt(-c^2*x^2 + 1)
 + ((a^2 - 2*b^2)*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^2 + 2*b^2
 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d))/(c^4*d*x^2 - c^
2*d)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

```
[Out] Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 130, normalized size of antiderivative = 0.89

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = 2\,b^2\left(\frac{x\arcsin{(cx)}}{c\sqrt{d}}+\frac{\sqrt{-c^2x^2+1}}{c^2\sqrt{d}}\right) + \frac{2\,abx}{c\sqrt{d}} - \frac{\sqrt{-c^2dx^2+d}b^2\arcsin{(cx)}^2}{c^2d} - \frac{2\sqrt{-c^2dx^2+d}ab\arcsin{(cx)}}{c^2d} - \frac{\sqrt{-c^2dx^2+d}a^2}{c^2d}$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 2*b^2*(x*arcsin(c*x)/(c*sqrt(d)) + sqrt(-c^2*x^2 + 1)/(c^2*sqrt(d))) + 2*a*
b*x/(c*sqrt(d)) - sqrt(-c^2*d*x^2 + d)*b^2*arcsin(c*x)^2/(c^2*d) - 2*sqrt(-
c^2*d*x^2 + d)*a*b*arcsin(c*x)/(c^2*d) - sqrt(-c^2*d*x^2 + d)*a^2/(c^2*d)
```

Giac [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2*x/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x\,(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
[Out] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.239 $\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 49

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.038, Rules used = {4737}

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/Sqrt[d - c^2*d*x^2],x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d - c^2*d*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral}=\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.45 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.31

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{\sqrt{1-c^2x^2}\arcsin(cx)\left(3a^2+3ab\arcsin(cx)+b^2\arcsin(cx)^2\right)}{3c\sqrt{d-c^2dx^2}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/Sqrt[d - c^2*d*x^2],x]
[Out] (Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(3*a^2 + 3*a*b*ArcSin[c*x] + b^2*ArcSin[c*x]
^2))/(3*c*Sqrt[d - c^2*d*x^2])
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 142 vs. 2(43) = 86.

Time = 0.15 (sec) , antiderivative size = 143, normalized size of antiderivative = 2.92

method	result	size
default	$\frac{a^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}-\frac{b^2\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{3cd(c^2x^2-1)}-\frac{ab\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{cd(c^2x^2-1)}$	143
parts	$\frac{a^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}-\frac{b^2\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{3cd(c^2x^2-1)}-\frac{ab\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{cd(c^2x^2-1)}$	143

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
[Out] a^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/3*b^2*(-d*
(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)^3-a*b*(-d
*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)^2
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*x^2 - d), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral((a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 47, normalized size of antiderivative = 0.96

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{b^2\arcsin(cx)^3}{3\,c\sqrt{d}} + \frac{ab\arcsin(cx)^2}{c\sqrt{d}} + \frac{a^2\arcsin(cx)}{c\sqrt{d}}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
[Out] 1/3*b^2*arcsin(c*x)^3/(c*sqrt(d)) + a*b*arcsin(c*x)^2/(c*sqrt(d)) + a^2*arc
sin(c*x)/(c*sqrt(d))
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^(1/2),x)
[Out] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^(1/2), x)
```

3.240 $\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 257

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx = &-\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\&+\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\&-\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\&-\frac{2b^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\&+\frac{2b^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] -2*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)
/(-c^2*d*x^2+d)^(1/2)+2*I*b*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)
^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2*I*b*(a+b*arcsin(c*x))*pol
ylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2*
b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^
(1/2)+2*b^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*
x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.172, Rules used = {4803, 4268, 2611, 2320, 6724}

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx = & -\frac{2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}} \\ & + \frac{2ib\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}} \\ & - \frac{2ib\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}} \\ & - \frac{2b^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} \\ & + \frac{2b^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] (-2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqr
t[d - c^2*d*x^2] + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2
, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (2*b^
2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] + (
2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
```

```
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int(a+bx)^2\csc(x)\,dx,x,\arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}\\
&= -\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}\\
&= -\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\
&\quad+\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\
&\quad-\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\text{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\text{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= -\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\text{PolyLog}(2,-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\text{PolyLog}(2,x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}$$

$$= -\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.64 (sec) , antiderivative size = 301, normalized size of antiderivative = 1.17

$$\int\frac{(a+b\arcsin(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx = \frac{a^2\log(cx)}{\sqrt{d}} - \frac{a^2\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right)}{\sqrt{d}} + \frac{2ab\sqrt{1-c^2x^2}\left(\arcsin(cx)\left(\log\left(1-e^{i\arcsin(cx)}\right)-\log\left(1+e^{i\arcsin(cx)}\right)\right)+i\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)-i\,\text{Po}\right.}{\sqrt{d-c^2dx^2}} + \frac{b^2\sqrt{1-c^2x^2}\left(\arcsin(cx)^2\log\left(1-e^{i\arcsin(cx)}\right)-\arcsin(cx)^2\log\left(1+e^{i\arcsin(cx)}\right)+2i\arcsin(cx)\,\text{PolyLog}\left(\right.\right.}{\sqrt{}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] (a^2*Log[c*x])/Sqrt[d] - (a^2*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]])/Sqrt[d]
 + (2*a*b*Sqrt[1 - c^2*x^2]*(ArcSin[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[
1 + E^(I*ArcSin[c*x])]) + I*PolyLog[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E
^(I*ArcSin[c*x])]))/Sqrt[d - c^2*d*x^2] + (b^2*Sqrt[1 - c^2*x^2]*(ArcSin[c*
x]^2*Log[1 - E^(I*ArcSin[c*x])] - ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])]
+ (2*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*ArcSin[c*x]*Poly
Log[2, E^(I*ArcSin[c*x])] - 2*PolyLog[3, -E^(I*ArcSin[c*x])] + 2*PolyLog[3,
 E^(I*ArcSin[c*x])]))/Sqrt[d - c^2*d*x^2]
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 387, normalized size of antiderivative = 1.51

method	result
default	$-\frac{a^{2} \ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^{2} d\,x^{2}+d}}{x}\right)}{\sqrt{d}}+\frac{b^{2}\sqrt{-c^{2}x^{2}+1}\,\sqrt{-d\left(c^{2}x^{2}-1\right)}\,\left(\arcsin(cx)^{2}\ln\left(1+icx+\sqrt{-c^{2}x^{2}+1}\right)-\arcsin(cx)^{2}\ln\left(1-icx-\sqrt{-c}\right.\right.}{}$
parts	$-\frac{a^{2} \ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^{2} d\,x^{2}+d}}{x}\right)}{\sqrt{d}}+\frac{b^{2}\sqrt{-c^{2}x^{2}+1}\,\sqrt{-d\left(c^{2}x^{2}-1\right)}\,\left(\arcsin(cx)^{2}\ln\left(1+icx+\sqrt{-c^{2}x^{2}+1}\right)-\arcsin(cx)^{2}\ln\left(1-icx-\sqrt{-c}\right.\right.}{}$

[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)

[Out] -a^2/d^(1/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2)))/d/(c^2*x^2-1)-2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)))/d/(c^2*x^2-1)

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx=\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\sqrt{-c^2dx^2+dx}}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(c^2*d*x^3 - d*x), x)

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx=\int \frac{\left(a+b\operatorname{asin}\left(cx\right)\right)^2}{x\sqrt{-d\left(cx-1\right)\left(cx+1\right)}}\,dx$$

[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**(1/2),x)

[Out] Integral((a + b*asin(c*x))**2/(x*sqrt(-d*(c*x - 1)*(c*x + 1))), x)

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+dx}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -a^2*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/sqrt(d) - sqrt
(d)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arc
tan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*
d*x^3 - d*x), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^(1/2)), x)
```

3.241 $\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 183

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d-c^2dx^2}}\,dx = -\frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{dx} + \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{ib^2c\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}$$

```
[Out] -I*c*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+2*b*c*(a+b
*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/(-c^2*d
*x^2+d)^(1/2)-I*b^2*c*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^
(1/2)/(-c^2*d*x^2+d)^(1/2)-(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/d/x
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used

$= \{4771, 4721, 3798, 2221, 2317, 2438\}$

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{dx} - \frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}} + \frac{2bc\sqrt{1-c^2x^2}\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}} - \frac{ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] ((-I)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2] - (Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(d*x) + (2*b*c*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (I*
b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[d - c^2*d*x
^2]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{dx}+\frac{\left(2bc\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{x}\,dx}{\sqrt{d-c^2dx^2}}\\
&= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{dx}+\frac{\left(2bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}\\
&= -\frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{dx}\\
&\quad-\frac{\left(4ibc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}\\
&= -\frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{dx}\\
&\quad+\frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(2b^2c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}\\
&= -\frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{dx}\\
&\quad+\frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(ib^2c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= -\frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{dx} + \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{ib^2c\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.69 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.87

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{1-c^2x^2}\left(b^2\left(icx+\sqrt{1-c^2x^2}\right)\arcsin(cx)^2+2b\arcsin(cx)\left(a\sqrt{1-c^2x^2}-bcx\log\left(1-e^{2i\arcsin(cx)}\right)\right)+a\right.}{x\sqrt{d-c^2dx^2}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -((Sqrt[1 - c^2*x^2]*(b^2*(I*c*x + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*b*A
rcSin[c*x]*(a*Sqrt[1 - c^2*x^2] - b*c*x*Log[1 - E^((2*I)*ArcSin[c*x])]) + a
*(a*Sqrt[1 - c^2*x^2] - 2*b*c*x*Log[c*x]) + I*b^2*c*x*PolyLog[2, E^((2*I)*A
rcSin[c*x])]))/(x*Sqrt[d - c^2*d*x^2]))
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 426 vs. 2(187) = 374.

Time = 0.21 (sec) , antiderivative size = 427, normalized size of antiderivative = 2.33

method	result
default	$-\frac{a^2\sqrt{-c^2dx^2+d}}{dx}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(icx\sqrt{-c^2x^2+1}+c^2x^2-1\right)\arcsin(cx)^2}{(c^2x^2-1)xd}+\frac{2i\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\left(i\arcsin(cx)\ln(\right.}{}\right.$
parts	$-\frac{a^2\sqrt{-c^2dx^2+d}}{dx}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(icx\sqrt{-c^2x^2+1}+c^2x^2-1\right)\arcsin(cx)^2}{(c^2x^2-1)xd}+\frac{2i\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\left(i\arcsin(cx)\ln(\right.}{}\right.$

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -a^2/d/x*(-c^2*d*x^2+d)^(1/2)+b^2*(-(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^
(1/2)*x*c+c^2*x^2-1)*arcsin(c*x)^2/(c^2*x^2-1)/x/d+2*I*(-c^2*x^2+1)^(1/2)*(
-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^
(1/2))+I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+arcsin(c*x)^2+polylog(2
```

```
,-I*c*x-(-c^2*x^2+1)^(1/2))+polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)))*c)+2*a*b*(
2*I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*c-(
-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*arcsin(c*x)/(c^2
*x^2-1)/x/d-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d/(c^2*x^2-1)*ln((I*c
*x+(-c^2*x^2+1)^(1/2))^2-1)*c)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2}{\sqrt{-c^2dx^2+dx^2}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*x^4 - d*x^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{(a+b\,\mathrm{asin}{(cx)})^2}{x^2\sqrt{-d(cx-1)(cx+1)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral((a + b*asin(c*x))**2/(x**2*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2}{\sqrt{-c^2dx^2+dx^2}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
[Out] -((-1)^(-2*c^2*d*x^2 + 2*d)*sqrt(d)*log(-2*c^2*d + 2*d/x^2) + sqrt(d)*log(x
^2 - 1/c^2))*a*b*c/d + b^2*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))^2/(sqrt(c*x + 1)*sqrt(-c*x + 1)*x^2), x)/sqrt(d) - 2*sqrt(-c^2*d*x^2 +
 d)*a*b*arcsin(c*x)/(d*x) - sqrt(-c^2*d*x^2 + d)*a^2/(d*x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^2\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^(1/2)), x)
```

3.242 $\int \frac{(a+b\arcsin(cx))^2}{x^3\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 402

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^3\sqrt{d-c^2dx^2}}\,dx =& -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2dx^2}\\&-\frac{c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\&-\frac{b^2c^2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{d-c^2dx^2}}\\&+\frac{ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\&-\frac{ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\&-\frac{b^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\&+\frac{b^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] -b*c*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/x/(-c^2*d*x^2+d)^(1/2)-c^2*(a+b*a
rcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*
x^2+d)^(1/2)-b^2*c^2*arctanh((-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d
*x^2+d)^(1/2)+I*b*c^2*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2)
)*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-I*b*c^2*(a+b*arcsin(c*x))*polylog
(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-b^2*c^
2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1
/2)+b^2*c^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(-c^2*d*
x^2+d)^(1/2)-1/2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/d/x^2
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 402, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {4789, 4803, 4268, 2611, 2320, 6724, 4723, 272, 65, 214}

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^3\sqrt{d-c^2dx^2}}\,dx = &-\frac{c^2\sqrt{1-c^2x^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\\ &+\frac{ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\\ &-\frac{ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\\ &-\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x\sqrt{d-c^2dx^2}}\\ &-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2dx^2}\\ &-\frac{b^2c^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\ &+\frac{b^2c^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}\\ &-\frac{b^2c^2\sqrt{1-c^2x^2}\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -((b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(x*Sqrt[d - c^2*d*x^2])) - (S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2*d*x^2) - (c^2*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (
b^2*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/Sqrt[d - c^2*d*x^2] +
 (I*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x
])])/Sqrt[d - c^2*d*x^2] - (I*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*P
olyLog[2, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] - (b^2*c^2*Sqrt[1 - c^2*x
^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2] + (b^2*c^2*Sqrt[1 -
 c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
```

```
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2dx^2}+\frac{1}{2}c^2\int\frac{(a+b\arcsin(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx \\
&\quad+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{x^2}\,dx}{\sqrt{d-c^2dx^2}} \\
&= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2dx^2} \\
&\quad+\frac{\left(c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)^2\csc(x)\,dx,x,\arcsin(cx)\right)}{2\sqrt{d-c^2dx^2}} \\
&\quad+\frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\int\frac{1}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{d-c^2dx^2}} \\
&= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x\sqrt{d-c^2dx^2}}-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2dx^2} \\
&\quad-\frac{c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} \\
&\quad-\frac{\left(bc^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{d-c^2dx^2}} \\
&\quad+\frac{\left(bc^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{d-c^2dx^2}} \\
&\quad+\frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2dx^2} - \frac{c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{\left(b^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{\sqrt{d-c^2dx^2}} - \frac{\left(ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \operatorname{PolyLog}\left(2,-e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{\sqrt{d-c^2dx^2}} + \frac{\left(ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \operatorname{PolyLog}\left(2,e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2dx^2} - \frac{c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{b^2c^2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{d-c^2dx^2}} + \frac{ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} - \frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{x\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2dx^2}$$
$$- \frac{c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}$$
$$- \frac{b^2c^2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{\sqrt{d-c^2dx^2}}$$
$$+ \frac{ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}$$
$$- \frac{ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}$$
$$- \frac{b^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}} + \frac{b^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 4.39 (sec) , antiderivative size = 487, normalized size of antiderivative = 1.21

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{-\frac{4a^2\sqrt{d-c^2dx^2}}{x^2} + 4a^2c^2\sqrt{d}\log(x) - 4a^2c^2\sqrt{d}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right) + \frac{2abc^2d^2(1-c^2x^2)^{3/2}\left(-2\cot\left(\frac{1}{2}\arcsin(cx)\right)-\operatorname{arcs}\right.}{}}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] ((-4*a^2*Sqrt[d - c^2*d*x^2])/x^2 + 4*a^2*c^2*Sqrt[d]*Log[x] - 4*a^2*c^2*Sq
rt[d]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + (2*a*b*c^2*d^2*(1 - c^2*x^2)^(
3/2)*(-2*Cot[ArcSin[c*x]/2] - ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 + 4*ArcSin[c
*x]*Log[1 - E^(I*ArcSin[c*x])] - 4*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] +
 (4*I)*PolyLog[2, -E^(I*ArcSin[c*x])] - (4*I)*PolyLog[2, E^(I*ArcSin[c*x])]
 + ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 - 2*Tan[ArcSin[c*x]/2]))/(d - c^2*d*x^2
)^(3/2) + (b^2*c^2*d^2*(1 - c^2*x^2)^(3/2)*(-4*ArcSin[c*x]*Cot[ArcSin[c*x]/
2] - ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^2 + 4*ArcSin[c*x]^2*Log[1 - E^(I*ArcS
in[c*x])] - 4*ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] + 8*Log[Tan[ArcSin[c
*x]/2]] + (8*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] - (8*I)*ArcSin[c
*x]*PolyLog[2, E^(I*ArcSin[c*x])] - 8*PolyLog[3, -E^(I*ArcSin[c*x])] + 8*Po
lyLog[3, E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Sec[ArcSin[c*x]/2]^2 - 4*ArcSin
[c*x]*Tan[ArcSin[c*x]/2]))/(d - c^2*d*x^2)^(3/2))/(8*d)
```

Maple [A] (verified)

Time = 0.25 (sec) , antiderivative size = 585, normalized size of antiderivative = 1.46

method	result
default	$-\frac{a^2\sqrt{-c^2 d\,x^2+d}}{2d\,x^2}-\frac{a^2 c^2 \ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2 d\,x^2+d}}{x}\right)}{2\sqrt{d}}+b^2\left(-\frac{\left(c^2 x^2 \arcsin(cx)-2cx\sqrt{-c^2x^2+1}-\arcsin(cx)\right)\arcsin(cx)\sqrt{-d(c^2}{2x^2 d(c^2x^2-1)}\right.$
parts	$-\frac{a^2\sqrt{-c^2 d\,x^2+d}}{2d\,x^2}-\frac{a^2 c^2 \ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2 d\,x^2+d}}{x}\right)}{2\sqrt{d}}+b^2\left(-\frac{\left(c^2 x^2 \arcsin(cx)-2cx\sqrt{-c^2x^2+1}-\arcsin(cx)\right)\arcsin(cx)\sqrt{-d(c^2}{2x^2 d(c^2x^2-1)}\right.$

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a^2/d/x^2*(-c^2*d*x^2+d)^(1/2)-1/2*a^2*c^2/d^(1/2)*ln((2*d+2*d^(1/2)*(
-c^2*d*x^2+d)^(1/2))/x)+b^2*(-1/2*(c^2*x^2*arcsin(c*x)-2*c*x*(-c^2*x^2+1)^(
1/2)-arcsin(c*x))*arcsin(c*x)*(-d*(c^2*x^2-1))^(1/2)/x^2/d/(c^2*x^2-1)+1/2*
(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*(arcsin(c*x)^2*ln(1
+I*c*x+(-c^2*x^2+1)^(1/2))-arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I
*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*polylog(2
,I*c*x+(-c^2*x^2+1)^(1/2))+2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2*polylog
(3,I*c*x+(-c^2*x^2+1)^(1/2))+4*arctanh(I*c*x+(-c^2*x^2+1)^(1/2)))*c^2)+2*a*
b*(-1/2*(c^2*x^2*arcsin(c*x)-c*x*(-c^2*x^2+1)^(1/2)-arcsin(c*x))*(-d*(c^2*x
^2-1))^(1/2)/x^2/d/(c^2*x^2-1)-1/2*I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1
/2)/d/(c^2*x^2-1)*(I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-I*arcsin(c*
x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+polyl
og(2,-I*c*x-(-c^2*x^2+1)^(1/2)))*c^2)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*x^5 - d*x^3), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\sqrt{d-c^2dx^2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{x^3\sqrt{-d(cx-1)(cx+1)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral((a + b*asin(c*x))**2/(x**3*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}\,x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
[Out] -1/2*(c^2*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/sqrt(d) +
 sqrt(-c^2*d*x^2 + d)/(d*x^2))*a^2 - sqrt(d)*integrate((b^2*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
+ 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*d*x^5 - d*x^3), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\sqrt{d-c^2dx^2}}\,dx=\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{x^3\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^(1/2)),x)
[Out] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^(1/2)), x)
```

3.243 $\int \frac{(a+b\arcsin(cx))^2}{x^4\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 319

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^4\sqrt{d-c^2dx^2}}\,dx =& -\frac{b^2c^2(1-c^2x^2)}{3x\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2\sqrt{d-c^2dx^2}}\\&-\frac{2ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3\sqrt{d-c^2dx^2}}\\&-\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx^3}\\&-\frac{2c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx}\\&+\frac{4bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{d-c^2dx^2}}\\&-\frac{2ib^2c^3\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] -1/3*b^2*c^2*(-c^2*x^2+1)/x/(-c^2*d*x^2+d)^(1/2)-1/3*b*c*(a+b*arcsin(c*x))*
(-c^2*x^2+1)^(1/2)/x^2/(-c^2*d*x^2+d)^(1/2)-2/3*I*c^3*(a+b*arcsin(c*x))^2*(
-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+4/3*b*c^3*(a+b*arcsin(c*x))*ln(1-(I*
c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2/3*I*b^
2*c^3*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/(-c^2*d*x^
2+d)^(1/2)-1/3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/d/x^3-2/3*c^2*(a+b*
arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/d/x
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 319, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.310, Rules used = {4789, 4771, 4721, 3798, 2221, 2317, 2438, 4723, 270}

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\sqrt{d-c^2dx^2}}\,dx = -\frac{2c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx^3} - \frac{2ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3\sqrt{d-c^2dx^2}} + \frac{4bc^3\sqrt{1-c^2x^2}\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3\sqrt{d-c^2dx^2}} - \frac{2ib^2c^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3\sqrt{d-c^2dx^2}} - \frac{b^2c^2(1-c^2x^2)}{3x\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -1/3*(b^2*c^2*(1 - c^2*x^2))/(x*Sqrt[d - c^2*d*x^2]) - (b*c*Sqrt[1 - c^2*x^
2]*(a + b*ArcSin[c*x]))/(3*x^2*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*c^3*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2] - (Sqrt[d - c^2*d*x^
2]*(a + b*ArcSin[c*x])^2)/(3*d*x^3) - (2*c^2*Sqrt[d - c^2*d*x^2]*(a + b*Arc
Sin[c*x])^2)/(3*d*x) + (4*b*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1
 - E^((2*I)*ArcSin[c*x])])/(3*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*b^2*c^3*Sqr
t[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[d - c^2*d*x^2]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx^3} + \frac{1}{3}(2c^2)\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d-c^2dx^2}}\,dx + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{x^3}\,dx}{3\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx^3} - \frac{2c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx} + \frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\int \frac{1}{x^2\sqrt{1-c^2x^2}}\,dx}{3\sqrt{d-c^2dx^2}} + \frac{\left(4bc^3\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{x}\,dx}{3\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3x\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx^3} - \frac{2c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx} + \frac{\left(4bc^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \arcsin(cx)\right)}{3\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3x\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2\sqrt{d-c^2dx^2}} - \frac{2ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx^3} - \frac{2c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx} - \frac{\left(8ibc^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)}{3\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3x\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2\sqrt{d-c^2dx^2}} - \frac{2ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx^3} - \frac{2c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx} + \frac{4bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{d-c^2dx^2}} - \frac{\left(4b^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{3\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3x\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2\sqrt{d-c^2dx^2}} - \frac{2ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx^3} - \frac{2c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx} + \frac{4bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{d-c^2dx^2}} + \frac{\left(2ib^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{3\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3x\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3x^2\sqrt{d-c^2dx^2}} - \frac{2ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3\sqrt{d-c^2dx^2}} - \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx^3} - \frac{2c^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3dx} + \frac{4bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{3\sqrt{d-c^2dx^2}} - \frac{2ib^2c^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)}{3\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.76 (sec) , antiderivative size = 269, normalized size of antiderivative = 0.84

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\sqrt{d-c^2dx^2}}\,dx = -\frac{\sqrt{1-c^2x^2}\left(abcx + a^2\sqrt{1-c^2x^2} + 2a^2c^2x^2\sqrt{1-c^2x^2} + b^2c^2x^2\sqrt{1-c^2x^2} + b^2\left(2ic^3x^3 + \sqrt{1-c^2x^2} + 2c^2\right.\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*Sqrt[d - c^2*d*x^2]),x]
```

```
[Out] -1/3*(Sqrt[1 - c^2*x^2]*(a*b*c*x + a^2*Sqrt[1 - c^2*x^2] + 2*a^2*c^2*x^2*Sq
rt[1 - c^2*x^2] + b^2*c^2*x^2*Sqrt[1 - c^2*x^2] + b^2*((2*I)*c^3*x^3 + Sqrt
[1 - c^2*x^2] + 2*c^2*x^2*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 - b*ArcSin[c*x]*
(-(b*c*x) - 2*a*Sqrt[1 - c^2*x^2]*(1 + 2*c^2*x^2) + 4*b*c^3*x^3*Log[1 - E^(
(2*I)*ArcSin[c*x])]) - 4*a*b*c^3*x^3*Log[c*x] + (2*I)*b^2*c^3*x^3*PolyLog[2
, E^((2*I)*ArcSin[c*x])]))/(x^3*Sqrt[d - c^2*d*x^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2318 vs. 2(301) = 602.

Time = 0.26 (sec) , antiderivative size = 2319, normalized size of antiderivative = 7.27

method	result	size
default	Expression too large to display	2319
parts	Expression too large to display	2319

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*(-c^2*x^2+1
)*arcsin(c*x)*c^6-2*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*
x^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*c^5-2/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(
3*c^4*x^4-2*c^2*x^2-1)/d*x*(-c^2*x^2+1)*arcsin(c*x)*c^4+a*b*(-d*(c^2*x^2-1)
)^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*c^3*(-c^2*x^2+1)^(1/2)+2/3*a*b*(-d*(c^2*x
^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x^3*arcsin(c*x)+4/3*b^2*(-d*(c^2*x^2
-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x*arcsin(c*x)^2*c^2-1/3*I*b^2*(-d*(c^2
*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*(-c^2*x^2+1)^(1/2)*c^3-1/3*b^2*(-d
*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*c^6+1/3*b^2*(-d*(c^2*x^2-
1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x^3*arcsin(c*x)^2-2/3*b^2*(-d*(c^2*x^2-
1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^5*c^8+a^2*(-1/3/d/x^3*(-c^2*d*x^2+d)^
(1/2)-2/3*c^2/d/x*(-c^2*d*x^2+d)^(1/2))-4*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c
^4*x^4-2*c^2*x^2-1)/d*x^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5-4/3*I*a*b*(-d*
(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*(-c^2*x^2+1)*c^6-2/3*I*a*b
*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*(-c^2*x^2+1)*c^4+8/3*I*
a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*arcsin(c*x)*c^3
-2/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*(-c^2*x^2+1)^(1
/2)*arcsin(c*x)^2*c^3-4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2
-1)/d*x^5*arcsin(c*x)*c^8+2/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2
*x^2-1)/d*x^3*arcsin(c*x)*c^6-I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2
*x^2-1)/d*x^2*(-c^2*x^2+1)^(1/2)*c^5+2/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^
4*x^4-2*c^2*x^2-1)/d*x*arcsin(c*x)*c^4+4/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^
2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^3*arcsin(c*x)^2+4/3*I*b^2*(-c^2*x^2+1)^(1/2
)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1
/2))+2/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*c^4+2/3*I
*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*c^6-4*a*b*(-d*(c^
2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*arcsin(c*x)*c^6+2/3*a*b*(-d*(
c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*arcsin(c*x)*c^4+8/3*a*b*(-d*(
c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x*arcsin(c*x)*c^2+1/3*a*b*(-d*(
c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x^2*(-c^2*x^2+1)^(1/2)*c-4/3*a*
b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*ln((I*c*x+(-c^2*x
^2+1)^(1/2))^2-1)*c^3-4/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2
-1)/d*x^5*c^8+2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*c^
```

```
4+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x*c^2-2/3*b^2*(-
d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*(-c^2*x^2+1)*c^6+b^2*(-d
*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*(-c^2*x^2+1)^(1/2)*arcsin(c*x
)*c^3-2*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x^3*arcsin(c*x
)^2*c^6+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*x*arcsin(c
*x)^2*c^4-4/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d*(-c^2*
x^2+1)^(1/2)*arcsin(c*x)*c^3+4/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^
(1/2)/d/(c^2*x^2-1)*c^3*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-4/3*b^2*(-c^2*x
^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c^2*x^2-1)*c^3*arcsin(c*x)*ln(1+I*c*x
+(-c^2*x^2+1)^(1/2))-4/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d/(c
^2*x^2-1)*c^3*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+1/3*b^2*(-d*(c^2*x
^2-1))^(1/2)/(3*c^4*x^4-2*c^2*x^2-1)/d/x^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^2*d*x^6 - d*x^4), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\sqrt{d-c^2dx^2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{x^4\sqrt{-d(cx-1)(cx+1)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral((a + b*asin(c*x))**2/(x**4*sqrt(-d*(c*x - 1)*(c*x + 1))), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
```

```
[Out] 1/3*(4*c^2*log(x)/sqrt(d) - 1/(sqrt(d)*x^2))*a*b*c - 2/3*a*b*(2*sqrt(-c^2*d
*x^2 + d)*c^2/(d*x) + sqrt(-c^2*d*x^2 + d)/(d*x^3))*arcsin(c*x) - 1/3*a^2*(
2*sqrt(-c^2*d*x^2 + d)*c^2/(d*x) + sqrt(-c^2*d*x^2 + d)/(d*x^3)) + b^2*inte
grate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/(sqrt(c*x + 1)*sqrt(-c*x
 + 1)*x^4), x)/sqrt(d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\sqrt{d-c^2dx^2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^4\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^(1/2)), x)
```

3.244 $\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 549

$$\begin{aligned}\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= -\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}}-\frac{32b^2(1-c^2x^2)}{9c^6d\sqrt{d-c^2dx^2}}\\ &+\frac{2b^2(1-c^2x^2)^2}{27c^6d\sqrt{d-c^2dx^2}}-\frac{16b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{3c^5d\sqrt{d-c^2dx^2}}+\frac{2bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d\sqrt{d-c^2dx^2}}\\ &-\frac{2bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d\sqrt{d-c^2dx^2}}+\frac{x^4(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}\\ &+\frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^6d^2}+\frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d^2}\\ &+\frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}\\ &-\frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}\\ &+\frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] -32/9*b^2*(-c^2*x^2+1)/c^6/d/(-c^2*d*x^2+d)^(1/2)+2/27*b^2*(-c^2*x^2+1)^2/c
^6/d/(-c^2*d*x^2+d)^(1/2)+x^4*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2
)-16/3*a*b*x*(-c^2*x^2+1)^(1/2)/c^5/d/(-c^2*d*x^2+d)^(1/2)-16/3*b^2*x*arcsi
n(c*x)*(-c^2*x^2+1)^(1/2)/c^5/d/(-c^2*d*x^2+d)^(1/2)+2*b*x*(a+b*arcsin(c*x)
)*(-c^2*x^2+1)^(1/2)/c^5/d/(-c^2*d*x^2+d)^(1/2)-2/9*b*x^3*(a+b*arcsin(c*x))
*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)+4*I*b*(a+b*arcsin(c*x))*arct
an(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^6/d/(-c^2*d*x^2+d)^(1/2)-
2*I*b^2*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^6/d/(
-c^2*d*x^2+d)^(1/2)+2*I*b^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x
```

```
^2+1)^(1/2)/c^6/d/(-c^2*d*x^2+d)^(1/2)+8/3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+
d)^(1/2)/c^6/d^2+4/3*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4/d^2
```

Rubi [A] (verified)

Time = 0.49 (sec) , antiderivative size = 549, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.414$, Rules used = {4791, 4795, 4767, 4715, 267, 4723, 272, 45, 4749, 4266, 2317, 2438}

$$\begin{aligned}\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = &\frac{4ib\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^6d\sqrt{d-c^2dx^2}}\\ &+\frac{x^4(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}+\frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^6d^2}\\ &+\frac{2bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d\sqrt{d-c^2dx^2}}+\frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d^2}\\ &-\frac{2bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d\sqrt{d-c^2dx^2}}-\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}}\\ &-\frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}\\ &+\frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}\\ &-\frac{16b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{3c^5d\sqrt{d-c^2dx^2}}+\frac{2b^2(1-c^2x^2)^2}{27c^6d\sqrt{d-c^2dx^2}}-\frac{32b^2(1-c^2x^2)}{9c^6d\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[In] Int[(x^5*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (-16*a*b*x*Sqrt[1 - c^2*x^2])/(3*c^5*d*Sqrt[d - c^2*d*x^2]) - (32*b^2*(1 -
c^2*x^2))/(9*c^6*d*Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2)^2)/(27*c^6*d
*Sqrt[d - c^2*d*x^2]) - (16*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^5*d*S
qrt[d - c^2*d*x^2]) + (2*b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c^5*d*
Sqrt[d - c^2*d*x^2]) - (2*b*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c
^3*d*Sqrt[d - c^2*d*x^2]) + (x^4*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d - c^2
*d*x^2]) + (8*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^6*d^2) + (4*x
^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^4*d^2) + ((4*I)*b*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^6*d*Sqrt[d -
c^2*d*x^2]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)])/(c^6*d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I
*E^(I*ArcSin[c*x])])/(c^6*d*Sqrt[d - c^2*d*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = \frac{x^4(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{4\int \frac{x^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^4(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$=\frac{2bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3d\sqrt{d-c^2dx^2}}+\frac{x^4(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}+\frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d^2}-\frac{8\int\frac{x(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}dx}{3c^4d}-\frac{\left(2b\sqrt{1-c^2x^2}\right)\int\frac{x^2(a+b\arcsin(cx))}{1-c^2x^2}dx}{c^3d\sqrt{d-c^2dx^2}}-\frac{\left(8b\sqrt{1-c^2x^2}\right)\int x^2(a+b\arcsin(cx))\,dx}{3c^3d\sqrt{d-c^2dx^2}}-\frac{\left(2b^2\sqrt{1-c^2x^2}\right)\int\frac{x^3}{\sqrt{1-c^2x^2}}dx}{3c^2d\sqrt{d-c^2dx^2}}$$

$$=\frac{2bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d\sqrt{d-c^2dx^2}}-\frac{2bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d\sqrt{d-c^2dx^2}}+\frac{x^4(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}+\frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^6d^2}+\frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d^2}-\frac{\left(2b\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}dx}{c^5d\sqrt{d-c^2dx^2}}-\frac{\left(16b\sqrt{1-c^2x^2}\right)\int(a+b\arcsin(cx))\,dx}{3c^5d\sqrt{d-c^2dx^2}}-\frac{\left(2b^2\sqrt{1-c^2x^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}dx}{c^4d\sqrt{d-c^2dx^2}}-\frac{\left(b^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\frac{x}{\sqrt{1-c^2x}}dx,x,x^2\right)}{3c^2d\sqrt{d-c^2dx^2}}+\frac{\left(8b^2\sqrt{1-c^2x^2}\right)\int\frac{x^3}{\sqrt{1-c^2x^2}}dx}{9c^2d\sqrt{d-c^2dx^2}}$$

$$=-\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}}+\frac{2b^2(1-c^2x^2)}{c^6d\sqrt{d-c^2dx^2}}+\frac{2bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d\sqrt{d-c^2dx^2}}-\frac{2bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d\sqrt{d-c^2dx^2}}+\frac{x^4(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}+\frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^6d^2}+\frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d^2}-\frac{\left(2b\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{c^6d\sqrt{d-c^2dx^2}}-\frac{\left(16b^2\sqrt{1-c^2x^2}\right)\int\arcsin(cx)\,dx}{3c^5d\sqrt{d-c^2dx^2}}-\frac{\left(b^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\left(\frac{1}{c^2\sqrt{1-c^2x}}-\frac{\sqrt{1-c^2x}}{c^2}\right)dx,x,x^2\right)}{3c^2d\sqrt{d-c^2dx^2}}+\frac{\left(4b^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\frac{x}{\sqrt{1-c^2x}}dx,x,x^2\right)}{9c^2d\sqrt{d-c^2dx^2}}$$

$$= -\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}} + \frac{8b^2(1-c^2x^2)}{3c^6d\sqrt{d-c^2dx^2}} - \frac{2b^2(1-c^2x^2)^2}{9c^6d\sqrt{d-c^2dx^2}} - \frac{16b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{3c^5d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d\sqrt{d-c^2dx^2}} - \frac{2bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^6d^2} + \frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d^2} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}} + \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^6d\sqrt{d-c^2dx^2}} - \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^6d\sqrt{d-c^2dx^2}} + \frac{\left(16b^2\sqrt{1-c^2x^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{3c^4d\sqrt{d-c^2dx^2}} + \frac{\left(4b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\left(\frac{1}{c^2\sqrt{1-c^2x}}-\frac{\sqrt{1-c^2x}}{c^2}\right)\,dx,x,x^2\right)}{9c^2d\sqrt{d-c^2dx^2}}$$

$$= -\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}} - \frac{32b^2(1-c^2x^2)}{9c^6d\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)^2}{27c^6d\sqrt{d-c^2dx^2}} - \frac{16b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{3c^5d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d\sqrt{d-c^2dx^2}} - \frac{2bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^6d^2} + \frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d^2} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}} - \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}} + \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}$$

$$= -\frac{16abx\sqrt{1-c^2x^2}}{3c^5d\sqrt{d-c^2dx^2}} - \frac{32b^2(1-c^2x^2)}{9c^6d\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)^2}{27c^6d\sqrt{d-c^2dx^2}}$$
$$- \frac{16b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{3c^5d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^5d\sqrt{d-c^2dx^2}}$$
$$- \frac{2bx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3d\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}$$
$$+ \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^6d^2} + \frac{4x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d^2}$$
$$+ \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}$$
$$- \frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}$$
$$+ \frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^6d\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.85 (sec) , antiderivative size = 453, normalized size of antiderivative = 0.83

$$\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{576a^2-378b^2-288a^2c^2x^2-72a^2c^4x^4+810ab\arcsin(cx)+405b^2\arcsin(cx)^2}{}$$

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (576*a^2 - 378*b^2 - 288*a^2*c^2*x^2 - 72*a^2*c^4*x^4 + 810*a*b*ArcSin[c*x]
 + 405*b^2*ArcSin[c*x]^2 - 376*b^2*Cos[2*ArcSin[c*x]] + 360*a*b*ArcSin[c*x]
*Cos[2*ArcSin[c*x]] + 180*b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] + 2*b^2*Cos[
4*ArcSin[c*x]] - 18*a*b*ArcSin[c*x]*Cos[4*ArcSin[c*x]] - 9*b^2*ArcSin[c*x]^
2*Cos[4*ArcSin[c*x]] - 432*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - I*E^(I
*ArcSin[c*x])] + 432*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*ArcSi
n[c*x])] + 432*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2]] - 432*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]
/2]] - (432*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (
432*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])] - 372*a*b*Sin[
2*ArcSin[c*x]] - 372*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]] + 6*a*b*Sin[4*ArcSi
n[c*x]] + 6*b^2*ArcSin[c*x]*Sin[4*ArcSin[c*x]])/(216*c^6*d*Sqrt[d - c^2*d*x
^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1086 vs. 2(516) = 1032.

Time = 0.54 (sec) , antiderivative size = 1087, normalized size of antiderivative = 1.98

method	result	size
default	Expression too large to display	1087
parts	Expression too large to display	1087

```
[In] int(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/3*x^4/c^2/d/(-c^2*d*x^2+d)^(1/2)+4/3/c^2*(-x^2/c^2/d/(-c^2*d*x^2+d)
^(1/2)+2/d/c^4/(-c^2*d*x^2+d)^(1/2)))-1/108*b^2*(-d*(c^2*x^2-1))^(1/2)/c^6/
d^2/(c^2*x^2-1)*cos(4*arcsin(c*x))+1/24*b^2*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/
(c^2*x^2-1)*cos(4*arcsin(c*x))*arcsin(c*x)^2+31/9*b^2*(-d*(c^2*x^2-1))^(1/2
)/c^5/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x-94/27*b^2*(-d*(c^2*x
^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*x^2+377/108*b^2*(-d*(c^2*x^2-1))^(1/2)/c^6
/d^2/(c^2*x^2-1)+5/3*b^2*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(
c*x)^2*x^2-1/36*b^2*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*arcsin(c*x)*
sin(4*arcsin(c*x))-65/24*b^2*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*arc
sin(c*x)^2-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2
-1)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*b^2*(-c^2*x^2+1)^(1/2)
*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2
*x^2+1)^(1/2)))+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(
c^2*x^2-1)*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*b^2*(-c^2*x^2+1)^(1/2)
*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(
1/2)))-65/12*a*b*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*arcsin(c*x)+31/
9*a*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x+1/12*
a*b*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*arcsin(c*x)*cos(4*arcsin(c*x
))+2*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d^2/(c^2*x^2-1)*ln(I
*c*x+(-c^2*x^2+1)^(1/2)+I)-2*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/
c^6/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)+10/3*a*b*(-d*(c^2*x^2-1)
)^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)*x^2-1/36*a*b*(-d*(c^2*x^2-1))^(1/2)
/c^6/d^2/(c^2*x^2-1)*sin(4*arcsin(c*x))
```

Fricas [F]

$$\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^5}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
[Out] integral((b^2*x^5*arcsin(c*x)^2 + 2*a*b*x^5*arcsin(c*x) + a^2*x^5)*sqrt(-c^
2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^5(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x**5*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral(x**5*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^5}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
[Out] -1/3*a^2*(x^4/(sqrt(-c^2*d*x^2 + d)*c^2*d) + 4*x^2/(sqrt(-c^2*d*x^2 + d)*c^
4*d) - 8/(sqrt(-c^2*d*x^2 + d)*c^6*d)) + 1/3*((b^2*c^4*x^4 + 4*b^2*c^2*x^2
- 8*b^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*sqrt(d)*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1))^2 + 3*(c^8*d^2*x^2 - c^6*d^2)*integrate(2/3*(3*sqrt(c*x + 1)*
sqrt(-c*x + 1)*a*b*c^5*sqrt(d)*x^5*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)) - (b^2*c^6*x^6 + 3*b^2*c^4*x^4 - 12*b^2*c^2*x^2 + 8*b^2)*sqrt(d)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^9*d^2*x^4 - 2*c^7*d^2*x^2 + c^5*d^2
), x))/(c^8*d^2*x^2 - c^6*d^2)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^5\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((x^5*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((x^5*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

3.245 $\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 424

$$\begin{aligned}\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= -\frac{b^2x(1-c^2x^2)}{4c^4d\sqrt{d-c^2dx^2}}+\frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^5d\sqrt{d-c^2dx^2}}\\ &-\frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}\\ &-\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^5d\sqrt{d-c^2dx^2}}+\frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^4d^2}\\ &-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc^5d\sqrt{d-c^2dx^2}}+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^5d\sqrt{d-c^2dx^2}}\\ &-\frac{ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^5d\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] -1/4*b^2*x*(-c^2*x^2+1)/c^4/d/(-c^2*d*x^2+d)^(1/2)+x^3*(a+b*arcsin(c*x))^2/
c^2/d/(-c^2*d*x^2+d)^(1/2)+1/4*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^5/d/(-c
^2*d*x^2+d)^(1/2)-1/2*b*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^
2*d*x^2+d)^(1/2)-I*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^5/d/(-c^2*d*x^2
+d)^(1/2)-1/2*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^5/d/(-c^2*d*x^2+d)
^(1/2)+2*b*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1
)^(1/2)/c^5/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/
2))^2)*(-c^2*x^2+1)^(1/2)/c^5/d/(-c^2*d*x^2+d)^(1/2)+3/2*x*(a+b*arcsin(c*x)
)^2*(-c^2*d*x^2+d)^(1/2)/c^4/d^2
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 424, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.379$, Rules used = {4791, 4795, 4737, 4723, 327, 222, 4765, 3800, 2221, 2317, 2438}

$$\begin{aligned}\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= \frac{x^3(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} \\ &- \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc^5d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^5d\sqrt{d-c^2dx^2}} \\ &+ \frac{2b\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^5d\sqrt{d-c^2dx^2}} \\ &+ \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^4d^2} - \frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d\sqrt{d-c^2dx^2}} \\ &- \frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^5d\sqrt{d-c^2dx^2}} \\ &+ \frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^5d\sqrt{d-c^2dx^2}} - \frac{b^2x(1-c^2x^2)}{4c^4d\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -1/4*(b^2*x*(1 - c^2*x^2))/(c^4*d*Sqrt[d - c^2*d*x^2]) + (b^2*Sqrt[1 - c^2*
x^2]*ArcSin[c*x])/(4*c^5*d*Sqrt[d - c^2*d*x^2]) - (b*x^2*Sqrt[1 - c^2*x^2]*
(a + b*ArcSin[c*x]))/(2*c^3*d*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c*x
])^2)/(c^2*d*Sqrt[d - c^2*d*x^2]) - (I*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
)^2)/(c^5*d*Sqrt[d - c^2*d*x^2]) + (3*x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c
*x])^2)/(2*c^4*d^2) - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(2*b*c^5*d*
Sqrt[d - c^2*d*x^2]) + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E
^((2*I)*ArcSin[c*x])])/(c^5*d*Sqrt[d - c^2*d*x^2]) - (I*b^2*Sqrt[1 - c^2*x^
2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^5*d*Sqrt[d - c^2*d*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = \frac{x^3(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{3\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^3(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^4d^2} - \frac{3\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{2c^4d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{c^3d\sqrt{d-c^2dx^2}} - \frac{\left(3b\sqrt{1-c^2x^2}\right)\int x(a+b\arcsin(cx))\,dx}{c^3d\sqrt{d-c^2dx^2}} - \frac{\left(b^2\sqrt{1-c^2x^2}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2x(1-c^2x^2)}{2c^4d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^4d^2} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc^5d\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{c^5d\sqrt{d-c^2dx^2}} - \frac{\left(b^2\sqrt{1-c^2x^2}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{2c^4d\sqrt{d-c^2dx^2}} + \frac{\left(3b^2\sqrt{1-c^2x^2}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2c^2d\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2x(1-c^2x^2)}{4c^4d\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{2c^5d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^5d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^4d^2} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc^5d\sqrt{d-c^2dx^2}} + \frac{\left(4ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{c^5d\sqrt{d-c^2dx^2}} + \frac{\left(3b^2\sqrt{1-c^2x^2}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4c^4d\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2x(1-c^2x^2)}{4c^4d\sqrt{d-c^2dx^2}} + \frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^5d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^5d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^4d^2} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc^5d\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^5d\sqrt{d-c^2dx^2}} - \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{c^5d\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2x(1-c^2x^2)}{4c^4d\sqrt{d-c^2dx^2}} + \frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^5d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^5d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^4d^2} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc^5d\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^5d\sqrt{d-c^2dx^2}} + \frac{\left(ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{c^5d\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2x(1-c^2x^2)}{4c^4d\sqrt{d-c^2dx^2}} + \frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^5d\sqrt{d-c^2dx^2}} - \frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^3d\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^5d\sqrt{d-c^2dx^2}} + \frac{3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^4d^2} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc^5d\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^5d\sqrt{d-c^2dx^2}} - \frac{ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^5d\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 2.20 (sec) , antiderivative size = 312, normalized size of antiderivative = 0.74

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{-4a^2c\sqrt{d}x(-3+c^2x^2)+12a^2\sqrt{d-c^2dx^2}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right)+2ab\sqrt{d}(8cx}{}$$

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (-4*a^2*c*Sqrt[d]*x*(-3 + c^2*x^2) + 12*a^2*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x
*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + 2*a*b*Sqrt[d]*(8*c*x*ArcS
in[c*x] + Sqrt[1 - c^2*x^2]*(-6*ArcSin[c*x]^2 + Cos[2*ArcSin[c*x]] + 4*Log[
1 - c^2*x^2] + 2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])) + b^2*Sqrt[d]*(8*c*x*ArcS
in[c*x]^2 - (8*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])] + Sq
rt[1 - c^2*x^2]*(-4*ArcSin[c*x]^3 + 2*ArcSin[c*x]*(Cos[2*ArcSin[c*x]] + 8*L
og[1 + E^((2*I)*ArcSin[c*x])]) - Sin[2*ArcSin[c*x]] + 2*ArcSin[c*x]^2*(-4*I
 + Sin[2*ArcSin[c*x]]))))/(8*c^5*d^(3/2)*Sqrt[d - c^2*d*x^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 806 vs. 2(402) = 804.

Time = 0.26 (sec) , antiderivative size = 807, normalized size of antiderivative = 1.90

method	result
default	$-\frac{a^2x^3}{2c^2d\sqrt{-c^2d\,x^2+d}} + \frac{3a^2x}{2c^4d\sqrt{-c^2d\,x^2+d}} - \frac{3a^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^4d\sqrt{c^2d}} + b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{2c^5d^2(c^2x^2-1)} + \frac{i\sqrt{-}}{}\right.$
parts	$-\frac{a^2x^3}{2c^2d\sqrt{-c^2d\,x^2+d}} + \frac{3a^2x}{2c^4d\sqrt{-c^2d\,x^2+d}} - \frac{3a^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^4d\sqrt{c^2d}} + b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{2c^5d^2(c^2x^2-1)} + \frac{i\sqrt{-}}{}\right.$

[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)

[Out] -1/2*a^2*x^3/c^2/d/(-c^2*d*x^2+d)^(1/2)+3/2*a^2/c^4*x/d/(-c^2*d*x^2+d)^(1/2)-3/2*a^2/c^4/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^2*(1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)^3+I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*(2*I*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*arcsin(c*x)^2+polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2))-1/8*I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)*(-I+8*arcsin(c*x))-1/16*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*(18*arcsin(c*x)^2-1)*x-1/8*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)*cos(3*arcsin(c*x))-1/16*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*(2*arcsin(c*x)^2-1)*sin(3*arcsin(c*x)))+3/2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)^2+2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/8*a*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)-9/4*a*b*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)*x-1/8*a*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*cos(3*arcsin(c*x))-1/4*a*b*(-d*(c^2*x^2-1))^(1/2)/c^5/d^2/(c^2*x^2-1)*arcsin(c*x)*sin(3*arcsin(c*x))

Fricas [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(b\arcsin(cx)+a)^2x^4}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")

[Out] integral((b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)*sqrt(-c^2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{x^4(a+b\,\mathrm{asin}\,(cx))^2}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)

[Out] Integral(x**4*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)

Maxima [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^4}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] -1/2*a^2*(x^3/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 3*x/(sqrt(-c^2*d*x^2 + d)*c^4*
d) + 3*arcsin(c*x)/(c^5*d^(3/2))) + sqrt(d)*integrate((b^2*x^4*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*x^4*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d
^2), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^4\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

3.246 $\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 412

$$
\begin{aligned}
\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= -\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}}-\frac{2b^2(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}} \\
&- \frac{4b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{c^3d\sqrt{d-c^2dx^2}}+\frac{2bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d\sqrt{d-c^2dx^2}} \\
&+ \frac{x^2(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}+\frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^4d^2} \\
&+ \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} \\
&- \frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}+\frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

```
[Out] -2*b^2*(-c^2*x^2+1)/c^4/d/(-c^2*d*x^2+d)^(1/2)+x^2*(a+b*arcsin(c*x))^2/c^2/
d/(-c^2*d*x^2+d)^(1/2)-4*a*b*x*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2
)-4*b^2*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)+2*b*x*(
a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)+4*I*b*(a+b*a
rcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^4/d/(-c^2
*d*x^2+d)^(1/2)-2*I*b^2*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+
1)^(1/2)/c^4/d/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)
^(1/2)))*(-c^2*x^2+1)^(1/2)/c^4/d/(-c^2*d*x^2+d)^(1/2)+2*(a+b*arcsin(c*x))^
2*(-c^2*d*x^2+d)^(1/2)/c^4/d^2
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 412, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.310$, Rules used = {4791, 4767, 4715, 267, 4795, 4749, 4266, 2317, 2438}

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{4ib\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^4d^2} + \frac{2bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d\sqrt{d-c^2dx^2}} - \frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} - \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} + \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} - \frac{4b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{c^3d\sqrt{d-c^2dx^2}} - \frac{2b^2(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (-4*a*b*x*Sqrt[1 - c^2*x^2])/(c^3*d*Sqrt[d - c^2*d*x^2]) - (2*b^2*(1 - c^2*
x^2))/(c^4*d*Sqrt[d - c^2*d*x^2]) - (4*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])
/(c^3*d*Sqrt[d - c^2*d*x^2]) + (2*b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/(c^3*d*Sqrt[d - c^2*d*x^2]) + (x^2*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d -
 c^2*d*x^2]) + (2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(c^4*d^2) + ((
4*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^
4*d*Sqrt[d - c^2*d*x^2]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(
I*ArcSin[c*x])])/(c^4*d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*Sqrt[1 - c^2*x^2]
*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^4*d*Sqrt[d - c^2*d*x^2])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
```

```
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = \frac{x^2(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{2\int\frac{x(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int\frac{x^2(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{2bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^4d^2} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{c^3d\sqrt{d-c^2dx^2}} - \frac{\left(4b\sqrt{1-c^2x^2}\right)\int(a+b\arcsin(cx))\,dx}{c^3d\sqrt{d-c^2dx^2}} - \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}$$

$$= -\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^4d^2} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{c^4d\sqrt{d-c^2dx^2}} - \frac{\left(4b^2\sqrt{1-c^2x^2}\right)\int\arcsin(cx)\,dx}{c^3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}} - \frac{4b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{c^3d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^4d^2} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} + \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^4d\sqrt{d-c^2dx^2}} - \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^4d\sqrt{d-c^2dx^2}} + \frac{\left(4b^2\sqrt{1-c^2x^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{c^2d\sqrt{d-c^2dx^2}}$$

$$= -\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} - \frac{2b^2(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}} - \frac{4b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{c^3d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^4d^2} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} - \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} + \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}$$

$$= -\frac{4abx\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} - \frac{2b^2(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}} - \frac{4b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{c^3d\sqrt{d-c^2dx^2}} + \frac{2bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^4d^2} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} - \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} + \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.69 (sec) , antiderivative size = 369, normalized size of antiderivative = 0.90

$$\int\frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{4a^2-2b^2-2a^2c^2x^2+6ab\arcsin(cx)+3b^2\arcsin(cx)^2-2b^2\cos(2\arcsin(cx))}{}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (4*a^2 - 2*b^2 - 2*a^2*c^2*x^2 + 6*a*b*ArcSin[c*x] + 3*b^2*ArcSin[c*x]^2 -
2*b^2*Cos[2*ArcSin[c*x]] + 2*a*b*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + b^2*ArcSi
n[c*x]^2*Cos[2*ArcSin[c*x]] - 4*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - I
*E^(I*ArcSin[c*x])] + 4*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*Ar
cSin[c*x])] + 4*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c
*x]/2]] - 4*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
```

```
2]] - (4*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (4*I
)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])] - 2*a*b*Sin[2*ArcSi
n[c*x]] - 2*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])/(2*c^4*d*Sqrt[d - c^2*d*x^2
])
```

Maple [A] (verified)

Time = 0.40 (sec) , antiderivative size = 668, normalized size of antiderivative = 1.62

method	result
default	$a^2\left(-\frac{x^2}{c^2 d\sqrt{-c^2 d\,x^2+d}}+\frac{2}{d\,c^4\sqrt{-c^2 d\,x^2+d}}\right)+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\left(c^2x^2-icx\sqrt{-c^2x^2+1}-1\right)\left(\arcsin(cx)^2-2+2i\arcsin(cx)\right)}{2c^4d^2(c^2x^2-1)}\right.$
parts	$a^2\left(-\frac{x^2}{c^2 d\sqrt{-c^2 d\,x^2+d}}+\frac{2}{d\,c^4\sqrt{-c^2 d\,x^2+d}}\right)+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\left(c^2x^2-icx\sqrt{-c^2x^2+1}-1\right)\left(\arcsin(cx)^2-2+2i\arcsin(cx)\right)}{2c^4d^2(c^2x^2-1)}\right.$

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-x^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+2/d/c^4/(-c^2*d*x^2+d)^(1/2))+b^2*(1/2
*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2
-2+2*I*arcsin(c*x))/c^4/d^2/(c^2*x^2-1)+1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2
*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^4/d^2/(c^2
*x^2-1)-(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)^2-2*(-c^2*x^
2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(
1/2)))-arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-I*dilog(1+I*(I*c*x+(-
c^2*x^2+1)^(1/2)))+I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))))/c^4/d^2/(c^2*x^
2-1))+2*a*b*(-d*(c^2*x^2-1))^(1/2)/c^3/d^2/(c^2*x^2-1)*(-c^2*x^2+1)^(1/2)*x
+2*a*b*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)*x^2-4*a*b*(-d
*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)+2*a*b*(-c^2*x^2+1)^(1/2
)*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)
-2*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(c^2*x^2-1)*ln(I*c
*x+(-c^2*x^2+1)^(1/2)-I)
```

Fricas [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(b\arcsin{(cx)}+a)^2x^3}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral((b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3)*sqrt(-c^
2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^3(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral(x**3*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^3}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
[Out] -a*b*c*(2*x/(c^4*d^(3/2)) + log(c*x + 1)/(c^5*d^(3/2)) - log(c*x - 1)/(c^5*
d^(3/2))) - 2*a*b*(x^2/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 2/(sqrt(-c^2*d*x^2 +
d)*c^4*d))*arcsin(c*x) - a^2*(x^2/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 2/(sqrt(-c
^2*d*x^2 + d)*c^4*d)) + ((c^2*x^2 - 2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*sqrt(d)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 - (c^6*d^2*x^2 - c^4*d^2)*sqr
t(d)*integrate(2*(c^2*x^4 - 2*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))/(c^3*d^2*x^2 - c*d^2), x))*b^2/(c^6*d^2*x^2 - c^4*d^2)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^3\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
[Out] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

3.247 $\int \frac{x^2(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 250

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}} - \frac{ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}$$

```
[Out] x*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2)-I*(a+b*arcsin(c*x))^2*(-c^
2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-1/3*(a+b*arcsin(c*x))^3*(-c^2*x^2
+1)^(1/2)/b/c^3/d/(-c^2*d*x^2+d)^(1/2)+2*b*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-
c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*po
lylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2
+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.241, Rules used

= {4791, 4737, 4765, 3800, 2221, 2317, 2438}

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^3d\sqrt{d-c^2dx^2}} - \frac{ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x])^2)/(c^2*d*Sqrt[d - c^2*d*x^2]) - (I*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x])^2)/(c^3*d*Sqrt[d - c^2*d*x^2]) - (Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x])^3)/(3*b*c^3*d*Sqrt[d - c^2*d*x^2]) + (2*b*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c^3*d*Sqrt[d - c^2
*d*x^2]) - (I*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^
3*d*Sqrt[d - c^2*d*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\text{integral} = \frac{x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{c^3d\sqrt{d-c^2dx^2}}$$

$$= \frac{x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} + \frac{\left(4ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{c^3d\sqrt{d-c^2dx^2}}$$

$$=\frac{x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}}-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}}+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}-\frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{c^3d\sqrt{d-c^2dx^2}}$$

$$=\frac{x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}}-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}}+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}+\frac{\left(ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}$$

$$=\frac{x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}}-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}}+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}-\frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 1.01 (sec) , antiderivative size = 295, normalized size of antiderivative = 1.18

$$\int\frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx=-\frac{a^2x\sqrt{-d\left(-1+c^2x^2\right)}}{c^2d^2\left(-1+c^2x^2\right)}+\frac{a^2\arctan\left(\frac{cx\sqrt{-d(-1+c^2x^2)}}{\sqrt{d}(-1+c^2x^2)}\right)}{c^3d^{3/2}}+\frac{ab\left(2cx\arcsin(cx)-\sqrt{1-c^2x^2}\left(\arcsin(cx)^2-2\log\left(\sqrt{1-c^2x^2}\right)\right)\right)}{c^3d\sqrt{d\left(1-c^2x^2\right)}}+\frac{b^2\left(\arcsin(cx)\left(3cx\arcsin(cx)-\sqrt{1-c^2x^2}\arcsin(cx)(3i+\arcsin(cx))+6\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)\right)\right.}{3c^3d\sqrt{d\left(1-c^2x^2\right)}}$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] -((a^2*x*Sqrt[-(d*(-1 + c^2*x^2))])/(c^2*d^2*(-1 + c^2*x^2))) + (a^2*ArcTan
[(c*x*Sqrt[-(d*(-1 + c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))])/(c^3*d^(3/2)) +
 (a*b*(2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*(ArcSin[c*x]^2 - 2*Log[Sqrt[1
 - c^2*x^2]])))/(c^3*d*Sqrt[d*(1 - c^2*x^2)]) + (b^2*(ArcSin[c*x]*(3*c*x*Arc
Sin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(3*I + ArcSin[c*x]) + 6*Sqrt[1 - c
^2*x^2]*Log[1 + E^((2*I)*ArcSin[c*x])]) - (3*I)*Sqrt[1 - c^2*x^2]*PolyLog[2
, -E^((2*I)*ArcSin[c*x])]))/(3*c^3*d*Sqrt[d*(1 - c^2*x^2)])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 503 vs. $2(248) = 496$.

Time = 0.20 (sec) , antiderivative size = 504, normalized size of antiderivative = 2.02

method	result
default	$\frac{a^2 x}{c^2 d\sqrt{-c^2 d\,x^2+d}}-\frac{a^2 \arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{c^2 d\sqrt{c^2 d}}+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{3c^3d^2(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\left(cx+i\sqrt{-c^2x^2+1}\right)}{c^3d^2(c^2x^2-1)}\right.$
parts	$\frac{a^2 x}{c^2 d\sqrt{-c^2 d\,x^2+d}}-\frac{a^2 \arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{c^2 d\sqrt{c^2 d}}+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{3c^3d^2(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\left(cx+i\sqrt{-c^2x^2+1}\right)}{c^3d^2(c^2x^2-1)}\right.$

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*x/c^2/d/(-c^2*d*x^2+d)^(1/2)-a^2/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/
2)*x/(-c^2*d*x^2+d)^(1/2))+b^2*(1/3*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/
2)/c^3/d^2/(c^2*x^2-1)*arcsin(c*x)^3-(-d*(c^2*x^2-1))^(1/2)*(c*x+I*(-c^2*x^
2+1)^(1/2))*arcsin(c*x)^2/c^3/d^2/(c^2*x^2-1)+I*(-c^2*x^2+1)^(1/2)*(-d*(c^2
*x^2-1))^(1/2)/c^3/d^2/(c^2*x^2-1)*(2*I*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1
)^(1/2))^2)+2*arcsin(c*x)^2+polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)))+a*b*
(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(c^2*x^2-1)*arcsin(c*x)^2
+2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^3/d^2/(c^2*x^2-1)*arcs
in(c*x)-2*a*b*(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^2-1)*arcsin(c*x)*x-2*a*
b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(c^2*x^2-1)*ln(1+(I*c*x
+(-c^2*x^2+1)^(1/2))^2)
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(-c^
2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^2(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral(x**2*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
[Out] a^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2))) + sqrt(d)*
integrate((b^2*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*x^2
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(
c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

3.248 $\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 208

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}$$

```
[Out] (a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+4*I*b*(a+b*arcsin(c*x))*arct
an(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)-
2*I*b^2*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d/(
-c^2*d*x^2+d)^(1/2)+2*I*b^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x
^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 208, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {4767, 4749, 4266, 2317, 2438}

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{4ib\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (a + b*ArcSin[c*x])^2/(c^2*d*Sqrt[d - c^2*d*x^2]) + ((4*I)*b*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^2*d*Sqrt[d - c^2*d*x^
2]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^2
*d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(c^2*d*Sqrt[d - c^2*d*x^2])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\text{integral} = \frac{(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{c^2d\sqrt{d-c^2dx^2}}$$

$$= \frac{(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^2d\sqrt{d-c^2dx^2}}$$

$$= \frac{(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}$$

$$= \frac{(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} + \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 1.58 (sec) , antiderivative size = 276, normalized size of antiderivative = 1.33

$$\int\frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{a^2+2ab\arcsin(cx)+b^2\arcsin(cx)^2-2b^2\sqrt{1-c^2x^2}\arcsin(cx)\log\left(1-ie^{i\arcsin\right.}}{}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (a^2 + 2*a*b*ArcSin[c*x] + b^2*ArcSin[c*x]^2 - 2*b^2*Sqrt[1 - c^2*x^2]*ArcS
in[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*
Log[1 + I*E^(I*ArcSin[c*x])] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/
2] - Sin[ArcSin[c*x]/2]] - 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] +
 Sin[ArcSin[c*x]/2]] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*Arc
Sin[c*x])] + (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(
c^2*d*Sqrt[d - c^2*d*x^2])
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 401, normalized size of antiderivative = 1.93

method	result
default	$\frac{a^2}{c^2 d\sqrt{-c^2 d\,x^2+d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)^2}{c^2d^2(c^2x^2-1)}-\frac{2\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\,\left(\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)-\mathrm{arc}\right.}{}\right.$
parts	$\frac{a^2}{c^2 d\sqrt{-c^2 d\,x^2+d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)^2}{c^2d^2(c^2x^2-1)}-\frac{2\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\,\left(\arcsin(cx)\ln\left(1+i\left(icx+\sqrt{-c^2x^2+1}\right)\right)-\mathrm{arc}\right.}{}\right.$

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
[Out] a^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+b^2*(-(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(c^2*x^
2-1)*arcsin(c*x)^2-2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(arcsin(c*x)
*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^
(1/2)))-I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*dilog(1-I*(I*c*x+(-c^2*x^
2+1)^(1/2))))/c^2/d^2/(c^2*x^2-1))+2*a*b*(-(-d*(c^2*x^2-1))^(1/2)/c^2/d^2/(
c^2*x^2-1)*arcsin(c*x)+(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^2/d^2/(c
^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)/c^2/d^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I))
```

Fricas [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2x}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) +
a^2*x)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{x\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral(x*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] sqrt(d)*integrate((b^2*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a
*b*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x +
1)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x) + a^2/(sqrt(-c^2*d*x^2 + d)*c^2*
d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

```
[Out] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

3.249 $\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 195

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= \frac{x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d-c^2dx^2}}\\ &\quad+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}}\\ &\quad-\frac{ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] x*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(1/2)-I*(a+b*arcsin(c*x))^2*(-c^2*x^
2+1)^(1/2)/c/d/(-c^2*d*x^2+d)^(1/2)+2*b*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2
*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*polylog
(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c/d/(-c^2*d*x^2+d)^(1/
2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 195, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {4745, 4765, 3800, 2221, 2317, 2438}

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= \frac{x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}}-\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d-c^2dx^2}}\\ &\quad+\frac{2b\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{cd\sqrt{d-c^2dx^2}}\\ &\quad-\frac{ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x])^2)/(d*Sqrt[d - c^2*d*x^2]) - (I*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])^2)/(c*d*Sqrt[d - c^2*d*x^2]) + (2*b*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*d*Sqrt[d - c^2*d*x^2])
- (I*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*d*Sqrt[d
- c^2*d*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}$$

$$= \frac{x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d-c^2dx^2}} + \frac{\left(4ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}} - \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}} + \frac{\left(ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}}$$

$$= \frac{x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d-c^2dx^2}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}} - \frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2, -e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.83 (sec) , antiderivative size = 165, normalized size of antiderivative = 0.85

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{b^2\left(cx-i\sqrt{1-c^2x^2}\right)\arcsin(cx)^2+2b\arcsin(cx)\left(acx+b\sqrt{1-c^2x^2}\log\left(1+e^{2i a}\right.\right.}{cd}$$

[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^(3/2),x]

[Out] (b^2*(c*x - I*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*b*ArcSin[c*x]*(a*c*x + b*Sqrt[1 - c^2*x^2]*Log[1 + E^((2*I)*ArcSin[c*x])]) + a*(a*c*x + b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2]) - I*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*d*Sqrt[d - c^2*d*x^2])

Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 354, normalized size of antiderivative = 1.82

method	result
default	$\frac{a^2x}{d\sqrt{-c^2dx^2+d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(cx+i\sqrt{-c^2x^2+1}\right)\arcsin(cx)^2}{c\,d^2(c^2x^2-1)}+\frac{i\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\left(2i\arcsin(cx)\ln\left(1+\left(icx\right.\right.\right.}{}\right.$
parts	$\frac{a^2x}{d\sqrt{-c^2dx^2+d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(cx+i\sqrt{-c^2x^2+1}\right)\arcsin(cx)^2}{c\,d^2(c^2x^2-1)}+\frac{i\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\left(2i\arcsin(cx)\ln\left(1+\left(icx\right.\right.\right.}{}\right.$

[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)

[Out] a^2/d*x/(-c^2*d*x^2+d)^(1/2)+b^2*(-(-d*(c^2*x^2-1))^(1/2)*(c*x+I*(-c^2*x^2+1)^(1/2))*arcsin(c*x)^2/c/d^2/(c^2*x^2-1)+I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c/d^2/(c^2*x^2-1)*(2*I*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*arcsin(c*x)^2+polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)))+2*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c/d^2/(c^2*x^2-1)*arcsin(c*x)-2*a*b*(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)/d^2/(c^2*x^2-1)*x-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d^2/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral((a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
[Out] 2*a*b*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) - b^2*integrate(arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt(-c*x + 1
)), x)/sqrt(d) + a^2*x/(sqrt(-c^2*d*x^2 + d)*d) - a*b*log(x^2 - 1/c^2)/(c*d
^(3/2))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^(3/2),x)
[Out] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^(3/2), x)
```

3.250 $\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 467

$$
\begin{aligned}
\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^{3/2}}\,dx &= \frac{(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} \\
&+ \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&- \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&+ \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&- \frac{2ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&+ \frac{2ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&- \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&- \frac{2b^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} + \frac{2b^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

```
[Out] (a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(1/2)+4*I*b*(a+b*arcsin(c*x))*arctan(I
*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-2*(a+b*a
rcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*
d*x^2+d)^(1/2)+2*I*b*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))
*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-2*I*b^2*polylog(2,-I*(I*c*x+(-c^
2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*polylog(
2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-2
```

```
*I*b*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/
2)/d/(-c^2*d*x^2+d)^(1/2)-2*b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*
x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)+2*b^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2
))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 467, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.345$, Rules used = {4793, 4803, 4268, 2611, 2320, 6724, 4749, 4266, 2317, 2438}

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^{3/2}}\,dx &= \frac{4ib\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}} \\ &- \frac{2\sqrt{1-c^2x^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} \\ &+ \frac{2ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}} \\ &- \frac{2ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}} \\ &+ \frac{(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\ &+ \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\ &- \frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} + \frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (a + b*ArcSin[c*x])^2/(d*Sqrt[d - c^2*d*x^2]) + ((4*I)*b*Sqrt[1 - c^2*x^2]*
(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (2
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/(d*Sqr
t[d - c^2*d*x^2]) + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[
2, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - ((2*I)*b^2*Sqrt[1 - c^2*x
^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + ((2*I)*b^
2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]
) - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c
*x])])/(d*Sqrt[d - c^2*d*x^2]) - (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*
ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3
, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} + \frac{\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx}{d} - \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}} \\
&= \frac{(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int (a+bx)^2\csc(x)\,dx, x, \arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}} \\
&= \frac{(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\log\left(1-e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\log\left(1+e^{ix}\right)\,dx, x, \arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$=\frac{(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}}+\frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$-\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$+\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$-\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\text{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\text{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}$$

$$=\frac{(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}}+\frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$-\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$+\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$-\frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$+\frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$-\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\text{PolyLog}(2,-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\text{PolyLog}(2,x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= \frac{(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} + \frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.89 (sec) , antiderivative size = 667, normalized size of antiderivative = 1.43

$$
\int \frac{(a+b\arcsin(cx))^2}{x\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{a^2d + a^2\sqrt{d}\sqrt{d-c^2dx^2}\log(cx) - a^2\sqrt{d}\sqrt{d-c^2dx^2}\log\left(d+\sqrt{d}\sqrt{d-c^2dx^2}\right) +}{}
$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (a^2*d + a^2*Sqrt[d]*Sqrt[d - c^2*d*x^2]*Log[c*x] - a^2*Sqrt[d]*Sqrt[d - c^
2*d*x^2]*Log[d + Sqrt[d]*Sqrt[d - c^2*d*x^2]] + 2*a*b*d*(ArcSin[c*x] + Sqrt
[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*Ar
cSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] + Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x
]/2] - Sin[ArcSin[c*x]/2]] - Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin
[ArcSin[c*x]/2]] + I*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])] - I*S
qrt[1 - c^2*x^2]*PolyLog[2, E^(I*ArcSin[c*x])]) + b^2*d*(ArcSin[c*x]^2 + Sq
rt[1 - c^2*x^2]*ArcSin[c*x]^2*Log[1 - E^(I*ArcSin[c*x])] - 2*Sqrt[1 - c^2*x
^2]*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*Sqrt[1 - c^2*x^2]*ArcSin[c
*x]*Log[1 + I*E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2*Log[1 +
E^(I*ArcSin[c*x])] + (2*I)*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*PolyLog[2, -E^(I*A
rcSin[c*x])] - (2*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] +
 (2*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])] - (2*I)*Sqrt[1 - c
^2*x^2]*ArcSin[c*x]*PolyLog[2, E^(I*ArcSin[c*x])] - 2*Sqrt[1 - c^2*x^2]*Pol
yLog[3, -E^(I*ArcSin[c*x])] + 2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*
x])]))/(d^2*Sqrt[d - c^2*d*x^2])
```

Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 591, normalized size of antiderivative = 1.27

method	result
default	$\frac{a^2}{d\sqrt{-c^2 d\,x^2+d}}-\frac{a^2 \ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2 d\,x^2+d}}{x}\right)}{d^{\frac{3}{2}}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)^2}{d^2(c^2x^2-1)}-\frac{i\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\,\left(i\arcsin(cx)^2\right.}{}\right.$
parts	$\frac{a^2}{d\sqrt{-c^2 d\,x^2+d}}-\frac{a^2 \ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2 d\,x^2+d}}{x}\right)}{d^{\frac{3}{2}}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)^2}{d^2(c^2x^2-1)}-\frac{i\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\,\left(i\arcsin(cx)^2\right.}{}\right.$

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2/d/(-c^2*d*x^2+d)^(1/2)-a^2/d^(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/
2))/x)+b^2*(-(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)^2-I*(-c^2*x
^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(I*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)
^(1/2))-I*arcsin(c*x)^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*arcsin(c*x)*ln(1
+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(
1/2)))+2*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-2*arcsin(c*x)*pol
ylog(2,I*c*x+(-c^2*x^2+1)^(1/2))+2*I*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-2
*I*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))-2*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2
)))+2*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))))/d^2/(c^2*x^2-1))+2*a*b*(-(-d*(
c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*arcsin(c*x)+(-c^2*x^2+1)^(1/2)*(-d*(c^2*x
^2-1))^(1/2)*(arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*arctan(I*c*x+(
-c^2*x^2+1)^(1/2))-I*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-I*dilog(1+I*c*x+(-c^2*
x^2+1)^(1/2)))/d^2/(c^2*x^2-1))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(b\arcsin{(cx)}+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2}{x\,(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral((a + b*asin(c*x))**2/(x*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima")
[Out] -a^2*(log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^(3/2) - 1/(
sqrt(-c^2*d*x^2 + d)*d)) + sqrt(d)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqr
t(c*x + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x), x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x\,(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^(3/2)),x)
[Out] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^(3/2)), x)
```

3.251 $\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 333

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^{3/2}}\,dx = -\frac{(a+b\arcsin(cx))^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{2ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} + \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$

```
[Out] -(a+b*arcsin(c*x))^2/d/x/(-c^2*d*x^2+d)^(1/2)+2*c^2*x*(a+b*arcsin(c*x))^2/d
/(-c^2*d*x^2+d)^(1/2)-2*I*c*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/d/(-c^2*
d*x^2+d)^(1/2)-4*b*c*(a+b*arcsin(c*x))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2
)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)+4*b*c*(a+b*arcsin(c*x))*ln(1+(I
*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-I*b^2
*c*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^
2+d)^(1/2)-I*b^2*c*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/
2)/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 333, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {4789, 4745, 4765, 3800, 2221, 2317, 2438, 4769, 4504, 4268}

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^{3/2}}\,dx = -\frac{4bc\sqrt{1-c^2x^2}\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}} + \frac{2c^2x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{2ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{dx\sqrt{d-c^2dx^2}} + \frac{4bc\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}} - \frac{ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])^2/(d*x*Sqrt[d - c^2*d*x^2])) + (2*c^2*x*(a + b*ArcSin
[c*x])^2)/(d*Sqrt[d - c^2*d*x^2]) - ((2*I)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSi
n[c*x])^2)/(d*Sqrt[d - c^2*d*x^2]) - (4*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + (4*b*c*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(d*Sqrt[
d - c^2*d*x^2]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*
x])])/(d*Sqrt[d - c^2*d*x^2]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2
*I)*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
```

```
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(a+b\arcsin(cx))^2}{dx\sqrt{d-c^2dx^2}}+\left(2c^2\right)\int\frac{(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx \\
&\quad+\frac{\left(2bc\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{x(1-c^2x^2)}\,dx}{d\sqrt{d-c^2dx^2}} \\
&= -\frac{(a+b\arcsin(cx))^2}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} \\
&\quad+\frac{\left(2bc\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int(a+bx)\csc(x)\sec(x)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad-\frac{\left(4bc^3\sqrt{1-c^2x^2}\right)\int\frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}} \\
&= -\frac{(a+b\arcsin(cx))^2}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} \\
&\quad+\frac{\left(4bc\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int(a+bx)\csc(2x)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad-\frac{\left(4bc\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}} \\
&= -\frac{(a+b\arcsin(cx))^2}{dx\sqrt{d-c^2dx^2}}+\frac{2c^2x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}}-\frac{2ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} \\
&\quad-\frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad+\frac{\left(8ibc\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad-\frac{\left(2b^2c\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad+\frac{\left(2b^2c\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{(a+b\arcsin(cx))^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{2ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(ib^2c\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(ib^2c\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(4b^2c\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{(a+b\arcsin(cx))^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{2ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2, -e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(2ib^2c\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{(a+b\arcsin(cx))^2}{dx\sqrt{d-c^2dx^2}} + \frac{2c^2x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{2ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2, -e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.18 (sec) , antiderivative size = 322, normalized size of antiderivative = 0.97

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{-a^2+2a^2c^2x^2-2ab\arcsin(cx)+4abc^2x^2\arcsin(cx)-b^2\arcsin(cx)^2+2b^2c^2x^2}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (-a^2 + 2*a^2*c^2*x^2 - 2*a*b*ArcSin[c*x] + 4*a*b*c^2*x^2*ArcSin[c*x] - b^2
*ArcSin[c*x]^2 + 2*b^2*c^2*x^2*ArcSin[c*x]^2 - (2*I)*b^2*c*x*Sqrt[1 - c^2*x
^2]*ArcSin[c*x]^2 + 2*b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - E^((2*I
)*ArcSin[c*x])] + 2*b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + E^((2*I)*
ArcSin[c*x])] + 2*a*b*c*x*Sqrt[1 - c^2*x^2]*Log[c*x] + a*b*c*x*Sqrt[1 - c^2
*x^2]*Log[1 - c^2*x^2] - I*b^2*c*x*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*A
rcSin[c*x])] - I*b^2*c*x*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])
])/(d*x*Sqrt[d - c^2*d*x^2])
```

Maple [A] (verified)

Time = 0.24 (sec) , antiderivative size = 513, normalized size of antiderivative = 1.54

method	result
default	$a^2\left(-\frac{1}{dx\sqrt{-c^2dx^2+d}}+\frac{2c^2x}{d\sqrt{-c^2dx^2+d}}\right)+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(2icx\sqrt{-c^2x^2+1}+2c^2x^2-1\right)\arcsin(cx)^2}{(c^2x^2-1)d^2x}+\frac{i\sqrt{-c^2x^2+1}\,\sqrt{}}{}\right.$
parts	$a^2\left(-\frac{1}{dx\sqrt{-c^2dx^2+d}}+\frac{2c^2x}{d\sqrt{-c^2dx^2+d}}\right)+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(2icx\sqrt{-c^2x^2+1}+2c^2x^2-1\right)\arcsin(cx)^2}{(c^2x^2-1)d^2x}+\frac{i\sqrt{-c^2x^2+1}\,\sqrt{}}{}\right.$

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/d/x/(-c^2*d*x^2+d)^(1/2)+2*c^2/d*x/(-c^2*d*x^2+d)^(1/2))+b^2*(-(-d*
(c^2*x^2-1))^(1/2)*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*arcsin(c*x)^2/(
c^2*x^2-1)/d^2/x+I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^
2*(2*I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+2*I*arcsin(c*x)*ln(1+(I*c
*x+(-c^2*x^2+1)^(1/2))^2)+2*I*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))+4*
arcsin(c*x)^2+2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+polylog(2,-(I*c*x+(-c^
2*x^2+1)^(1/2))^2)+2*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2)))*c)+2*a*b*(4*I*(-c
^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c^2*x^2-1)/d^2*arcsin(c*x)*c-(-d*(c
^2*x^2-1))^(1/2)*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*arcsin(c*x)/(c^2*
x^2-1)/d^2/x-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)/d^2*ln((
I*c*x+(-c^2*x^2+1)^(1/2))^4-1)*c)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^6 - 2*c^2*d^2*x^4 + d^2*x^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx = \int \frac{\left(a+b\operatorname{asin}\left(cx\right)\right)^2}{x^2\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral((a + b*asin(c*x))**2/(x**2*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
[Out] a*b*c*(log(c*x + 1)/d^(3/2) + log(c*x - 1)/d^(3/2) + 2*log(x)/d^(3/2)) + 2*
(2*c^2*x/(sqrt(-c^2*d*x^2 + d)*d) - 1/(sqrt(-c^2*d*x^2 + d)*d*x))*a*b*arcsi
n(c*x) + (2*c^2*x/(sqrt(-c^2*d*x^2 + d)*d) - 1/(sqrt(-c^2*d*x^2 + d)*d*x))*
a^2 - b^2*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^2*d*x^
4 - d*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\,(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*x^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\,(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^2\,(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^(3/2)),x)
[Out] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^(3/2)), x)
```

3.252 $\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 634

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^{3/2}}\,dx = & -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx\sqrt{d-c^2dx^2}} \\ & +\frac{3c^2(a+b\arcsin(cx))^2}{2d\sqrt{d-c^2dx^2}}-\frac{(a+b\arcsin(cx))^2}{2dx^2\sqrt{d-c^2dx^2}} \\ & +\frac{4ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\ & -\frac{3c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\ & -\frac{b^2c^2\sqrt{1-c^2x^2}\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d\sqrt{d-c^2dx^2}} \\ & +\frac{3ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\ & -\frac{2ib^2c^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\ & +\frac{2ib^2c^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\ & -\frac{3ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\ & -\frac{3b^2c^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\ & +\frac{3b^2c^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] 3/2*c^2*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(1/2)-1/2*(a+b*arcsin(c*x))^2/
d/x^2/(-c^2*d*x^2+d)^(1/2)-b*c*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/d/x/(-c
^2*d*x^2+d)^(1/2)+4*I*b*c^2*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/
2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-3*c^2*(a+b*arcsin(c*x))^2*arc
tanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-b^
2*c^2*arctanh((-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)
+3*I*b*c^2*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2
+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-2*I*b^2*c^2*polylog(2,-I*(I*c*x+(-c^2*x^2+
1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*c^2*polylog(2,
I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-3*I
*b*c^2*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(
1/2)/d/(-c^2*d*x^2+d)^(1/2)-3*b^2*c^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*
(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)+3*b^2*c^2*polylog(3,I*c*x+(-c^2*x
^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 634, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.483$, Rules used = {4789, 4793, 4803, 4268, 2611, 2320, 6724, 4749, 4266, 2317, 2438, 272, 65, 214}

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^{3/2}}\,dx =& \frac{4ibc^2\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}\\ &-\frac{3c^2\sqrt{1-c^2x^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}}\\ &+\frac{3ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}\\ &-\frac{3ibc^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d\sqrt{d-c^2dx^2}}\\ &+\frac{3c^2(a+b\arcsin(cx))^2}{2d\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx\sqrt{d-c^2dx^2}}\\ &-\frac{(a+b\arcsin(cx))^2}{2dx^2\sqrt{d-c^2dx^2}}-\frac{2ib^2c^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}\\ &+\frac{2ib^2c^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}\\ &-\frac{3b^2c^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}\\ &+\frac{3b^2c^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}-\frac{b^2c^2\sqrt{1-c^2x^2}\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -((b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(d*x*Sqrt[d - c^2*d*x^2])) +
(3*c^2*(a + b*ArcSin[c*x])^2)/(2*d*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x
])^2/(2*d*x^2*Sqrt[d - c^2*d*x^2]) + ((4*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (3*c^2*Sq
rt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/(d*Sqrt[d
 - c^2*d*x^2]) - (b^2*c^2*Sqrt[1 - c^2*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/(d*
Sqrt[d - c^2*d*x^2]) + ((3*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*P
olyLog[2, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - ((2*I)*b^2*c^2*Sqr
t[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
+ ((2*I)*b^2*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*Sqrt
[d - c^2*d*x^2]) - ((3*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyL
og[2, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) - (3*b^2*c^2*Sqrt[1 - c^2
*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2]) + (3*b^2*c^2*
Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
```

```
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(a+b\arcsin(cx))^2}{2dx^2\sqrt{d-c^2dx^2}}+\frac{1}{2}\left(3c^2\right)\int\frac{(a+b\arcsin(cx))^2}{x\left(d-c^2dx^2\right)^{3/2}}\,dx \\
&\quad+\frac{\left(bc\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{x^2(1-c^2x^2)}\,dx}{d\sqrt{d-c^2dx^2}} \\
&= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx\sqrt{d-c^2dx^2}}+\frac{3c^2(a+b\arcsin(cx))^2}{2d\sqrt{d-c^2dx^2}}-\frac{(a+b\arcsin(cx))^2}{2dx^2\sqrt{d-c^2dx^2}} \\
&\quad+\frac{(3c^2)\int\frac{(a+b\arcsin(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx}{2d}+\frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\int\frac{1}{x\sqrt{1-c^2x^2}}\,dx}{d\sqrt{d-c^2dx^2}} \\
&\quad+\frac{\left(bc^3\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}-\frac{\left(3bc^3\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{d\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx\sqrt{d-c^2dx^2}}+\frac{3c^2(a+b\arcsin(cx))^2}{2d\sqrt{d-c^2dx^2}}-\frac{(a+b\arcsin(cx))^2}{2dx^2\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(3c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)^2\csc(x)\,dx,x,\arcsin(cx)\right)}{2d\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(bc^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(3bc^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2d\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx\sqrt{d-c^2dx^2}}+\frac{3c^2(a+b\arcsin(cx))^2}{2d\sqrt{d-c^2dx^2}}$$
$$-\frac{(a+b\arcsin(cx))^2}{2dx^2\sqrt{d-c^2dx^2}}+\frac{4ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$-\frac{3c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{d\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(3bc^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(3bc^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(3b^2c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(3b^2c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx\sqrt{d-c^2dx^2}}+\frac{3c^2(a+b\arcsin(cx))^2}{2d\sqrt{d-c^2dx^2}} \\
&\quad -\frac{(a+b\arcsin(cx))^2}{2dx^2\sqrt{d-c^2dx^2}}+\frac{4ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad -\frac{3c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad -\frac{b^2c^2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad +\frac{3ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad -\frac{3ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad +\frac{\left(ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad -\frac{\left(ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad -\frac{\left(3ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad +\frac{\left(3ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad -\frac{\left(3ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad +\frac{\left(3ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx\sqrt{d-c^2dx^2}} + \frac{3c^2(a+b\arcsin(cx))^2}{2d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{(a+b\arcsin(cx))^2}{2dx^2\sqrt{d-c^2dx^2}} + \frac{4ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{3c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{b^2c^2\sqrt{1-c^2x^2}\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{3ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2ib^2c^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2ib^2c^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{3ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(3b^2c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\text{PolyLog}(2,-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(3b^2c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\text{PolyLog}(2,x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{dx\sqrt{d-c^2dx^2}} + \frac{3c^2(a+b\arcsin(cx))^2}{2d\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{2dx^2\sqrt{d-c^2dx^2}} + \frac{4ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{3c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{b^2c^2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d\sqrt{d-c^2dx^2}} + \frac{3ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{2ib^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} + \frac{2ib^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{3ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{3b^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} + \frac{3b^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}$$

Mathematica [A] (warning: unable to verify)

Time = 7.96 (sec) , antiderivative size = 844, normalized size of antiderivative = 1.33

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^{3/2}}\,dx = \sqrt{-d(-1+c^2x^2)}\left(-\frac{a^2}{2d^2x^2} - \frac{a^2c^2}{d^2(-1+c^2x^2)}\right) + \frac{3a^2c^2\log(x)}{2d^{3/2}} - \frac{3a^2c^2\log\left(d+\sqrt{d}\sqrt{-d(-1+c^2x^2)}\right)}{2d^{3/2}} + \frac{abc\left(6i\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)\sin(2\arcsin(cx)) - 6i\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)\sin(2\arcsin(cx)) - \frac{-2\arcsin(cx)\cdots}{\cdots}\right.}{\cdots} + \frac{b^2c^2\sqrt{1-c^2x^2}\left(8\arcsin(cx)^2 - 4\arcsin(cx)\cot\left(\frac{1}{2}\arcsin(cx)\right) - \arcsin(cx)^2\csc^2\left(\frac{1}{2}\arcsin(cx)\right) + 8\log\left(\tan\cdots\right.\right.}{\cdots}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*(-1/2*a^2/(d^2*x^2) - (a^2*c^2)/(d^2*(-1 + c^2*x^
2))) + (3*a^2*c^2*Log[x])/(2*d^(3/2)) - (3*a^2*c^2*Log[d + Sqrt[d]*Sqrt[-(d
*(-1 + c^2*x^2))]])/(2*d^(3/2)) + (a*b*c*((6*I)*PolyLog[2, -E^(I*ArcSin[c*x
```

```
])]*Sin[2*ArcSin[c*x]] - (6*I)*PolyLog[2, E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c
*x]] - (-2*ArcSin[c*x] + 6*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 3*ArcSin[c*x]*C
os[3*ArcSin[c*x]]*Log[1 - E^(I*ArcSin[c*x])] - 3*ArcSin[c*x]*Cos[3*ArcSin[c
*x]]*Log[1 + E^(I*ArcSin[c*x])] + 2*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/
2] - Sin[ArcSin[c*x]/2]] - 2*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2]] + Sqrt[1 - c^2*x^2]*(-3*ArcSin[c*x]*Log[1 - E^(I*ArcSin[c
*x])] + 3*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x])] - 2*Log[Cos[ArcSin[c*x]/2]
 - Sin[ArcSin[c*x]/2]] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) +
2*Sin[2*ArcSin[c*x]])/(c*x)))/(4*d*x*Sqrt[d*(1 - c^2*x^2)]) + (b^2*c^2*Sqrt
[1 - c^2*x^2]*(8*ArcSin[c*x]^2 - 4*ArcSin[c*x]*Cot[ArcSin[c*x]/2] - ArcSin[
c*x]^2*Csc[ArcSin[c*x]/2]^2 + 8*Log[Tan[ArcSin[c*x]/2]] - 16*(ArcSin[c*x]*(
Log[1 - I*E^(I*ArcSin[c*x])] - Log[1 + I*E^(I*ArcSin[c*x])]) + I*(PolyLog[2
, (-I)*E^(I*ArcSin[c*x])] - PolyLog[2, I*E^(I*ArcSin[c*x])])) + 12*(ArcSin[
c*x]^2*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) + (2*I)*Ar
cSin[c*x]*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])])
+ 2*(-PolyLog[3, -E^(I*ArcSin[c*x])] + PolyLog[3, E^(I*ArcSin[c*x])])) + Ar
cSin[c*x]^2*Sec[ArcSin[c*x]/2]^2 + (8*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Co
s[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (8*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2
])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 4*ArcSin[c*x]*Tan[ArcSin[c*x
]/2]))/(8*d*Sqrt[d*(1 - c^2*x^2)])
```

Maple [A] (verified)

Time = 0.34 (sec) , antiderivative size = 869, normalized size of antiderivative = 1.37

method	result
default	$a^2\left(-\frac{1}{2d\,x^2\sqrt{-c^2d\,x^2+d}}+\frac{3c^2\left(\frac{1}{d\sqrt{-c^2d\,x^2+d}}-\frac{\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2d\,x^2+d}}{x}\right)}{d^{\frac{3}{2}}}\right)}{2}\right)+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)\left(3c^2x^2\,\text{arc}\right.}{2d^2(c^2x\right.}$
parts	$a^2\left(-\frac{1}{2d\,x^2\sqrt{-c^2d\,x^2+d}}+\frac{3c^2\left(\frac{1}{d\sqrt{-c^2d\,x^2+d}}-\frac{\ln\left(\frac{2d+2\sqrt{d}\,\sqrt{-c^2d\,x^2+d}}{x}\right)}{d^{\frac{3}{2}}}\right)}{2}\right)+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)\left(3c^2x^2\,\text{arc}\right.}{2d^2(c^2x\right.}$

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(-1/2/d/x^2/(-c^2*d*x^2+d)^(1/2)+3/2*c^2*(1/d/(-c^2*d*x^2+d)^(1/2)-1/d^
(3/2)*ln((2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)))+b^2*(-1/2*(-d*(c^2*x^2-1
))^(1/2)/d^2/(c^2*x^2-1)/x^2*arcsin(c*x)*(3*c^2*x^2*arcsin(c*x)-2*c*x*(-c^2
*x^2+1)^(1/2)-arcsin(c*x))+1/2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/(c
^2*x^2-1)/d^2*(3*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-3*arcsin(c*x)
^2*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-6*I*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^
2+1)^(1/2))+6*I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-4*arcsin(c*
```

```
x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+4*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2
+1)^(1/2)))+4*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-4*I*dilog(1-I*(I*c*x+
(-c^2*x^2+1)^(1/2)))-2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-6*polylog(3,I*c*x+(-c
^2*x^2+1)^(1/2))+6*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+2*ln(1+I*c*x+(-c^2*
x^2+1)^(1/2)))*c^2)-I*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(3*I*ar
csin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))*x^4*c^4+3*dilog(I*c*x+(-c^2*x^2+1)
^(1/2))*c^4*x^4+4*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*c^4*x^4+3*dilog(1+I*c*x+
(-c^2*x^2+1)^(1/2))*c^4*x^4+3*I*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^2*x^2-3*I*
arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))*x^2*c^2+I*x^3*c^3-3*dilog(I*c*x+
(-c^2*x^2+1)^(1/2))*c^2*x^2-4*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*c^2*x^2-3*di
log(1+I*c*x+(-c^2*x^2+1)^(1/2))*c^2*x^2-I*(-c^2*x^2+1)^(1/2)*arcsin(c*x)-I*
c*x)/d^2/(c^4*x^4-2*c^2*x^2+1)/x^2
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{x^3(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**3*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
```

```
[Out] -1/2*(3*c^2*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^(3/2)
 - 3*c^2/(sqrt(-c^2*d*x^2 + d)*d) + 1/(sqrt(-c^2*d*x^2 + d)*d*x^2))*a^2 + s
qrt(d)*integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c
^4*d^2*x^7 - 2*c^2*d^2*x^5 + d^2*x^3), x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*x^3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^3\,(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^(3/2)), x)
```

3.253 $\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 483

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx &= -\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}}-\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{(a+b\arcsin(cx))^2}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2(a+b\arcsin(cx))^2}{3dx\sqrt{d-c^2dx^2}}\\
&\quad+\frac{8c^4x(a+b\arcsin(cx))^2}{3d\sqrt{d-c^2dx^2}}-\frac{8ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d\sqrt{d-c^2dx^2}}\\
&\quad-\frac{20bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}}\\
&\quad+\frac{16bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}}\\
&\quad-\frac{ib^2c^3\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}}\\
&\quad-\frac{5ib^2c^3\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] -1/3*b^2*c^2*(-c^2*x^2+1)/d/x/(-c^2*d*x^2+d)^(1/2)-1/3*(a+b*arcsin(c*x))^2/
d/x^3/(-c^2*d*x^2+d)^(1/2)-4/3*c^2*(a+b*arcsin(c*x))^2/d/x/(-c^2*d*x^2+d)^(
1/2)+8/3*c^4*x*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(1/2)-1/3*b*c*(a+b*arcs
in(c*x))*(-c^2*x^2+1)^(1/2)/d/x^2/(-c^2*d*x^2+d)^(1/2)-8/3*I*c^3*(a+b*arcsi
n(c*x))^2*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-20/3*b*c^3*(a+b*arcsin(
c*x))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^
2+d)^(1/2)+16/3*b*c^3*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*
(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*c^3*polylog(2,-(I*c*x+(-c^2
*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^(1/2)-5/3*I*b^2*c^3*p
```

```
olylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d/(-c^2*d*x^2+d)^
(1/2)
```

Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 483, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.379, Rules used = {4789, 4745, 4765, 3800, 2221, 2317, 2438, 4769, 4504, 4268, 270}

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^{3/2}}\,dx = -\frac{20bc^3\sqrt{1-c^2x^2}\text{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3d\sqrt{d-c^2dx^2}} - \frac{4c^2(a+b\arcsin(cx))^2}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d\sqrt{d-c^2dx^2}} - \frac{8ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d\sqrt{d-c^2dx^2}} + \frac{16bc^3\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3d\sqrt{d-c^2dx^2}} - \frac{ib^2c^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{5ib^2c^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}} - \frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] -1/3*(b^2*c^2*(1 - c^2*x^2))/(d*x*Sqrt[d - c^2*d*x^2]) - (b*c*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/(3*d*x^2*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x
])^2/(3*d*x^3*Sqrt[d - c^2*d*x^2]) - (4*c^2*(a + b*ArcSin[c*x])^2)/(3*d*x*S
qrt[d - c^2*d*x^2]) + (8*c^4*x*(a + b*ArcSin[c*x])^2)/(3*d*Sqrt[d - c^2*d*x
^2]) - (((8*I)/3)*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(d*Sqrt[d -
c^2*d*x^2]) - (20*b*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^((2
*I)*ArcSin[c*x])])/(3*d*Sqrt[d - c^2*d*x^2]) + (16*b*c^3*Sqrt[1 - c^2*x^2]*
(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*d*Sqrt[d - c^2*d*x^2
]) - (I*b^2*c^3*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(d*Sq
rt[d - c^2*d*x^2]) - (((5*I)/3)*b^2*c^3*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*
I)*ArcSin[c*x])])/(d*Sqrt[d - c^2*d*x^2])
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
```

```
+ e, 0] && GtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{(a+b\arcsin(cx))^2}{3dx^3\sqrt{d-c^2dx^2}}+\frac{1}{3}\left(4c^2\right)\int\frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^{3/2}}\,dx \\
&\quad+\frac{\left(2bc\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{x^3(1-c^2x^2)}\,dx}{3d\sqrt{d-c^2dx^2}} \\
&= -\frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2\sqrt{d-c^2dx^2}}-\frac{(a+b\arcsin(cx))^2}{3dx^3\sqrt{d-c^2dx^2}}-\frac{4c^2(a+b\arcsin(cx))^2}{3dx\sqrt{d-c^2dx^2}} \\
&\quad+\frac{1}{3}\left(8c^4\right)\int\frac{(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx+\frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\int\frac{1}{x^2\sqrt{1-c^2x^2}}\,dx}{3d\sqrt{d-c^2dx^2}} \\
&\quad+\frac{\left(2bc^3\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{x(1-c^2x^2)}\,dx}{3d\sqrt{d-c^2dx^2}}+\frac{\left(8bc^3\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{x(1-c^2x^2)}\,dx}{3d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2(a+b\arcsin(cx))^2}{3dx\sqrt{d-c^2dx^2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d\sqrt{d-c^2dx^2}} + \frac{\left(2bc^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\csc(x)\sec(x)\,dx,x,\arcsin(cx)\right)}{3d\sqrt{d-c^2dx^2}} + \frac{\left(8bc^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\csc(x)\sec(x)\,dx,x,\arcsin(cx)\right)}{3d\sqrt{d-c^2dx^2}} - \frac{\left(16bc^5\sqrt{1-c^2x^2}\right)\int\frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2(a+b\arcsin(cx))^2}{3dx\sqrt{d-c^2dx^2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d\sqrt{d-c^2dx^2}} + \frac{\left(4bc^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\csc(2x)\,dx,x,\arcsin(cx)\right)}{3d\sqrt{d-c^2dx^2}} + \frac{\left(16bc^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\csc(2x)\,dx,x,\arcsin(cx)\right)}{3d\sqrt{d-c^2dx^2}} - \frac{\left(16bc^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2(a+b\arcsin(cx))^2}{3dx\sqrt{d-c^2dx^2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d\sqrt{d-c^2dx^2}} - \frac{8ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d\sqrt{d-c^2dx^2}} - \frac{20bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}} + \frac{\left(32ibc^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{3d\sqrt{d-c^2dx^2}} - \frac{\left(2b^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3d\sqrt{d-c^2dx^2}} + \frac{\left(2b^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3d\sqrt{d-c^2dx^2}} - \frac{\left(8b^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3d\sqrt{d-c^2dx^2}} + \frac{\left(8b^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2(a+b\arcsin(cx))^2}{3dx\sqrt{d-c^2dx^2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d\sqrt{d-c^2dx^2}} - \frac{8ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d\sqrt{d-c^2dx^2}} - \frac{20bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}} + \frac{16bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}} + \frac{\left(ib^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}} - \frac{\left(ib^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}} + \frac{\left(4ib^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}} - \frac{\left(4ib^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}} - \frac{\left(16b^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2(a+b\arcsin(cx))^2}{3dx\sqrt{d-c^2dx^2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d\sqrt{d-c^2dx^2}} - \frac{8ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d\sqrt{d-c^2dx^2}} - \frac{20bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}} + \frac{16bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}} + \frac{5ib^2c^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}} - \frac{5ib^2c^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}} + \frac{\left(8ib^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2(1-c^2x^2)}{3dx\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3dx^2\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{3dx^3\sqrt{d-c^2dx^2}} - \frac{4c^2(a+b\arcsin(cx))^2}{3dx\sqrt{d-c^2dx^2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d\sqrt{d-c^2dx^2}} - \frac{8ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d\sqrt{d-c^2dx^2}} - \frac{20bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}} + \frac{16bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}} - \frac{ib^2c^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d\sqrt{d-c^2dx^2}} - \frac{5ib^2c^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3d\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 1.08 (sec) , antiderivative size = 462, normalized size of antiderivative = 0.96

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^{3/2}}\,dx = \frac{-a^2-4a^2c^2x^2-b^2c^2x^2+8a^2c^4x^4+b^2c^4x^4-abcx\sqrt{1-c^2x^2}-2ab\arcsin(cx)-}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^(3/2)),x]
```

```
[Out] (-a^2 - 4*a^2*c^2*x^2 - b^2*c^2*x^2 + 8*a^2*c^4*x^4 + b^2*c^4*x^4 - a*b*c*x
*Sqrt[1 - c^2*x^2] - 2*a*b*ArcSin[c*x] - 8*a*b*c^2*x^2*ArcSin[c*x] + 16*a*b
*c^4*x^4*ArcSin[c*x] - b^2*c*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x] - b^2*ArcSin[c
*x]^2 - 4*b^2*c^2*x^2*ArcSin[c*x]^2 + 8*b^2*c^4*x^4*ArcSin[c*x]^2 - (8*I)*b
^2*c^3*x^3*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 + 10*b^2*c^3*x^3*Sqrt[1 - c^2*x^
2]*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 6*b^2*c^3*x^3*Sqrt[1 - c^2*
x^2]*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] + 10*a*b*c^3*x^3*Sqrt[1 - c
^2*x^2]*Log[c*x] + 3*a*b*c^3*x^3*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2] - (3*I)
*b^2*c^3*x^3*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])] - (5*I)*b
^2*c^3*x^3*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(3*d*x^3*Sq
rt[d - c^2*d*x^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2843 vs. 2(470) = 940.

Time = 0.32 (sec) , antiderivative size = 2844, normalized size of antiderivative = 5.89

method	result	size
default	Expression too large to display	2844
parts	Expression too large to display	2844

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -32*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^5*c^8+8*I*a*
b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*c^6+16*a*b*(-d*(c^
2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*arcsin(c*x)*c^4+8/3*I*a*b*(-d
*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*c^4+8*a*b*(-d*(c^2*x^2-1)
)^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x*arcsin(c*x)*c^2+1/3*a*b*(-d*(c^2*x^2-
1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x^2*(-c^2*x^2+1)^(1/2)*c-10/3*a*b*(-d
*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+
1)^(1/2))^2-1)*c^3-2*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/(c^2
*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c^3+64/3*I*a*b*(-d*(c^2*x^2-1))^
(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^7*c^10-128/3*a*b*(-d*(c^2*x^2-1))^(1/2)
/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*arcsin(c*x)*c^6-8/3*b^2*(-d*(c^2*x^2-1))^(
1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*(-c^2*x^2+1)*c^6+32/3*b^2*(-d*(c^2*x^2
-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^5*(-c^2*x^2+1)*c^8+8*b^2*(-d*(c^2*
x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*arcsin(c*x)^2*c^4+4*b^2*(-d*(c^
2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x*arcsin(c*x)^2*c^2+8/3*b^2*(-d
*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)*c^3-64/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*arc
sin(c*x)^2*c^6-8/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2
*x*(-c^2*x^2+1)*arcsin(c*x)*c^4-32/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^
4-7*c^2*x^2-1)/d^2*x^3*(-c^2*x^2+1)*arcsin(c*x)*c^6-32/3*I*a*b*(-d*(c^2*x^2
-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^3*(-c^2*x^2+1)*c^6-16/3*I*a*b*(-d*
(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*(-c^2*x^2+1)^(1/2)*arcsin(c*
x)*c^3+32/3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)
*arcsin(c*x)*c^3-8/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d
^2*x*(-c^2*x^2+1)*c^4+64/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^
2-1)/d^2*x^5*(-c^2*x^2+1)*c^8+8/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c
^2*x^2-1)/d^2*(-c^2*x^2+1)^(1/2)*c^3+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*
x^4-7*c^2*x^2-1)/d^2/x^3*arcsin(c*x)+a^2*(-1/3/d/x^3/(-c^2*d*x^2+d)^(1/2)+4
/3*c^2*(-1/d/x/(-c^2*d*x^2+d)^(1/2)+2*c^2/d*x/(-c^2*d*x^2+d)^(1/2)))+10/3*I
*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*c^3*polylog(
2,I*c*x+(-c^2*x^2+1)^(1/2))+16/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^
(1/2)/d^2/(c^2*x^2-1)*c^3*arcsin(c*x)^2-10/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^
2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*c^3*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/
```

```
2))-10/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*c^3*
arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^
2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*c^3*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2
)-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*c^3*arcsi
n(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-128/3*I*a*b*(-d*(c^2*x^2-1))^(1/2
)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^5-64/3*I
*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^2*(-c^2*x^2+1)^(1
/2)*arcsin(c*x)^2*c^5+64/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^
2-1)/d^2*x^5*(-c^2*x^2+1)*arcsin(c*x)*c^8-32*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(
8*c^4*x^4-7*c^2*x^2-1)/d^2*x^5*arcsin(c*x)*c^8-8/3*I*b^2*(-d*(c^2*x^2-1))^(
1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*c^3+64/3*
I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^7*arcsin(c*x)*c^
10+10/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/(c^2*x^2-1)*c^3
*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+8*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4
*x^4-7*c^2*x^2-1)/d^2*x^3*arcsin(c*x)*c^6-8/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/
(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^2*(-c^2*x^2+1)^(1/2)*c^5+8/3*I*b^2*(-d*(c^2*x
^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*arcsin(c*x)*c^4+1/3*b^2*(-d*(c^2
*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/
2)*c-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*(-c^2*x^2
+1)^(1/2)*c^3+32/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x
^7*c^10-40/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x^5*c^8
+7/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2*x*c^4+1/3*b^2*(
-d*(c^2*x^2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x*c^2+1/3*b^2*(-d*(c^2*x^
2-1))^(1/2)/(8*c^4*x^4-7*c^2*x^2-1)/d^2/x^3*arcsin(c*x)^2
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
/(c^4*d^2*x^8 - 2*c^2*d^2*x^6 + d^2*x^4), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx = \int \frac{\left(a+b\operatorname{asin}\left(cx\right)\right)^2}{x^4\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral((a + b*asin(c*x))**2/(x**4*(-d*(c*x - 1)*(c*x + 1))**(3/2)), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
[Out] 1/3*(8*c^4*x/(sqrt(-c^2*d*x^2 + d)*d) - 4*c^2/(sqrt(-c^2*d*x^2 + d)*d*x) -
1/(sqrt(-c^2*d*x^2 + d)*d*x^3))*a^2 + sqrt(d)*integrate((b^2*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^4*d^2*x^8 - 2*c^2*d^2*x^6 + d^2*x^4
), x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*x^4), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^{3/2}}\,dx = \int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{x^4\,{\left(d-c^2\,d\,x^2\right)}^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^(3/2)),x)
[Out] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^(3/2)), x)
```

3.254 $\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 546

$$\begin{aligned}
\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx &= \frac{b^2}{3c^6d^2\sqrt{d-c^2dx^2}}+\frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}} \\
&+\frac{2b^2(1-c^2x^2)}{c^6d^2\sqrt{d-c^2dx^2}}+\frac{16b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{3c^5d^2\sqrt{d-c^2dx^2}}-\frac{bx^3(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&-\frac{11bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^5d^2\sqrt{d-c^2dx^2}}+\frac{x^4(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} \\
&-\frac{4x^2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^6d^3} \\
&-\frac{22ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}} \\
&+\frac{11ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}} \\
&-\frac{11ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

```
[Out] 1/3*x^4*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2/c^6/d^2/(-c^
2*d*x^2+d)^(1/2)+2*b^2*(-c^2*x^2+1)/c^6/d^2/(-c^2*d*x^2+d)^(1/2)-4/3*x^2*(a
+b*arcsin(c*x))^2/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b*x^3*(a+b*arcsin(c*x))/
c^3/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+16/3*a*b*x*(-c^2*x^2+1)^(1/
2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)+16/3*b^2*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c
^5/d^2/(-c^2*d*x^2+d)^(1/2)-11/3*b*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
^5/d^2/(-c^2*d*x^2+d)^(1/2)-22/3*I*b*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x
^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^6/d^2/(-c^2*d*x^2+d)^(1/2)+11/3*I*b^2*pol
ylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^6/d^2/(-c^2*d*x^
```

```
2+d)^(1/2)-11/3*I*b^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^
(1/2)/c^6/d^2/(-c^2*d*x^2+d)^(1/2)-8/3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(
1/2)/c^6/d^3
```

Rubi [A] (verified)

Time = 0.60 (sec) , antiderivative size = 546, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.379$, Rules used = {4791, 4767, 4715, 267, 4795, 4749, 4266, 2317, 2438, 272, 45}

$$\begin{aligned}
&\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \\
&-\frac{22ib\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c^6d^2\sqrt{d-c^2dx^2}}+\frac{x^4(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} \\
&-\frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^6d^3}-\frac{11bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^5d^2\sqrt{d-c^2dx^2}} \\
&-\frac{4x^2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{bx^3(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&+\frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}}+\frac{11ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}} \\
&-\frac{11ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}} \\
&+\frac{16b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{3c^5d^2\sqrt{d-c^2dx^2}}+\frac{2b^2(1-c^2x^2)}{c^6d^2\sqrt{d-c^2dx^2}}+\frac{b^2}{3c^6d^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

```
[In] Int[(x^5*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] b^2/(3*c^6*d^2*Sqrt[d - c^2*d*x^2]) + (16*a*b*x*Sqrt[1 - c^2*x^2])/(3*c^5*d
^2*Sqrt[d - c^2*d*x^2]) + (2*b^2*(1 - c^2*x^2))/(c^6*d^2*Sqrt[d - c^2*d*x^2
]) + (16*b^2*x*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^5*d^2*Sqrt[d - c^2*d*x^2
]) - (b*x^3*(a + b*ArcSin[c*x]))/(3*c^3*d^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*
d*x^2]) - (11*b*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^5*d^2*Sqrt[d
- c^2*d*x^2]) + (x^4*(a + b*ArcSin[c*x])^2)/(3*c^2*d*(d - c^2*d*x^2)^(3/2))
 - (4*x^2*(a + b*ArcSin[c*x])^2)/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) - (8*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(3*c^6*d^3) - (((22*I)/3)*b*Sqrt[1 -
c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^6*d^2*Sqrt[d - c
^2*d*x^2]) + (((11*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[
c*x])])/(c^6*d^2*Sqrt[d - c^2*d*x^2]) - (((11*I)/3)*b^2*Sqrt[1 - c^2*x^2]*P
olyLog[2, I*E^(I*ArcSin[c*x])])/(c^6*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^4(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{4\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx}{3c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^4(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}} \\
&= -\frac{bx^3(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{4x^2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{8\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{3c^4d^2} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{x^2(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{c^3d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(8b\sqrt{1-c^2x^2}\right)\int \frac{x^2(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3c^3d^2\sqrt{d-c^2dx^2}} + \frac{\left(b^2\sqrt{1-c^2x^2}\right)\int \frac{x^3}{(1-c^2x^2)^{3/2}}\,dx}{3c^2d^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= -\frac{bx^3(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{11bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^5d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{x^4(a+b\arcsin(cx))^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{4x^2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^6d^3}$$
$$+\frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{c^5d^2\sqrt{d-c^2dx^2}} + \frac{\left(8b\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{3c^5d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(16b\sqrt{1-c^2x^2}\right)\int(a+b\arcsin(cx))\,dx}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{\left(b^2\sqrt{1-c^2x^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{c^4d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(8b^2\sqrt{1-c^2x^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{x}{(1-c^2x)^{3/2}}\,dx,x,x^2\right)}{6c^2d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{11b^2(1-c^2x^2)}{3c^6d^2\sqrt{d-c^2dx^2}} - \frac{bx^3(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$
$$-\frac{11bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\arcsin(cx))^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}$$
$$-\frac{4x^2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^6d^3}$$
$$+\frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx))}{c^6d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(8b\sqrt{1-c^2x^2}\right)\text{Subst}(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx))}{3c^6d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(16b^2\sqrt{1-c^2x^2}\right)\int\arcsin(cx)\,dx}{3c^5d^2\sqrt{d-c^2dx^2}}$$
$$+\frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\left(\frac{1}{c^2(1-c^2x)^{3/2}}-\frac{1}{c^2\sqrt{1-c^2x}}\right)\,dx,x,x^2\right)}{6c^2d^2\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= \frac{b^2}{3c^6d^2\sqrt{d-c^2dx^2}} + \frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{10b^2(1-c^2x^2)}{3c^6d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{16b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{bx^3(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{11bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\arcsin(cx))^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}} \\
&\quad - \frac{4x^2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^6d^3} \\
&\quad - \frac{22ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^6d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c^6d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(8b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c^6d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(8b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c^6d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(16b^2\sqrt{1-c^2x^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{3c^4d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= \frac{b^2}{3c^6d^2\sqrt{d-c^2dx^2}} + \frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)}{c^6d^2\sqrt{d-c^2dx^2}} + \frac{16b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{bx^3(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{11bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{4x^2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^6d^3} - \frac{22ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}} + \frac{\left(ib^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^6d^2\sqrt{d-c^2dx^2}} - \frac{\left(ib^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c^6d^2\sqrt{d-c^2dx^2}} + \frac{\left(8ib^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}} - \frac{\left(8ib^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2}{3c^6d^2\sqrt{d-c^2dx^2}} + \frac{16abx\sqrt{1-c^2x^2}}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{2b^2(1-c^2x^2)}{c^6d^2\sqrt{d-c^2dx^2}} + \frac{16b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{bx^3(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{11bx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{x^4(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{4x^2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^6d^3} - \frac{22ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}} + \frac{11ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}} - \frac{11ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^6d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 1.52 (sec) , antiderivative size = 594, normalized size of antiderivative = 1.09

$$\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{\sqrt{d-c^2dx^2}\left(-64a^2+22b^2+96a^2c^2x^2-24a^2c^4x^4-50ab\arcsin(cx)-25b^2\text{a}\right.}{}$$

[In] Integrate[(x^5*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]

[Out] (Sqrt[d - c^2*d*x^2]*(-64*a^2 + 22*b^2 + 96*a^2*c^2*x^2 - 24*a^2*c^4*x^4 - 50*a*b*ArcSin[c*x] - 25*b^2*ArcSin[c*x]^2 + 28*b^2*Cos[2*ArcSin[c*x]] - 72*a*b*ArcSin[c*x]*Cos[2*ArcSin[c*x]] - 36*b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] + 6*b^2*Cos[4*ArcSin[c*x]] - 6*a*b*ArcSin[c*x]*Cos[4*ArcSin[c*x]] - 3*b^2*ArcSin[c*x]^2*Cos[4*ArcSin[c*x]] + 66*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] + 22*b^2*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 - I*E^(I*ArcSin[c*x])] - 66*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - 22*b^2*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x])] - 66*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 22*a*b*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 66*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + 22*a*b*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + (88*I)*b^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (88*I)*b^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])] + 8*a*b*Sin[2*ArcSin[c*x]] + 8*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]] + 6*a*b*Sin[4*ArcSin[c*x]] + 6*b^2*ArcSin[c*x]*Sin[4*ArcSin[c*x]]))/(24*c^6*d^3*(-1 + c^2*x^2)^2)

Maple [A] (verified)

Time = 0.58 (sec) , antiderivative size = 815, normalized size of antiderivative = 1.49

method	result
default	$a^2\left(-\frac{x^4}{c^2d(-c^2dx^2+d)^{\frac{3}{2}}}+\frac{\frac{4x^2}{c^2d(-c^2dx^2+d)^{\frac{3}{2}}}-\frac{8}{3dc^4(-c^2dx^2+d)^{\frac{3}{2}}}}{c^2}\right)+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(c^2x^2-icx\sqrt{-c^2x^2+1}-1\right)\left(\text{ar}\right.}{2c^6d^3(c^2x^2-1)}\right.$
parts	$a^2\left(-\frac{x^4}{c^2d(-c^2dx^2+d)^{\frac{3}{2}}}+\frac{\frac{4x^2}{c^2d(-c^2dx^2+d)^{\frac{3}{2}}}-\frac{8}{3dc^4(-c^2dx^2+d)^{\frac{3}{2}}}}{c^2}\right)+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(c^2x^2-icx\sqrt{-c^2x^2+1}-1\right)\left(\text{ar}\right.}{2c^6d^3(c^2x^2-1)}\right.$

[In] int(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)

[Out] a^2*(-x^4/c^2/d/(-c^2*d*x^2+d)^(3/2)+4/c^2*(x^2/c^2/d/(-c^2*d*x^2+d)^(3/2)-2/3/d/c^4/(-c^2*d*x^2+d)^(3/2)))+b^2*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^6/d^3/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arc

```
sin(c*x)^2-2-2*I*arcsin(c*x))/c^6/d^3/(c^2*x^2-1)+1/3*(-d*(c^2*x^2-1))^(1/2
)*(6*arcsin(c*x)^2*x^2*c^2-(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-c^2*x^2-5*arc
sin(c*x)^2+1)/(c^2*x^2-1)^2/c^6/d^3+11/3*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1)
)^(1/2)*(arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-arcsin(c*x)*ln(1-I*
(I*c*x+(-c^2*x^2+1)^(1/2)))-I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*dilog
(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))))/c^6/d^3/(c^2*x^2-1))+2*a*b*(-1/2*(-d*(c^2
*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/c^6/d^3
/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1
)*(arcsin(c*x)-I)/c^6/d^3/(c^2*x^2-1)+1/6*(-d*(c^2*x^2-1))^(1/2)*(12*c^2*x^
2*arcsin(c*x)-c*x*(-c^2*x^2+1)^(1/2)-10*arcsin(c*x))/c^6/(c^2*x^2-1)^2/d^3+
11/6*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d^3/(c^2*x^2-1)*ln(I*c*x
+(-c^2*x^2+1)^(1/2)-I)-11/6*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^6/d
^3/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I))
```

Fricas [F]

$$\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^5}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
[Out] integral(-(b^2*x^5*arcsin(c*x)^2 + 2*a*b*x^5*arcsin(c*x) + a^2*x^5)*sqrt(-c
^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^5(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x**5*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral(x**5*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^5}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] -1/3*a^2*(3*x^4/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 12*x^2/((-c^2*d*x^2 + d)^(
3/2)*c^4*d) + 8/((-c^2*d*x^2 + d)^(3/2)*c^6*d)) - 1/3*((3*b^2*c^4*x^4 - 12*
b^2*c^2*x^2 + 8*b^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*sqrt(d)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1))^2 + 3*(c^10*d^3*x^4 - 2*c^8*d^3*x^2 + c^6*d^3)*in
tegrate(2/3*(3*sqrt(c*x + 1)*sqrt(-c*x + 1)*a*b*c^5*sqrt(d)*x^5*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (3*b^2*c^6*x^6 - 15*b^2*c^4*x^4 + 20*b^2*
c^2*x^2 - 8*b^2)*sqrt(d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(c^11*
d^3*x^6 - 3*c^9*d^3*x^4 + 3*c^7*d^3*x^2 - c^5*d^3), x))/(c^10*d^3*x^4 - 2*c
^8*d^3*x^2 + c^6*d^3)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^5(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^5\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int((x^5*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((x^5*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

3.255 $\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 421

$$\begin{aligned}\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx &= \frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^5d^2\sqrt{d-c^2dx^2}}\\ &-\frac{bx^2(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}}-\frac{x(a+b\arcsin(cx))^2}{c^4d^2\sqrt{d-c^2dx^2}}\\ &+\frac{4i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^5d^2\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^5d^2\sqrt{d-c^2dx^2}}\\ &-\frac{8b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c^5d^2\sqrt{d-c^2dx^2}}\\ &+\frac{4ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c^5d^2\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] 1/3*x^3*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2*x/c^4/d^2/(-
c^2*d*x^2+d)^(1/2)-x*(a+b*arcsin(c*x))^2/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b
*x^2*(a+b*arcsin(c*x))/c^3/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/3*
b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)+4/3*I*(a+b*
arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*(a+b*arc
sin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^5/d^2/(-c^2*d*x^2+d)^(1/2)-8/3*b*(a+b*ar
csin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-
c^2*d*x^2+d)^(1/2)+4/3*I*b^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2
*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 421, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.310, Rules used = {4791, 4737, 4765, 3800, 2221, 2317, 2438, 294, 222}

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{x^3(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^5d^2\sqrt{d-c^2dx^2}} + \frac{4i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{8b\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{x(a+b\arcsin(cx))^2}{c^4d^2\sqrt{d-c^2dx^2}} - \frac{bx^2(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{4ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (b^2*x)/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) - (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x
])/(3*c^5*d^2*Sqrt[d - c^2*d*x^2]) - (b*x^2*(a + b*ArcSin[c*x]))/(3*c^3*d^2
*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c*x])^2)/(3*c^
2*d*(d - c^2*d*x^2)^(3/2)) - (x*(a + b*ArcSin[c*x])^2)/(c^4*d^2*Sqrt[d - c^
2*d*x^2]) + (((4*I)/3)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^5*d^2*Sq
rt[d - c^2*d*x^2]) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c^5*d^2
*Sqrt[d - c^2*d*x^2]) - (8*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 +
E^((2*I)*ArcSin[c*x])])/(3*c^5*d^2*Sqrt[d - c^2*d*x^2]) + (((4*I)/3)*b^2*Sq
rt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^5*d^2*Sqrt[d - c^2*d
*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 294

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(
n - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*n*(p + 1))), x] - Dist[c^n
*((m - n + 1)/(b*n*(p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
```

[m, 1]

Rubi steps

$$\text{integral} = \frac{x^3(a+b\arcsin(cx))^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx}{c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^3(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bx^2(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{x(a+b\arcsin(cx))^2}{c^4d^2\sqrt{d-c^2dx^2}} + \frac{\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{c^4d^2} + \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3c^3d^2\sqrt{d-c^2dx^2}} + \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{c^3d^2\sqrt{d-c^2dx^2}} + \frac{\left(b^2\sqrt{1-c^2x^2}\right)\int \frac{x^2}{(1-c^2x^2)^{3/2}}\,dx}{3c^2d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{bx^2(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{x(a+b\arcsin(cx))^2}{c^4d^2\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^5d^2\sqrt{d-c^2dx^2}} + \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{c^5d^2\sqrt{d-c^2dx^2}} - \frac{\left(b^2\sqrt{1-c^2x^2}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{3c^4d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2x}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{bx^2(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{x(a+b\arcsin(cx))^2}{c^4d^2\sqrt{d-c^2dx^2}} + \frac{4i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^5d^2\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^5d^2\sqrt{d-c^2dx^2}} - \frac{\left(4ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{3c^5d^2\sqrt{d-c^2dx^2}} - \frac{\left(4ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{c^5d^2\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= \frac{b^2 x}{3c^4 d^2 \sqrt{d-c^2 d x^2}} - \frac{b^2 \sqrt{1-c^2 x^2} \arcsin(cx)}{3c^5 d^2 \sqrt{d-c^2 d x^2}} - \frac{b x^2 (a+b \arcsin(cx))}{3c^3 d^2 \sqrt{1-c^2 x^2} \sqrt{d-c^2 d x^2}} \\
&+ \frac{x^3 (a+b \arcsin(cx))^2}{3c^2 d \left(d-c^2 d x^2\right)^{3/2}} - \frac{x (a+b \arcsin(cx))^2}{c^4 d^2 \sqrt{d-c^2 d x^2}} \\
&+ \frac{4i \sqrt{1-c^2 x^2} (a+b \arcsin(cx))^2}{3c^5 d^2 \sqrt{d-c^2 d x^2}} + \frac{\sqrt{1-c^2 x^2} (a+b \arcsin(cx))^3}{3b c^5 d^2 \sqrt{d-c^2 d x^2}} \\
&- \frac{8b \sqrt{1-c^2 x^2} (a+b \arcsin(cx)) \log\left(1+e^{2i \arcsin(cx)}\right)}{3c^5 d^2 \sqrt{d-c^2 d x^2}} \\
&+ \frac{\left(2b^2 \sqrt{1-c^2 x^2}\right) \text{Subst}\left(\int \log\left(1+e^{2ix}\right) \, dx, x, \arcsin(cx)\right)}{3c^5 d^2 \sqrt{d-c^2 d x^2}} \\
&+ \frac{\left(2b^2 \sqrt{1-c^2 x^2}\right) \text{Subst}\left(\int \log\left(1+e^{2ix}\right) \, dx, x, \arcsin(cx)\right)}{c^5 d^2 \sqrt{d-c^2 d x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{b^2 x}{3c^4 d^2 \sqrt{d-c^2 d x^2}} - \frac{b^2 \sqrt{1-c^2 x^2} \arcsin(cx)}{3c^5 d^2 \sqrt{d-c^2 d x^2}} - \frac{b x^2 (a+b \arcsin(cx))}{3c^3 d^2 \sqrt{1-c^2 x^2} \sqrt{d-c^2 d x^2}} \\
&+ \frac{x^3 (a+b \arcsin(cx))^2}{3c^2 d \left(d-c^2 d x^2\right)^{3/2}} - \frac{x (a+b \arcsin(cx))^2}{c^4 d^2 \sqrt{d-c^2 d x^2}} \\
&+ \frac{4i \sqrt{1-c^2 x^2} (a+b \arcsin(cx))^2}{3c^5 d^2 \sqrt{d-c^2 d x^2}} + \frac{\sqrt{1-c^2 x^2} (a+b \arcsin(cx))^3}{3b c^5 d^2 \sqrt{d-c^2 d x^2}} \\
&- \frac{8b \sqrt{1-c^2 x^2} (a+b \arcsin(cx)) \log\left(1+e^{2i \arcsin(cx)}\right)}{3c^5 d^2 \sqrt{d-c^2 d x^2}} \\
&- \frac{\left(i b^2 \sqrt{1-c^2 x^2}\right) \text{Subst}\left(\int \frac{\log(1+x)}{x} \, dx, x, e^{2i \arcsin(cx)}\right)}{3c^5 d^2 \sqrt{d-c^2 d x^2}} \\
&- \frac{\left(i b^2 \sqrt{1-c^2 x^2}\right) \text{Subst}\left(\int \frac{\log(1+x)}{x} \, dx, x, e^{2i \arcsin(cx)}\right)}{c^5 d^2 \sqrt{d-c^2 d x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{b^2 x}{3c^4 d^2 \sqrt{d-c^2 d x^2}} - \frac{b^2 \sqrt{1-c^2 x^2} \arcsin(cx)}{3c^5 d^2 \sqrt{d-c^2 d x^2}} - \frac{b x^2 (a+b \arcsin(cx))}{3c^3 d^2 \sqrt{1-c^2 x^2} \sqrt{d-c^2 d x^2}} \\
&+ \frac{x^3 (a+b \arcsin(cx))^2}{3c^2 d \left(d-c^2 d x^2\right)^{3/2}} - \frac{x (a+b \arcsin(cx))^2}{c^4 d^2 \sqrt{d-c^2 d x^2}} \\
&+ \frac{4i \sqrt{1-c^2 x^2} (a+b \arcsin(cx))^2}{3c^5 d^2 \sqrt{d-c^2 d x^2}} + \frac{\sqrt{1-c^2 x^2} (a+b \arcsin(cx))^3}{3b c^5 d^2 \sqrt{d-c^2 d x^2}} \\
&- \frac{8b \sqrt{1-c^2 x^2} (a+b \arcsin(cx)) \log\left(1+e^{2i \arcsin(cx)}\right)}{3c^5 d^2 \sqrt{d-c^2 d x^2}} \\
&+ \frac{4i b^2 \sqrt{1-c^2 x^2} \, \text{PolyLog}\left(2, -e^{2i \arcsin(cx)}\right)}{3c^5 d^2 \sqrt{d-c^2 d x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.38 (sec) , antiderivative size = 374, normalized size of antiderivative = 0.89

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{a^2c\sqrt{d}x(-3+4c^2x^2)+3a^2(-1+c^2x^2)\sqrt{d-c^2dx^2}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right)+b^2}{}$$

[In] Integrate[(x^4*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]

[Out] (a^2*c*Sqrt[d]*x*(-3 + 4*c^2*x^2) + 3*a^2*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + b^2*Sqrt[d]* (c*x - c^3*x^3 - Sqrt[1 - c^2*x^2]*ArcSin[c*x] - 3*c*x*ArcSin[c*x]^2 + 4*c^ 3*x^3*ArcSin[c*x]^2 + (4*I)*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2 + (1 - c^2*x^ 2)^(3/2)*ArcSin[c*x]^3 - 8*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]*Log[1 + E^((2*I) *ArcSin[c*x])] + (4*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])]) - a*b*Sqrt[d]*(Sqrt[1 - c^2*x^2] + (1 - c^2*x^2)^(3/2)*(-3*ArcSin[c*x]^ 2 + 4*Log[1 - c^2*x^2]) + 2*ArcSin[c*x]*Sin[3*ArcSin[c*x]]))/(3*c^5*d^(5/2) *(1 - c^2*x^2)*Sqrt[d - c^2*d*x^2])

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 800 vs. 2(393) = 786.

Time = 0.34 (sec) , antiderivative size = 801, normalized size of antiderivative = 1.90

method	result
default	$\frac{a^2x^3}{3c^2d(-c^2d\,x^2+d)^{\frac{3}{2}}}-\frac{a^2x}{c^4d^2\sqrt{-c^2d\,x^2+d}}+\frac{a^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{c^4d^2\sqrt{c^2d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{3c^5d^3(c^2x^2-1)}+\right.$
parts	$\frac{a^2x^3}{3c^2d(-c^2d\,x^2+d)^{\frac{3}{2}}}-\frac{a^2x}{c^4d^2\sqrt{-c^2d\,x^2+d}}+\frac{a^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{c^4d^2\sqrt{c^2d}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{3c^5d^3(c^2x^2-1)}+\right.$

[In] int(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)

[Out] 1/3*a^2*x^3/c^2/d/(-c^2*d*x^2+d)^(3/2)-a^2/c^4/d^2*x/(-c^2*d*x^2+d)^(1/2)+a ^2/c^4/d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+b^2*(-1/3*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^5/d^3/(c^2*x^2-1)*arcsin(c *x)^3+1/12*(-d*(c^2*x^2-1))^(1/2)*(-I*(-c^2*x^2+1)^(1/2)+c*x)*(-1+6*arcsin(c*x)^2-2*I*arcsin(c*x))/d^3/(c^4*x^4-2*c^2*x^2+1)/c^5-4/3*I*(-c^2*x^2+1)^(1 /2)*(-d*(c^2*x^2-1))^(1/2)*(2*I*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2)) ^2)+2*arcsin(c*x)^2+polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2))/c^5/d^3/(c^2* x^2-1)+1/12*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^ 3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(10*arcsin(c*x)^2-2*I*arcsin(c*x)-3)/d^3/(c^4

```
*x^4-2*c^2*x^2+1)/c^5-1/12*(-d*(c^2*x^2-1))^(1/2)*(2*I*c*x*(-c^2*x^2+1)^(1/
2)+2*c^2*x^2-1)*(-2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)*x/c^4/(c^4*x^4-2*c^2*x
^2+1)/d^3)-1/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(3*arcsin(c*x)
^2*x^4*c^4+8*I*arcsin(c*x)*x^4*c^4-8*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*x^4
*c^4+8*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3*x^3-6*arcsin(c*x)^2*x^2*c^2-16*I*
arcsin(c*x)*x^2*c^2+16*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*x^2*c^2-6*(-c^2*x
^2+1)^(1/2)*arcsin(c*x)*x*c+c^2*x^2+3*arcsin(c*x)^2+8*I*arcsin(c*x)-8*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1)/d^3/(c^6*x^6-3*c^4*x^4+3*c^2*x^2-1)/c^5
```

Fricas [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^4}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
[Out] integral(-(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4)*sqrt(-c
^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^4(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x**4*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral(x**4*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^4}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
[Out] 1/3*(x*(3*x^2/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^
4*d)) - x/(sqrt(-c^2*d*x^2 + d)*c^4*d^2) + 3*arcsin(c*x)/(c^5*d^(5/2)))*a^2
 - sqrt(d)*integrate((b^2*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2
+ 2*a*b*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(
-c*x + 1)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^4\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((x^4*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

3.256 $\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 332

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{10ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{5ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{5ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}$$

```
[Out] 1/3*x^2*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2/c^4/d^2/(-c^
2*d*x^2+d)^(1/2)-2/3*(a+b*arcsin(c*x))^2/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b
*x*(a+b*arcsin(c*x))/c^3/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-10/3*I
*b*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^
4/d^2/(-c^2*d*x^2+d)^(1/2)+5/3*I*b^2*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)
))*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-5/3*I*b^2*polylog(2,I*(I
*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 332, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.241, Rules used = {4791, 4767, 4749, 4266, 2317, 2438, 267}

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{10ib\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\arcsin(cx))^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}} - \frac{2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{5ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{5ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] b^2/(3*c^4*d^2*Sqrt[d - c^2*d*x^2]) - (b*x*(a + b*ArcSin[c*x]))/(3*c^3*d^2*
Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^2*(a + b*ArcSin[c*x])^2)/(3*c^2
*d*(d - c^2*d*x^2)^(3/2)) - (2*(a + b*ArcSin[c*x])^2)/(3*c^4*d^2*Sqrt[d - c
^2*d*x^2]) - (((10*I)/3)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(
I*ArcSin[c*x])])/(c^4*d^2*Sqrt[d - c^2*d*x^2]) + (((5*I)/3)*b^2*Sqrt[1 - c^
2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^4*d^2*Sqrt[d - c^2*d*x^2]) -
(((5*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^4*d^2*
Sqrt[d - c^2*d*x^2])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{x^2(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx}{3c^2d} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x^2(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}} \\
&= -\frac{bx(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} \\
&\quad - \frac{2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(b\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{3c^3d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(4b\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{3c^3d^2\sqrt{d-c^2dx^2}} + \frac{\left(b^2\sqrt{1-c^2x^2}\right)\int \frac{x}{(1-c^2x^2)^{3/2}}\,dx}{3c^2d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= \frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(4b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{10ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{\left(4b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(4b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c^4d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{10ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{\left(ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{\left(4ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{\left(4ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\arcsin(cx))}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^2(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} - \frac{2(a+b\arcsin(cx))^2}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{10ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}} + \frac{5ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}} - \frac{5ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^4d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 0.83 (sec) , antiderivative size = 511, normalized size of antiderivative = 1.54

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{8a^2-2b^2-12a^2c^2x^2+4ab\arcsin(cx)+2b^2\arcsin(cx)^2-2b^2\cos(2\arcsin(cx))}{}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (8*a^2 - 2*b^2 - 12*a^2*c^2*x^2 + 4*a*b*ArcSin[c*x] + 2*b^2*ArcSin[c*x]^2 -
 2*b^2*Cos[2*ArcSin[c*x]] + 12*a*b*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 6*b^2*A
rcSin[c*x]^2*Cos[2*ArcSin[c*x]] - 15*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[
1 - I*E^(I*ArcSin[c*x])] - 5*b^2*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 - I*E
^(I*ArcSin[c*x])] + 15*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*Arc
Sin[c*x])] + 5*b^2*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x
])] + 15*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]
 + 5*a*b*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] -
15*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 5*a
*b*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - (20*I)
*b^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (20*I)*b^2*(1
 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])] + 2*a*b*Sin[2*ArcSin[c*x]
] + 2*b^2*ArcSin[c*x]*Sin[2*ArcSin[c*x]])/(12*c^4*d^2*(-1 + c^2*x^2)*Sqrt[d
 - c^2*d*x^2])
```

Maple [A] (verified)

Time = 0.21 (sec) , antiderivative size = 505, normalized size of antiderivative = 1.52

method	result
default	$a^2\left(\frac{x^2}{c^2d(-c^2dx^2+d)^{\frac{3}{2}}}-\frac{2}{3dc^4(-c^2dx^2+d)^{\frac{3}{2}}}\right)+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\left(3\arcsin(cx)^2x^2c^2-\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-c^2x^2-2\,\text{arc}\right.}{3(c^2x^2-1)^2d^3c^4}\right.$
parts	$a^2\left(\frac{x^2}{c^2d(-c^2dx^2+d)^{\frac{3}{2}}}-\frac{2}{3dc^4(-c^2dx^2+d)^{\frac{3}{2}}}\right)+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\left(3\arcsin(cx)^2x^2c^2-\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-c^2x^2-2\,\text{arc}\right.}{3(c^2x^2-1)^2d^3c^4}\right.$

```
[In] int(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(x^2/c^2/d/(-c^2*d*x^2+d)^(3/2)-2/3/d/c^4/(-c^2*d*x^2+d)^(3/2))+b^2*(1/
3*(-d*(c^2*x^2-1))^(1/2)*(3*arcsin(c*x)^2*x^2*c^2-(-c^2*x^2+1)^(1/2)*arcsin
(c*x)*x*c-c^2*x^2-2*arcsin(c*x)^2+1)/(c^2*x^2-1)^2/d^3/c^4+5/3*(-c^2*x^2+1)
^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)
))-arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-I*dilog(1+I*(I*c*x+(-c^2*
x^2+1)^(1/2)))+I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))))/d^3/(c^2*x^2-1)/c^4
)+2*a*b*(1/6*(-d*(c^2*x^2-1))^(1/2)*(6*c^2*x^2*arcsin(c*x)-c*x*(-c^2*x^2+1)
^(1/2)-4*arcsin(c*x))/(c^2*x^2-1)^2/d^3/c^4-5/6*(-c^2*x^2+1)^(1/2)*(-d*(c^2
*x^2-1))^(1/2)/d^3/(c^2*x^2-1)/c^4*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)+5/6*(-c^2
*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)/c^4*ln(I*c*x+(-c^2*x^2
+1)^(1/2)-I))
```

Fricas [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(b\arcsin(cx)+a)^2x^3}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-(b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3)*sqrt(-c
^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{x^3(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**3*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^3}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")

[Out] 1/6*a*b*c*(2*x/(c^6*d^(5/2)*x^2 - c^4*d^(5/2)) + 5*log(c*x + 1)/(c^5*d^(5/2
)) - 5*log(c*x - 1)/(c^5*d^(5/2))) + 2/3*a*b*(3*x^2/((-c^2*d*x^2 + d)^(3/2)
*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d))*arcsin(c*x) + 1/3*a^2*(3*x^2/((
-c^2*d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d)) + b^2*inte
grate(x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^4*d^2*x^4 - 2*c^
2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate(x^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^3\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

[In] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)

[Out] int((x^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)

3.257 $\int \frac{x^2(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 332

$$\begin{aligned}\int \frac{x^2(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx &= \frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3d^2\sqrt{d-c^2dx^2}}\\ &-\frac{bx^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}\\ &+\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}\\ &+\frac{ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] 1/3*x^3*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2*x/c^2/d^2/(-c^2*
d*x^2+d)^(1/2)-1/3*b*x^2*(a+b*arcsin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d
*x^2+d)^(1/2)-1/3*b^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)
^(1/2)+1/3*I*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^
(1/2)-2/3*b*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+
1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*I*b^2*polylog(2,-(I*c*x+(-c^2*x^2
+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 332, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.310$, Rules used = {4771, 4791, 4765, 3800, 2221, 2317, 2438, 294, 222}

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{bx^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\arcsin(cx))^2}{3d\,(d-c^2dx^2)^{3/2}} +\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{2b\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c^3d^2\sqrt{d-c^2dx^2}} +\frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3d^2\sqrt{d-c^2dx^2}}+\frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (b^2*x)/(3*c^2*d^2*Sqrt[d - c^2*d*x^2]) - (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x
])/(3*c^3*d^2*Sqrt[d - c^2*d*x^2]) - (b*x^2*(a + b*ArcSin[c*x]))/(3*c*d^2*S
qrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x^3*(a + b*ArcSin[c*x])^2)/(3*d*(d
 - c^2*d*x^2)^(3/2)) + ((I/3)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^3
*d^2*Sqrt[d - c^2*d*x^2]) - (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[
1 + E^((2*I)*ArcSin[c*x])])/(3*c^3*d^2*Sqrt[d - c^2*d*x^2]) + ((I/3)*b^2*Sq
rt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^3*d^2*Sqrt[d - c^2*d
*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 294

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(
n - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*n*(p + 1))), x] - Dist[c^n
*((m - n + 1)/(b*n*(p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rubi steps

$$\text{integral} = \frac{x^3(a+b\arcsin(cx))^2}{3d\,(d-c^2dx^2)^{3/2}} - \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{x^3(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$=-\frac{bx^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{\left(b^2\sqrt{1-c^2x^2}\right)\int\frac{x^2}{(1-c^2x^2)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}}+\frac{\left(2b\sqrt{1-c^2x^2}\right)\int\frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}$$

$$=\frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{bx^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{\left(2b\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{\left(b^2\sqrt{1-c^2x^2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{3c^2d^2\sqrt{d-c^2dx^2}}$$

$$=\frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{bx^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{\left(4ib\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{3c^3d^2\sqrt{d-c^2dx^2}}$$

$$=\frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{bx^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}+\frac{\left(2b^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3c^3d^2\sqrt{d-c^2dx^2}}$$

$$=\frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{bx^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{x^3(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}-\frac{\left(ib^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2x}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bx^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x^3(a+b\arcsin(cx))^2}{3d\,(d-c^2dx^2)^{3/2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}} + \frac{ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 1.16 (sec) , antiderivative size = 303, normalized size of antiderivative = 0.91

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{-b^2cx-a^2c^3x^3+b^2c^3x^3+ab\sqrt{1-c^2x^2}+ib^2\left(ic^3x^3-\sqrt{1-c^2x^2}+c^2x^2\sqrt{1-\right.}{}$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (-(b^2*c*x) - a^2*c^3*x^3 + b^2*c^3*x^3 + a*b*Sqrt[1 - c^2*x^2] + I*b^2*(I*
c^3*x^3 - Sqrt[1 - c^2*x^2] + c^2*x^2*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + b*
ArcSin[c*x]*(-2*a*c^3*x^3 + b*Sqrt[1 - c^2*x^2] + 2*b*(1 - c^2*x^2)^(3/2)*L
og[1 + E^((2*I)*ArcSin[c*x])]) + a*b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2] - a
*b*c^2*x^2*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2] - I*b^2*(1 - c^2*x^2)^(3/2)*P
olyLog[2, -E^((2*I)*ArcSin[c*x])])/(3*c^3*d^2*(-1 + c^2*x^2)*Sqrt[d - c^2*d
*x^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3297 vs. 2(312) = 624.

Time = 0.27 (sec) , antiderivative size = 3298, normalized size of antiderivative = 9.93

method	result	size
default	Expression too large to display	3298
parts	Expression too large to display	3298

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+
1)*c^4*arcsin(c*x)*x^7-a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+
10*c^4*x^4-5*c^2*x^2+1)*c*(-c^2*x^2+1)^(1/2)*x^4-1/3*I*a*b*(-d*(c^2*x^2-1))
^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^4*x^7-2*a*b*(-d*(
```

c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*arcs
in(c*x)*x^5+a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-
5*c^2*x^2+1)/c*(-c^2*x^2+1)^(1/2)*x^2+1/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/
(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*(-c^2*x^2+1)*x^3+2/3*I*a*b*(-d
*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*x^
5+2/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)/c^3*ln(
1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x
^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^3-1/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d
^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*(-c^2*x^2+1)*x^5-2/3*I*
a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)
/c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-4/3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x
^2-1))^(1/2)/d^3/(c^2*x^2-1)/c^3*arcsin(c*x)+a^2*(1/2*x/c^2/d/(-c^2*d*x^2+d
)^(3/2)-1/2/c^2*(1/3/d*x/(-c^2*d*x^2+d)^(3/2)+2/3/d^2*x/(-c^2*d*x^2+d)^(1/2
)))-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*
c^2*x^2+1)*c^2*(-c^2*x^2+1)*arcsin(c*x)*x^5-2*I*b^2*(-d*(c^2*x^2-1))^(1/2)/
d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c*(-c^2*x^2+1)^(1/2)*arcsi
n(c*x)^2*x^4+4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c
^4*x^4-5*c^2*x^2+1)/c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*x^2+I*b^2*(-d*(c^2*x
^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^3*(-c^2*x^2
+1)^(1/2)*arcsin(c*x)^2*x^6-2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9
*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*(-c^2*x^2+1)*x^3-2/3*b^2*(-d*(c^2*x^2-1))^
(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^4*x^7+b^2*(-d*(c^2
*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*x^5+1/3
b^2(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1
)*arcsin(c*x)^2*x^3+2*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6
+10*c^4*x^4-5*c^2*x^2+1)*c^3*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^6+8/3*I*a*b*(
-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c*(-
c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2-4*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*
x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4+
1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^
2+1)*c^2*(-c^2*x^2+1)*x^5+1/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c
^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^2*(-c^2*x^2+1)*x-1/3*b^2*(-d*(c^2*x^2-1))^
(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*(-c^2*x^2+1)^(1/
2)*arcsin(c*x)+b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x
^4-5*c^2*x^2+1)*c^4*arcsin(c*x)^2*x^7-b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8
*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^2*arcsin(c*x)^2*x^5+1/3*I*b^2*(-d*
(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*(-c
^2*x^2+1)^(1/2)-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+1
0*c^4*x^4-5*c^2*x^2+1)*arcsin(c*x)*x^3-I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*
c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*c^3*(-c^2*x^2+1)^(1/2)*x^6+2/3*I*
b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)
*c^2*arcsin(c*x)*x^5-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*
x^6+10*c^4*x^4-5*c^2*x^2+1)*c^4*arcsin(c*x)*x^7-1/3*I*a*b*(-d*(c^2*x^2-1))^
(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*x^3+2/3*a*b*(-d*(c^2
*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)*arcsin(c*x)

```
*x^3-1/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c
^2*x^2+1)/c^3*(-c^2*x^2+1)^(1/2)-1/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-
1))^(1/2)/d^3/(c^2*x^2-1)/c^3*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*I*
b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)
*c*(-c^2*x^2+1)^(1/2)*x^4-b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x
^6+10*c^4*x^4-5*c^2*x^2+1)*c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4+b^2*(-d*(c^
2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c*(-c^2*x^
2+1)^(1/2)*arcsin(c*x)*x^2+2/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2
)/d^3/(c^2*x^2-1)/c^3*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)-4/3*I*
b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)
/c*(-c^2*x^2+1)^(1/2)*x^2-1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9
*c^6*x^6+10*c^4*x^4-5*c^2*x^2+1)/c^3*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2-2/3*I
*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)/c^3*arcsin(c
*x)^2+1/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^8*x^8-9*c^6*x^6+10*c^4*x^4-
5*c^2*x^2+1)*(-c^2*x^2+1)*arcsin(c*x)*x^3
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(b\arcsin(cx)+a)^2x^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(-c
^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{x^2(a+b\,\mathrm{asin}\,(cx))^2}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] 1/3*a*b*c*(1/(c^6*d^(5/2)*x^2 - c^4*d^(5/2)) - log(c*x + 1)/(c^4*d^(5/2)) -
 log(c*x - 1)/(c^4*d^(5/2))) - 2/3*a*b*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) -
x/((-c^2*d*x^2 + d)^(3/2)*c^2*d))*arcsin(c*x) - 1/3*a^2*(x/(sqrt(-c^2*d*x^2
 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d)) + b^2*integrate(x^2*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^
2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((x^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

3.258 $\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 294

$$\begin{aligned}\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx &= \frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{bx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}\\&+\frac{(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}}+\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}\\&-\frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}+\frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] 1/3*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2/c^2/d^2/(-c^2*d*
x^2+d)^(1/2)-1/3*b*x*(a+b*arcsin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2
+d)^(1/2)+2/3*I*b*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*
x^2+1)^(1/2)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*I*b^2*polylog(2,-I*(I*c*x+(-c
^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*I*b^2
*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d^2/(-c^2*d
*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 294, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used

$= \{4767, 4747, 4749, 4266, 2317, 2438, 267\}$

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{2ib\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\arcsin(cx))^2}{3c^2d(d-c^2dx^2)^{3/2}} - \frac{ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] b^2/(3*c^2*d^2*Sqrt[d - c^2*d*x^2]) - (b*x*(a + b*ArcSin[c*x]))/(3*c*d^2*Sq
rt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*x])^2/(3*c^2*d*(d -
c^2*d*x^2)^(3/2)) + (((2*I)/3)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcT
an[E^(I*ArcSin[c*x])])/(c^2*d^2*Sqrt[d - c^2*d*x^2]) - ((I/3)*b^2*Sqrt[1 -
c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c^2*d^2*Sqrt[d - c^2*d*x^2])
+ ((I/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^2*d^2*Sq
rt[d - c^2*d*x^2])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(a+b\arcsin(cx))^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}-\frac{\left(2b\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{\left(1-c^2x^2\right)^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}\\
&=-\frac{bx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{(a+b\arcsin(cx))^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}\\
&\quad+\frac{\left(b^2\sqrt{1-c^2x^2}\right)\int\frac{x}{\left(1-c^2x^2\right)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}}-\frac{\left(b\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{3cd^2\sqrt{d-c^2dx^2}}\\
&=\frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}}-\frac{bx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{(a+b\arcsin(cx))^2}{3c^2d\left(d-c^2dx^2\right)^{3/2}}\\
&\quad-\frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{3c^2d^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= \frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} + \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c^2d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} + \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{\left(ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{\left(ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{bx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} + \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 1.80 (sec) , antiderivative size = 461, normalized size of antiderivative = 1.57

$$\int\frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{a^2\sqrt{-d\,(-1+c^2x^2)}}{3c^2d^3\,(-1+c^2x^2)^2}$$

$$+\frac{ab\left(8\arcsin(cx)+3\sqrt{1-c^2x^2}\left(\log\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)-\sin\left(\frac{1}{2}\arcsin(cx)\right)\right)-\log\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)+\sin\left(\right.\right.\right.\right.}{}$$

$$+\frac{b^2\left(2+4\arcsin(cx)^2+2\cos(2\arcsin(cx))-3\sqrt{1-c^2x^2}\arcsin(cx)\log\left(1-ie^{i\arcsin(cx)}\right)-\arcsin(cx)\cos(3\,\mathrm{a}\right.}{}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (a^2*Sqrt[-(d*(-1 + c^2*x^2))])/(3*c^2*d^3*(-1 + c^2*x^2)^2) + (a*b*(8*ArcS
in[c*x] + 3*Sqrt[1 - c^2*x^2]*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]
```

```
 - Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[3*ArcSin[c*x]]*(Log[
Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - Log[Cos[ArcSin[c*x]/2] + Sin[Arc
Sin[c*x]/2]]) - 2*Sin[2*ArcSin[c*x]]))/(12*c^2*d*(d*(1 - c^2*x^2))^(3/2)) +
 (b^2*(2 + 4*ArcSin[c*x]^2 + 2*Cos[2*ArcSin[c*x]] - 3*Sqrt[1 - c^2*x^2]*Arc
Sin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[
1 - I*E^(I*ArcSin[c*x])] + 3*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*A
rcSin[c*x])] + ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x])]
- (4*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (4*I)*(1 -
 c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])] - 2*ArcSin[c*x]*Sin[2*ArcSi
n[c*x]]))/(12*c^2*d*(d*(1 - c^2*x^2))^(3/2))
```

Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 468, normalized size of antiderivative = 1.59

method	result
default	$\frac{a^2}{3c^2d(-c^2d\,x^2+d)^{\frac{3}{2}}}+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\left(-\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-c^2x^2+\arcsin(cx)^2+1\right)}{3d^3(c^4x^4-2c^2x^2+1)c^2}-\frac{\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\,(\mathrm{ar}}{}\right.$
parts	$\frac{a^2}{3c^2d(-c^2d\,x^2+d)^{\frac{3}{2}}}+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\left(-\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-c^2x^2+\arcsin(cx)^2+1\right)}{3d^3(c^4x^4-2c^2x^2+1)c^2}-\frac{\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\,(\mathrm{ar}}{}\right.$

```
[In] int(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*a^2/c^2/d/(-c^2*d*x^2+d)^(3/2)+b^2*(1/3*(-d*(c^2*x^2-1))^(1/2)*(-(-c^2*
x^2+1)^(1/2)*arcsin(c*x)*x*c-c^2*x^2+arcsin(c*x)^2+1)/d^3/(c^4*x^4-2*c^2*x^
2+1)/c^2-1/3*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(arcsin(c*x)*ln(1+I*
(I*c*x+(-c^2*x^2+1)^(1/2)))-arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-
I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/
2))))/d^3/(c^2*x^2-1)/c^2)+2*a*b*(1/6*(-d*(c^2*x^2-1))^(1/2)*(-c*x*(-c^2*x^
2+1)^(1/2)+2*arcsin(c*x))/d^3/(c^4*x^4-2*c^2*x^2+1)/c^2+1/6*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)/c^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)+
I)-1/6*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)/c^2*ln(I*c
*x+(-c^2*x^2+1)^(1/2)-I))
```

Fricas [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(b\arcsin(cx)+a)^2x}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) +
 a^2*x)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x(a+b\,\mathrm{asin}\,(cx))^2}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -sqrt(d)*integrate((b^2*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*
a*b*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x +
 1)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x) + 1/3*a^2/((-c^
2*d*x^2 + d)^(3/2)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
[Out] int((x*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

3.259 $\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 311

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx &= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}}-\frac{b(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}\\ &+\frac{x(a+b\arcsin(cx))^2}{3d\,(d-c^2dx^2)^{3/2}}+\frac{2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{2i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}}\\ &+\frac{4b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}\\ &-\frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] 1/3*x*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2*x/d^2/(-c^2*d*x^2+
d)^(1/2)+2/3*x*(a+b*arcsin(c*x))^2/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b*(a+b*arcs
in(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2/3*I*(a+b*arcsin(c*
x))^2*(-c^2*x^2+1)^(1/2)/c/d^2/(-c^2*d*x^2+d)^(1/2)+4/3*b*(a+b*arcsin(c*x))
*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c/d^2/(-c^2*d*x^2+d)
^(1/2)-2/3*I*b^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2
)/c/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 311, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.346$, Rules used = {4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197}

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{b(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{2i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} + \frac{4b\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3cd^2\sqrt{d-c^2dx^2}} + \frac{x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} - \frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} + \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (b^2*x)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*(a + b*ArcSin[c*x]))/(3*c*d^2*Sqrt
[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (x*(a + b*ArcSin[c*x])^2)/(3*d*(d - c^
2*d*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x])^2)/(3*d^2*Sqrt[d - c^2*d*x^2]) -
 (((2*I)/3)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c*d^2*Sqrt[d - c^2*d*
x^2]) + (4*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[
c*x])])/(3*c*d^2*Sqrt[d - c^2*d*x^2]) - (((2*I)/3)*b^2*Sqrt[1 - c^2*x^2]*Po
lyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*d^2*Sqrt[d - c^2*d*x^2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\text{integral} = \frac{x(a+b\arcsin(cx))^2}{3d\,(d-c^2dx^2)^{3/2}}+\frac{2\int\frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx}{3d}-\frac{\left(2bc\sqrt{1-c^2x^2}\right)\int\frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} + \frac{\left(b^2\sqrt{1-c^2x^2}\right)\int \frac{1}{(1-c^2x^2)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}} - \frac{\left(4bc\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{\left(4b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{2i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} + \frac{\left(8ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{2i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} + \frac{4b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} - \frac{\left(4b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{2i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} + \frac{4b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} + \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{b(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{2i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} + \frac{4b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} - \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2, -e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 1.17 (sec) , antiderivative size = 320, normalized size of antiderivative = 1.03

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{-3a^2cx-b^2cx+2a^2c^3x^3+b^2c^3x^3+ab\sqrt{1-c^2x^2}+b^2\left(-3cx+2c^3x^3+2i\sqrt{1-c^2x^2}\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] (-3*a^2*c*x - b^2*c*x + 2*a^2*c^3*x^3 + b^2*c^3*x^3 + a*b*Sqrt[1 - c^2*x^2]
 + b^2*(-3*c*x + 2*c^3*x^3 + (2*I)*Sqrt[1 - c^2*x^2] - (2*I)*c^2*x^2*Sqrt[1
 - c^2*x^2])*ArcSin[c*x]^2 + b*ArcSin[c*x]*(-6*a*c*x + 4*a*c^3*x^3 + b*Sqrt
[1 - c^2*x^2] - 4*b*(1 - c^2*x^2)^(3/2)*Log[1 + E^((2*I)*ArcSin[c*x])]) - 2
*a*b*Sqrt[1 - c^2*x^2]*Log[1 - c^2*x^2] + 2*a*b*c^2*x^2*Sqrt[1 - c^2*x^2]*L
og[1 - c^2*x^2] + (2*I)*b^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin
[c*x])])/(3*c*d^2*(-1 + c^2*x^2)*Sqrt[d - c^2*d*x^2])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2894 vs. 2(293) = 586.

Time = 0.24 (sec) , antiderivative size = 2895, normalized size of antiderivative = 9.31

method	result	size
default	Expression too large to display	2895
parts	Expression too large to display	2895

```
[In] int((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 16/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c
^2*arcsin(c*x)*x^3+7/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x
^4+11*c^2*x^2-4)*c*(-c^2*x^2+1)^(1/2)*x^2-8/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/
d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2+
4/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)/c*arcsi
n(c*x)^2+2/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1
)/c*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)+2*I*b^2*(-d*(c^2*x^2-1))^(1/2)
/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*arcsin(c*x)*x+2/3*b^2
*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^6*x^7-4*b
^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*
x)^2*x+2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-
4)*(-c^2*x^2+1)*x-2*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+
11*c^2*x^2-4)*x+4/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11
*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)-8*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^
6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)*x-2*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(
```

3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*arcsin(c*x)^2*x^5+17/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(c*x)^2*x^3+2/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*(-c^2*x^2+1)*x^5-4/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*(-c^2*x^2+1)*x^3+4/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)-4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)-2*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)*x-2*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*x+a^2*(1/3/d*x/(-c^2*d*x^2+d)^(3/2)+2/3/d^2*x/(-c^2*d*x^2+d)^(1/2))-16/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-10/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*(-c^2*x^2+1)*x^3+4/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*(-c^2*x^2+1)*x^5+8/3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)/c*arcsin(c*x)-4*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^3*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4+28/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2-b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2-4/3*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)/c*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^6*arcsin(c*x)*x^7-14/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*arcsin(c*x)*x^5-I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^3*(-c^2*x^2+1)^(1/2)*x^4-10/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*(-c^2*x^2+1)*arcsin(c*x)*x^3+14/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*x^2+4/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*(-c^2*x^2+1)*arcsin(c*x)*x^5-2*I*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^3*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*x^4-3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*x^5+13/3*b^2*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*x^3+2*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*x+16/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*x^3-4/3*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)/c*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)+34/3*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(c*x)*x^3-a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2*x^2+1)^(1/2)*x^2+4/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^6*x^7-14/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*x^5-4*a*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*arcsin(c*x)*x^5

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*a*b*c*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/2))
 + 2*log(c*x - 1)/(c^2*d^(5/2))) + 2/3*a*b*(2*x/(sqrt(-c^2*d*x^2 + d)*d^2)
+ x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a^2*(2*x/(sqrt(-c^2*d*x^2
 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + b^2*integrate(arctan2(c*x, sqr
t(c*x + 1)*sqrt(-c*x + 1))^2/((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x
+ 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))^2/(d - c^2*d*x^2)^(5/2), x)
```

3.260 $\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 577

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^{5/2}}\,dx &= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}}\\
&-\frac{bcx(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{(a+b\arcsin(cx))^2}{3d(d-c^2dx^2)^{3/2}}+\frac{(a+b\arcsin(cx))^2}{d^2\sqrt{d-c^2dx^2}}\\
&+\frac{14ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}\\
&-\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}\\
&+\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}\\
&-\frac{7ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}\\
&+\frac{7ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}\\
&-\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}\\
&-\frac{2b^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}+\frac{2b^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] 1/3*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2/d^2/(-c^2*d*x^2+d)^(
1/2)+(a+b*arcsin(c*x))^2/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b*c*x*(a+b*arcsin(c*x
))/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+14/3*I*b*(a+b*arcsin(c*x))*a
rctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)
```

```
-2*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)
/d^2/(-c^2*d*x^2+d)^(1/2)+2*I*b*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^
2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-7/3*I*b^2*polylog(2
,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)
+7/3*I*b^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d^2/(
-c^2*d*x^2+d)^(1/2)-2*I*b*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1
/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-2*b^2*polylog(3,-I*c*x-(-c
^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)+2*b^2*polylog(
3,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 577, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.414$, Rules used = {4793, 4803, 4268, 2611, 2320, 6724, 4749, 4266, 2317, 2438, 4747, 267}

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x\left(d-c^2dx^2\right)^{5/2}}\,dx &= \frac{14ib\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}}\\
&-\frac{2\sqrt{1-c^2x^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{d^2\sqrt{d-c^2dx^2}}\\
&+\frac{2ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2\sqrt{d-c^2dx^2}}\\
&-\frac{2ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2\sqrt{d-c^2dx^2}}\\
&-\frac{bcx(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{(a+b\arcsin(cx))^2}{d^2\sqrt{d-c^2dx^2}}\\
&+\frac{(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}-\frac{7ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}\\
&+\frac{7ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}-\frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}\\
&+\frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}+\frac{b^2}{3d^2\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] b^2/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*c*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[1
 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (a + b*ArcSin[c*x])^2/(3*d*(d - c^2*d*x^
2)^(3/2)) + (a + b*ArcSin[c*x])^2/(d^2*Sqrt[d - c^2*d*x^2]) + (((14*I)/3)*b
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d^2*Sqrt
[d - c^2*d*x^2]) - (2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*
ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) -
```

```
(((7*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(d^2*S
qrt[d - c^2*d*x^2]) + (((7*I)/3)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (2*
b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x
^2]) + (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d^2*Sqrt[d
- c^2*d*x^2])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
```

```
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^{3/2}}\,dx}{d}-\frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}\\
&=-\frac{bcx(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}+\frac{(a+b\arcsin(cx))^2}{d^2\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx}{d^2}-\frac{\left(bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{d^2\sqrt{d-c^2dx^2}}+\frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\int \frac{x}{(1-c^2x^2)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}}\\
&=\frac{b^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{bcx(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}+\frac{(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}\\
&\quad+\frac{(a+b\arcsin(cx))^2}{d^2\sqrt{d-c^2dx^2}}+\frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int (a+bx)^2\csc(x)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{3d^2\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} \\
&+ \frac{(a+b\arcsin(cx))^2}{d^2\sqrt{d-c^2dx^2}} + \frac{14ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&- \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&- \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&- \frac{\left(b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} \\
&- \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} \\
&\quad + \frac{(a+b\arcsin(cx))^2}{d^2\sqrt{d-c^2dx^2}} + \frac{14ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(ib^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(ib^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}$$
$$+ \frac{(a+b\arcsin(cx))^2}{d^2\sqrt{d-c^2dx^2}} + \frac{14ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{7ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{7ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\text{PolyLog}(2,-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\text{PolyLog}(2,x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bcx(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}$$
$$+ \frac{(a+b\arcsin(cx))^2}{d^2\sqrt{d-c^2dx^2}} + \frac{14ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{7ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{7ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} + \frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (warning: unable to verify)

Time = 8.74 (sec) , antiderivative size = 935, normalized size of antiderivative = 1.62

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(d-c^2dx^2)^{5/2}}\,dx = \sqrt{-d\,(-1+c^2x^2)}\left(\frac{a^2}{3d^3\,(-1+c^2x^2)^2}-\frac{a^2}{d^3\,(-1+c^2x^2)}\right)$$

$$+\frac{a^2\log(cx)}{d^{5/2}}-\frac{a^2\log\left(d+\sqrt{d}\sqrt{-d\,(-1+c^2x^2)}\right)}{d^{5/2}}$$

$$+\frac{b^2(1-c^2x^2)^{3/2}\left(4-\frac{(-2+\arcsin(cx))\arcsin(cx)}{-1+cx}+14\arcsin(cx)^2+12\arcsin(cx)^2\left(\log\left(1-e^{i\arcsin(cx)}\right)-\log\left(1+\right.\right.\right.}{}$$

$$+\frac{ab\left(20\arcsin(cx)+12\arcsin(cx)\cos(2\arcsin(cx))+18\sqrt{1-c^2x^2}\arcsin(cx)\log\left(1-e^{i\arcsin(cx)}\right)+6\arcsin(\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*(a^2/(3*d^3*(-1 + c^2*x^2)^2) - a^2/(d^3*(-1 + c^
2*x^2))) + (a^2*Log[c*x])/d^(5/2) - (a^2*Log[d + Sqrt[d]*Sqrt[-(d*(-1 + c^2
*x^2))]])/d^(5/2) + (b^2*(1 - c^2*x^2)^(3/2)*(4 - ((-2 + ArcSin[c*x])*ArcSi
n[c*x])/(-1 + c*x) + 14*ArcSin[c*x]^2 + 12*ArcSin[c*x]^2*(Log[1 - E^(I*ArcS
in[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) - 28*(ArcSin[c*x]*(Log[1 - I*E^(I*A
rcSin[c*x])] - Log[1 + I*E^(I*ArcSin[c*x])]) + I*(PolyLog[2, (-I)*E^(I*ArcS
in[c*x])] - PolyLog[2, I*E^(I*ArcSin[c*x])])) + (24*I)*ArcSin[c*x]*(PolyLog
[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]) + 24*(-PolyLog[3,
-E^(I*ArcSin[c*x])] + PolyLog[3, E^(I*ArcSin[c*x])]) + (2*ArcSin[c*x]^2*Sin
[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + (2*(2 + 7*Ar
cSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])
- (2*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x
]/2])^3 + (ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[
c*x]/2])^2 - (2*(2 + 7*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/
2] + Sin[ArcSin[c*x]/2])))/(12*d*(d*(1 - c^2*x^2))^(3/2)) + (a*b*(20*ArcSin
[c*x] + 12*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 18*Sqrt[1 - c^2*x^2]*ArcSin[c*x
]*Log[1 - E^(I*ArcSin[c*x])] + 6*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 - E^(
I*ArcSin[c*x])] - 18*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + E^(I*ArcSin[c*x]
)] - 6*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + E^(I*ArcSin[c*x])] + 21*Sqrt[
1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 7*Cos[3*ArcSin[
c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 21*Sqrt[1 - c^2*x^2]*L
og[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 7*Cos[3*ArcSin[c*x]]*Log[Cos[
ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + (24*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2
, -E^(I*ArcSin[c*x])] - (24*I)*(1 - c^2*x^2)^(3/2)*PolyLog[2, E^(I*ArcSin[c
*x])] - 2*Sin[2*ArcSin[c*x]]))/(12*d*(d*(1 - c^2*x^2))^(3/2))
```

Maple [A] (verified)

Time = 0.38 (sec) , antiderivative size = 924, normalized size of antiderivative = 1.60

method	result
default	$\frac{a^2}{3d(-c^2dx^2+d)^{\frac{3}{2}}}+\frac{a^2}{d^2\sqrt{-c^2dx^2+d}}-\frac{a^2\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)}{d^{\frac{5}{2}}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(3\arcsin(cx)^2x^2c^2+\sqrt{-c^2x^2+1}\right.}{3(c^2x^2-1)^2}\right.$
parts	$\frac{a^2}{3d(-c^2dx^2+d)^{\frac{3}{2}}}+\frac{a^2}{d^2\sqrt{-c^2dx^2+d}}-\frac{a^2\ln\left(\frac{2d+2\sqrt{d}\sqrt{-c^2dx^2+d}}{x}\right)}{d^{\frac{5}{2}}}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\left(3\arcsin(cx)^2x^2c^2+\sqrt{-c^2x^2+1}\right.}{3(c^2x^2-1)^2}\right.$

```
[In] int((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*a^2/d/(-c^2*d*x^2+d)^(3/2)+a^2/d^2/(-c^2*d*x^2+d)^(1/2)-a^2/d^(5/2)*ln(
(2*d+2*d^(1/2)*(-c^2*d*x^2+d)^(1/2))/x)+b^2*(-1/3*(-d*(c^2*x^2-1))^(1/2)*(3
*arcsin(c*x)^2*x^2*c^2+(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c+c^2*x^2-4*arcsin(
c*x)^2-1)/(c^2*x^2-1)^2/d^3-1/3*I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)
*(3*I*arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-3*I*arcsin(c*x)^2*ln(1-I
*c*x-(-c^2*x^2+1)^(1/2))-7*I*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))
+7*I*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+6*arcsin(c*x)*polylog(2
,-I*c*x-(-c^2*x^2+1)^(1/2))-6*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2
))+6*I*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))-6*I*polylog(3,I*c*x+(-c^2*x^2+1
)^(1/2))-7*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+7*dilog(1-I*(I*c*x+(-c^2*x
^2+1)^(1/2))))/d^3/(c^2*x^2-1))-1/3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1
))^(1/2)*(6*I*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2*c^2+6*dilog(1+I*c*x+(-c^2*
x^2+1)^(1/2))*c^4*x^4+6*dilog(I*c*x+(-c^2*x^2+1)^(1/2))*c^4*x^4+14*arctan(I
*c*x+(-c^2*x^2+1)^(1/2))*c^4*x^4-I*x^3*c^3-8*I*(-c^2*x^2+1)^(1/2)*arcsin(c*
x)+I*c*x-12*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))*c^2*x^2-12*dilog(I*c*x+(-c^2*
x^2+1)^(1/2))*c^2*x^2-28*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*c^2*x^2+6*I*arcsi
n(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))*x^4*c^4+6*I*arcsin(c*x)*ln(1+I*c*x+(-
c^2*x^2+1)^(1/2))-12*I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))*x^2*c^2+6
*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+6*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+14*arc
tan(I*c*x+(-c^2*x^2+1)^(1/2)))/(c^6*x^6-3*c^4*x^4+3*c^2*x^2-1)/d^3
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{x(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral((a + b*asin(c*x))**2/(x*(-d*(c*x - 1)*(c*x + 1))**(5/2)), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima")
[Out] -1/3*a^2*(3*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^(5/2)
 - 3/(sqrt(-c^2*d*x^2 + d)*d^2) - 1/((-c^2*d*x^2 + d)^(3/2)*d)) - sqrt(d)*i
ntegrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d^3*x
^7 - 3*c^4*d^3*x^5 + 3*c^2*d^3*x^3 - d^3*x), x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(5/2)*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(c\,x))^2}{x\,(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^(5/2)),x)
[Out] int((a + b*asin(c*x))^2/(x*(d - c^2*d*x^2)^(5/2)), x)
```

3.261 $\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 452

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^{5/2}}\,dx = \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{dx(d-c^2dx^2)^{3/2}} + \frac{4c^2x(a+b\arcsin(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{8c^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{8ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} + \frac{16bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} - \frac{5ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} - \frac{ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$

```
[Out] -(a+b*arcsin(c*x))^2/d/x/(-c^2*d*x^2+d)^(3/2)+4/3*c^2*x*(a+b*arcsin(c*x))^2
/d/(-c^2*d*x^2+d)^(3/2)+1/3*b^2*c^2*x/d^2/(-c^2*d*x^2+d)^(1/2)+8/3*c^2*x*(a
+b*arcsin(c*x))^2/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b*c*(a+b*arcsin(c*x))/d^2/(-
c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-8/3*I*c*(a+b*arcsin(c*x))^2*(-c^2*x^2
+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-4*b*c*(a+b*arcsin(c*x))*arctanh((I*c*x+(
-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)+16/3*b*c*
(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d^2
/(-c^2*d*x^2+d)^(1/2)-5/3*I*b^2*c*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*
(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-I*b^2*c*polylog(2,(I*c*x+(-c^2*
x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 452, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.483$, Rules used = {4789, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 4793, 4769, 4504, 4268}

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^{5/2}}\,dx = -\frac{4bc\sqrt{1-c^2x^2}\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{8c^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{8ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} + \frac{16bc\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} + \frac{4c^2x(a+b\arcsin(cx))^2}{3d(d-c^2dx^2)^{3/2}} - \frac{(a+b\arcsin(cx))^2}{dx(d-c^2dx^2)^{3/2}} - \frac{5ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} - \frac{ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} + \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] (b^2*c^2*x)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*c*(a + b*ArcSin[c*x]))/(3*d^2*
Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) - (a + b*ArcSin[c*x])^2/(d*x*(d - c^
2*d*x^2)^(3/2)) + (4*c^2*x*(a + b*ArcSin[c*x])^2)/(3*d*(d - c^2*d*x^2)^(3/2
)) + (8*c^2*x*(a + b*ArcSin[c*x])^2)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((8*I)/
3)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(d^2*Sqrt[d - c^2*d*x^2]) - (
4*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])
/(d^2*Sqrt[d - c^2*d*x^2]) + (16*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*
Log[1 + E^((2*I)*ArcSin[c*x])])/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((5*I)/3)*b^
2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(d^2*Sqrt[d - c^2
*d*x^2]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(d
^2*Sqrt[d - c^2*d*x^2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
```

```
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
```

```
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
```

```
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(a+b\arcsin(cx))^2}{dx\left(d-c^2dx^2\right)^{3/2}} \\
&\quad + \left(4c^2\right)\int \frac{(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{x\left(1-c^2x^2\right)^2}\,dx}{d^2\sqrt{d-c^2dx^2}} \\
&= \frac{bc(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} \\
&\quad + \frac{\left(8c^2\right)\int \frac{(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx}{3d} + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{x\left(1-c^2x^2\right)}\,dx}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\int \frac{1}{\left(1-c^2x^2\right)^{3/2}}\,dx}{d^2\sqrt{d-c^2dx^2}} - \frac{\left(8bc^3\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}} \\
&= -\frac{b^2c^2x}{d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{dx\left(d-c^2dx^2\right)^{3/2}} \\
&\quad + \frac{4c^2x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{8c^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\csc(x)\sec(x)\,dx, x, \arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(4b^2c^2\sqrt{1-c^2x^2}\right)\int \frac{1}{\left(1-c^2x^2\right)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}} - \frac{\left(16bc^3\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3d^2\sqrt{d-c^2dx^2}} \\
&= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{dx\left(d-c^2dx^2\right)^{3/2}} \\
&\quad + \frac{4c^2x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} + \frac{8c^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(4bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\csc(2x)\,dx, x, \arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(16bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{3d^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{(a+b\arcsin(cx))^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} \\
&\quad + \frac{8c^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{8ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(32ibc\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(2b^2c\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(2b^2c\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{(a+b\arcsin(cx))^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} \\
&\quad + \frac{8c^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{8ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{16bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(ib^2c\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(ib^2c\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(16b^2c\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&- \frac{(a+b\arcsin(cx))^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} \\
&+ \frac{8c^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{8ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} \\
&- \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{16bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&- \frac{ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{\left(8ib^2c\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{b^2c^2x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&- \frac{(a+b\arcsin(cx))^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{4c^2x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}} \\
&+ \frac{8c^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{8ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} \\
&- \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{16bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&- \frac{5ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&- \frac{ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 2.98 (sec) , antiderivative size = 352, normalized size of antiderivative = 0.78

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d-c^2dx^2)^{5/2}}\,dx =$$
$$-\frac{c\left(\frac{a^2(3-12c^2x^2+8c^4x^4)}{cx}+\frac{2ab(3-12c^2x^2+8c^4x^4)\arcsin(cx)}{cx}+ab\sqrt{1-c^2x^2}(1+6(-1+c^2x^2)\log(cx)+5(-1+c^2x^2)\log\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/3*(c*((a^2*(3 - 12*c^2*x^2 + 8*c^4*x^4))/(c*x) + (2*a*b*(3 - 12*c^2*x^2
+ 8*c^4*x^4)*ArcSin[c*x])/(c*x) + a*b*Sqrt[1 - c^2*x^2]*(1 + 6*(-1 + c^2*x^
2)*Log[c*x] + 5*(-1 + c^2*x^2)*Log[1 - c^2*x^2]) - b^2*(1 - c^2*x^2)^(3/2)*
((c*x)/Sqrt[1 - c^2*x^2] + ArcSin[c*x]/(-1 + c^2*x^2) - (8*I)*ArcSin[c*x]^2
 + (c*x*ArcSin[c*x]^2)/(1 - c^2*x^2)^(3/2) + (5*c*x*ArcSin[c*x]^2)/Sqrt[1 -
 c^2*x^2] - (3*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(c*x) + 6*ArcSin[c*x]*Log[1
 - E^((2*I)*ArcSin[c*x])] + 10*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] -
 (5*I)*PolyLog[2, -E^((2*I)*ArcSin[c*x])] - (3*I)*PolyLog[2, E^((2*I)*ArcSi
n[c*x])])))/(d*(d - c^2*d*x^2)^(3/2))
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3772 vs. 2(443) = 886.

Time = 0.31 (sec) , antiderivative size = 3773, normalized size of antiderivative = 8.35

method	result	size
default	Expression too large to display	3773
parts	Expression too large to display	3773

```
[In] int((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -64/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*
x^4*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*c^5+40*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8
*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*(-c^2*x^2+1)*arcsin(c*x)*c^4+136/
3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^2*
(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*c^3-8*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*
x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*(-c^2*x^2+1)*arcsin(c*x)*c^2+64/3*I*b^2*
(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^7*(-c^2*x^
2+1)*arcsin(c*x)*c^8-160/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x
^4+26*c^2*x^2-9)/d^3*x^5*(-c^2*x^2+1)*arcsin(c*x)*c^6-10/3*a*b*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2
```

))^2)*c-8/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/
d^3*x^2*(-c^2*x^2+1)^(1/2)*c^3+112*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25
*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*arcsin(c*x)*c^4-88*a*b*(-d*(c^2*x^2-1))^(1/2
)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*arcsin(c*x)*c^2-2*a*b*(-d*(c^2*
x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/(c^2*x^2-1)*ln((I*c*x+(-c^2*x^2+1)^(1/
2))^2-1)*c-224/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*
x^2-9)/d^3*x^7*c^8+280/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4
+26*c^2*x^2-9)/d^3*x^5*c^6-48*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^
4*x^4+26*c^2*x^2-9)/d^3*x^3*c^4+8*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-2
5*c^4*x^4+26*c^2*x^2-9)/d^3*x*c^2-128/3*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x
^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^5*arcsin(c*x)*c^6+64/3*I*a*b*(-d*(c^2*x^2
-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^9*c^10-48*I*b^2*(-d*(c
^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*arcsin(c*x)*c^
4+280/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^
3*x^5*arcsin(c*x)*c^6+64/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x
^4+26*c^2*x^2-9)/d^3*x^9*arcsin(c*x)*c^10+17/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)
/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^2*(-c^2*x^2+1)^(1/2)*c^3+8*I*b^2
(-d(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*arcsin(c*
x)*c^2+16/3*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)
*c*arcsin(c*x)^2-8/3*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*
c^2*x^2-9)/d^3*x^4*(-c^2*x^2+1)^(1/2)*c^5+a^2*(-1/d/x/(-c^2*d*x^2+d)^(3/2)+
4*c^2*(1/3/d*x/(-c^2*d*x^2+d)^(3/2)+2/3/d^2*x/(-c^2*d*x^2+d)^(1/2)))+18*a*b
(-d(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3/x*arcsin(c*
x)+3*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*(-c
^2*x^2+1)^(1/2)*c+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^
2*x^2-1)*c*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+5/3*I*b^2*(-c^2*x^2+1)^(1/2
)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c*polylog(2,-(I*c*x+(-c^2*x^2+1)^(
1/2))^2)+2*I*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*
c*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-24*I*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^
6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2*c-8/3*b
^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^2*(-c^2
*x^2+1)^(1/2)*arcsin(c*x)*c^3-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/
2)/d^3/(c^2*x^2-1)*c*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-10/3*b^2*(-
c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-1)*c*arcsin(c*x)*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))^2)-2*b^2*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/
2)/d^3/(c^2*x^2-1)*c*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-224/3*I*b^2
(-d(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^7*arcsin(
c*x)*c^8+32/3*I*a*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^3/(c^2*x^2-
1)*arcsin(c*x)*c-160/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+2
6*c^2*x^2-9)/d^3*x^5*(-c^2*x^2+1)*c^6+64/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*
c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^7*(-c^2*x^2+1)*c^8+40*I*a*b*(-d*(c^2
*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*(-c^2*x^2+1)*c^4
-8*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*(
-c^2*x^2+1)*c^2-48*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^
2*x^2-9)/d^3*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c-128/3*I*a*b*(-d*(c^2*x^2-1))^

```
(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^4*(-c^2*x^2+1)^(1/2)*arcsin
(c*x)*c^5+272/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x
^2-9)/d^3*x^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3-40*b^2*(-d*(c^2*x^2-1))^(1
/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^7*c^8+160/3*b^2*(-d*(c^2*x^2-
1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^5*c^6-29*b^2*(-d*(c^2*x
^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*c^4+5*b^2*(-d*(c^2
*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*c^2+9*b^2*(-d*(c^2
*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3/x*arcsin(c*x)^2+32/3
*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^9*c^1
0+3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*arcs
in(c*x)*(-c^2*x^2+1)^(1/2)*c-64/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*
c^4*x^4+26*c^2*x^2-9)/d^3*x^5*arcsin(c*x)^2*c^6+56*b^2*(-d*(c^2*x^2-1))^(1/
2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*arcsin(c*x)^2*c^4-44*b^2*(-d
*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*arcsin(c*x)^2
*c^2-88/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^
3*x^5*(-c^2*x^2+1)*c^6+32/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^
4+26*c^2*x^2-9)/d^3*x^7*(-c^2*x^2+1)*c^8+80/3*b^2*(-d*(c^2*x^2-1))^(1/2)/(8
*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x^3*(-c^2*x^2+1)*c^4-8*b^2*(-d*(c^2*x
^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*x*(-c^2*x^2+1)*c^2-3*I
*b^2*(-d*(c^2*x^2-1))^(1/2)/(8*c^6*x^6-25*c^4*x^4+26*c^2*x^2-9)/d^3*(-c^2*x
^2+1)^(1/2)*c
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^8 - 3*c^4*d^3*x^6 + 3*c^2*d^3*x^4 - d^3*x^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}{x^2\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**2*(-d*(c*x - 1)*(c*x + 1))**(5/2)), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")

[Out] 1/3*a^2*(8*c^2*x/(sqrt(-c^2*d*x^2 + d)*d^2) + 4*c^2*x/((-c^2*d*x^2 + d)^(3/
2)*d) - 3/((-c^2*d*x^2 + d)^(3/2)*d*x)) - sqrt(d)*integrate((b^2*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d^3*x^8 - 3*c^4*d^3*x^6 + 3*c
^2*d^3*x^4 - d^3*x^2), x)

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^2}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/x^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(5/2)*x^2), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}{x^2\,\left(d-c^2\,d\,x^2\right)^{5/2}}\,dx$$

[In] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^(5/2)),x)

[Out] int((a + b*asin(c*x))^2/(x^2*(d - c^2*d*x^2)^(5/2)), x)

3.262 $\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 752

$$
\begin{aligned}
\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^{5/2}}\,dx &= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&+ \frac{2bc^3x(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\arcsin(cx))^2}{6d(d-c^2dx^2)^{3/2}} - \frac{(a+b\arcsin(cx))^2}{2dx^2(d-c^2dx^2)^{3/2}} \\
&+ \frac{5c^2(a+b\arcsin(cx))^2}{2d^2\sqrt{d-c^2dx^2}} + \frac{26ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&- \frac{5c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&- \frac{b^2c^2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{5ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&- \frac{13ib^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{13ib^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&- \frac{5ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&- \frac{5b^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{5b^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

```
[Out] 5/6*c^2*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(3/2)-1/2*(a+b*arcsin(c*x))^2/
d/x^2/(-c^2*d*x^2+d)^(3/2)+1/3*b^2*c^2/d^2/(-c^2*d*x^2+d)^(1/2)+5/2*c^2*(a+
b*arcsin(c*x))^2/d^2/(-c^2*d*x^2+d)^(1/2)-b*c*(a+b*arcsin(c*x))/d^2/x/(-c^2
*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+2/3*b*c^3*x*(a+b*arcsin(c*x))/d^2/(-c^2*
x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+26/3*I*b*c^2*(a+b*arcsin(c*x))*arctan(I*c
*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-5*c^2*(a
+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/
(-c^2*d*x^2+d)^(1/2)-b^2*c^2*arctanh((-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)
/d^2/(-c^2*d*x^2+d)^(1/2)+5*I*b*c^2*(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^
2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-13/3*I*b^2*c^2*
polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2
+d)^(1/2)+13/3*I*b^2*c^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+
1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-5*I*b*c^2*(a+b*arcsin(c*x))*polylog(2,I*c
*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-5*b^2*c^
2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d
)^(1/2)+5*b^2*c^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d^
2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.79 (sec) , antiderivative size = 752, normalized size of antiderivative = 1.00, number of steps used = 38, number of rules used = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.586$, Rules used = {4789, 4793, 4803, 4268, 2611, 2320, 6724, 4749, 4266, 2317, 2438, 4747, 267, 272,

53, 65, 214}

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{26ibc^2\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} - \frac{5c^2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{d^2\sqrt{d-c^2dx^2}} + \frac{5ibc^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2\sqrt{d-c^2dx^2}} - \frac{5ibc^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\arcsin(cx))^2}{2d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\arcsin(cx))^2}{6d\left(d-c^2dx^2\right)^{3/2}} - \frac{(a+b\arcsin(cx))^2}{2dx^2\left(d-c^2dx^2\right)^{3/2}} + \frac{2bc^3x(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{13ib^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} + \frac{13ib^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} - \frac{5b^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} + \frac{5b^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} - \frac{b^2c^2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2\sqrt{d-c^2dx^2}} + \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] (b^2*c^2)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (b*c*(a + b*ArcSin[c*x]))/(d^2*x*Sq
rt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (2*b*c^3*x*(a + b*ArcSin[c*x]))/(3*d
^2*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]) + (5*c^2*(a + b*ArcSin[c*x])^2)/(
6*d*(d - c^2*d*x^2)^(3/2)) - (a + b*ArcSin[c*x])^2/(2*d*x^2*(d - c^2*d*x^2)
^(3/2)) + (5*c^2*(a + b*ArcSin[c*x])^2)/(2*d^2*Sqrt[d - c^2*d*x^2]) + (((26
*I)/3)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])
])/(d^2*Sqrt[d - c^2*d*x^2]) - (5*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
^2*ArcTanh[E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (b^2*c^2*Sqrt[1
- c^2*x^2]*ArcTanh[Sqrt[1 - c^2*x^2]])/(d^2*Sqrt[d - c^2*d*x^2]) + ((5*I)*b
*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/
(d^2*Sqrt[d - c^2*d*x^2]) - (((13*I)/3)*b^2*c^2*Sqrt[1 - c^2*x^2]*PolyLog[2
, (-I)*E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) + (((13*I)/3)*b^2*c^2*
Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]
) - ((5*I)*b*c^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcS
in[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (5*b^2*c^2*Sqrt[1 - c^2*x^2]*PolyLog
[3, -E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) + (5*b^2*c^2*Sqrt[1 - c^
2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2])
```

Rule 53

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = -\frac{(a+b\arcsin(cx))^2}{2dx^2\left(d-c^2dx^2\right)^{3/2}} + \frac{1}{2}\left(5c^2\right)\int\frac{(a+b\arcsin(cx))^2}{x\left(d-c^2dx^2\right)^{5/2}}\,dx + \frac{\left(bc\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{x^2\left(1-c^2x^2\right)^2}\,dx}{d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\arcsin(cx))^2}{6d\left(d-c^2dx^2\right)^{3/2}} - \frac{(a+b\arcsin(cx))^2}{2dx^2\left(d-c^2dx^2\right)^{3/2}} + \frac{(5c^2)\int\frac{(a+b\arcsin(cx))^2}{x(d-c^2dx^2)^{3/2}}\,dx}{2d} + \frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\int\frac{1}{x(1-c^2x^2)^{3/2}}\,dx}{d^2\sqrt{d-c^2dx^2}} - \frac{\left(5bc^3\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}} + \frac{\left(3bc^3\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{(1-c^2x^2)^2}\,dx}{d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2bc^3x(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\arcsin(cx))^2}{6d\left(d-c^2dx^2\right)^{3/2}} - \frac{(a+b\arcsin(cx))^2}{2dx^2\left(d-c^2dx^2\right)^{3/2}} + \frac{5c^2(a+b\arcsin(cx))^2}{2d^2\sqrt{d-c^2dx^2}} + \frac{(5c^2)\int\frac{(a+b\arcsin(cx))^2}{x\sqrt{d-c^2dx^2}}\,dx}{2d^2} + \frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{1}{x(1-c^2x)^{3/2}}\,dx,x,x^2\right)}{2d^2\sqrt{d-c^2dx^2}} - \frac{\left(5bc^3\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{6d^2\sqrt{d-c^2dx^2}} + \frac{\left(3bc^3\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{2d^2\sqrt{d-c^2dx^2}} - \frac{\left(5bc^3\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{d^2\sqrt{d-c^2dx^2}} + \frac{\left(5b^2c^4\sqrt{1-c^2x^2}\right)\int\frac{x}{(1-c^2x^2)^{3/2}}\,dx}{6d^2\sqrt{d-c^2dx^2}} - \frac{\left(3b^2c^4\sqrt{1-c^2x^2}\right)\int\frac{x}{(1-c^2x^2)^{3/2}}\,dx}{2d^2\sqrt{d-c^2dx^2}}$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2bc^3x(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{5c^2(a+b\arcsin(cx))^2}{6d\left(d-c^2dx^2\right)^{3/2}} - \frac{(a+b\arcsin(cx))^2}{2dx^2\left(d-c^2dx^2\right)^{3/2}} + \frac{5c^2(a+b\arcsin(cx))^2}{2d^2\sqrt{d-c^2dx^2}} + \frac{\left(5c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)^2\csc(x)\,dx,x,\arcsin(cx)\right)}{2d^2\sqrt{d-c^2dx^2}} - \frac{\left(5bc^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{6d^2\sqrt{d-c^2dx^2}} + \frac{\left(3bc^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{2d^2\sqrt{d-c^2dx^2}} - \frac{\left(5bc^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} + \frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2d^2\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2bc^3x(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{5c^2(a+b\arcsin(cx))^2}{6d\left(d-c^2dx^2\right)^{3/2}} - \frac{(a+b\arcsin(cx))^2}{2dx^2\left(d-c^2dx^2\right)^{3/2}} + \frac{5c^2(a+b\arcsin(cx))^2}{2d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{26ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{5c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(b^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(5bc^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int(a+bx)\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(5bc^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int(a+bx)\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(5b^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{6d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(5b^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{6d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(3b^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{2d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(3b^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{2d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(5b^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(5b^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2bc^3x(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$
$$+ \frac{5c^2(a+b\arcsin(cx))^2}{6d\left(d-c^2dx^2\right)^{3/2}} - \frac{(a+b\arcsin(cx))^2}{2dx^2\left(d-c^2dx^2\right)^{3/2}} + \frac{5c^2(a+b\arcsin(cx))^2}{2d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{26ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{5c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{b^2c^2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{5ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{5ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(5ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{6d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(5ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{6d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(3ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(3ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{2d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(5ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(5ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(5ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(5ib^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2bc^3x(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&\quad + \frac{5c^2(a+b\arcsin(cx))^2}{6d\left(d-c^2dx^2\right)^{3/2}} - \frac{(a+b\arcsin(cx))^2}{2dx^2\left(d-c^2dx^2\right)^{3/2}} + \frac{5c^2(a+b\arcsin(cx))^2}{2d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{26ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{5c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{b^2c^2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{5ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{13ib^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{13ib^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{5ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(5b^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(5b^2c^2\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= \frac{b^2c^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{d^2x\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2bc^3x(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$
$$+ \frac{5c^2(a+b\arcsin(cx))^2}{6d(d-c^2dx^2)^{3/2}} - \frac{(a+b\arcsin(cx))^2}{2dx^2(d-c^2dx^2)^{3/2}} + \frac{5c^2(a+b\arcsin(cx))^2}{2d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{26ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{5c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{b^2c^2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{5ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{13ib^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{13ib^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{5ibc^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{5b^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{5b^2c^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 9.81 (sec) , antiderivative size = 1090, normalized size of antiderivative = 1.45

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^{5/2}}\,dx = \sqrt{-d(-1+c^2x^2)}\left(-\frac{a^2}{2d^3x^2} + \frac{a^2c^2}{3d^3(-1+c^2x^2)^2}\right.$$
$$\left. - \frac{2a^2c^2}{d^3(-1+c^2x^2)}\right) + \frac{5a^2c^2\log(x)}{2d^{5/2}} - \frac{5a^2c^2\log\left(d+\sqrt{d}\sqrt{-d(-1+c^2x^2)}\right)}{2d^{5/2}}$$
$$+ \frac{abc^2\sqrt{1-c^2x^2}\left(-\frac{2(-1+\arcsin(cx))}{-1+cx} + 52\arcsin(cx) - 6\cot\left(\frac{1}{2}\arcsin(cx)\right) - 3\arcsin(cx)\csc^2\left(\frac{1}{2}\arcsin(cx)\right) + 6\right.}{}$$
$$+ \frac{b^2c^2\sqrt{1-c^2x^2}\left(8 - \frac{2(-2+\arcsin(cx))\arcsin(cx)}{-1+cx} + 52\arcsin(cx)^2 - 12\arcsin(cx)\cot\left(\frac{1}{2}\arcsin(cx)\right) - 3\arcsin(cx)\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^3*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] Sqrt[-(d*(-1 + c^2*x^2))]*(-1/2*a^2/(d^3*x^2) + (a^2*c^2)/(3*d^3*(-1 + c^2*
x^2)^2) - (2*a^2*c^2)/(d^3*(-1 + c^2*x^2))) + (5*a^2*c^2*Log[x])/(2*d^(5/2)
) - (5*a^2*c^2*Log[d + Sqrt[d]*Sqrt[-(d*(-1 + c^2*x^2))]])/(2*d^(5/2)) + (a
*b*c^2*Sqrt[1 - c^2*x^2]*((-2*(-1 + ArcSin[c*x]))/(-1 + c*x) + 52*ArcSin[c*
x] - 6*Cot[ArcSin[c*x]/2] - 3*ArcSin[c*x]*Csc[ArcSin[c*x]/2]^2 + 60*ArcSin[
c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) + 52*Log[Cos
[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - 52*Log[Cos[ArcSin[c*x]/2] + Sin[Arc
Sin[c*x]/2]] + (60*I)*(PolyLog[2, -E^(I*ArcSin[c*x])] - PolyLog[2, E^(I*Arc
Sin[c*x])]) + 3*ArcSin[c*x]*Sec[ArcSin[c*x]/2]^2 + (4*ArcSin[c*x]*Sin[ArcSi
n[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + (52*ArcSin[c*x]*Si
n[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (4*ArcSin[c*x
]*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (2*(1 +
 ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (52*ArcSin[c*x
]*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 6*Tan[Arc
Sin[c*x]/2]))/(12*d^2*Sqrt[d*(1 - c^2*x^2)]) + (b^2*c^2*Sqrt[1 - c^2*x^2]*(
8 - (2*(-2 + ArcSin[c*x])*ArcSin[c*x])/(-1 + c*x) + 52*ArcSin[c*x]^2 - 12*A
rcSin[c*x]*Cot[ArcSin[c*x]/2] - 3*ArcSin[c*x]^2*Csc[ArcSin[c*x]/2]^2 + 24*L
og[Tan[ArcSin[c*x]/2]] - 104*(ArcSin[c*x]*(Log[1 - I*E^(I*ArcSin[c*x])] - L
og[1 + I*E^(I*ArcSin[c*x])]) + I*(PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - Poly
Log[2, I*E^(I*ArcSin[c*x])])) + 60*(ArcSin[c*x]^2*(Log[1 - E^(I*ArcSin[c*x]
)] - Log[1 + E^(I*ArcSin[c*x])]) + (2*I)*ArcSin[c*x]*(PolyLog[2, -E^(I*ArcS
in[c*x])] - PolyLog[2, E^(I*ArcSin[c*x])]) + 2*(-PolyLog[3, -E^(I*ArcSin[c*
x])] + PolyLog[3, E^(I*ArcSin[c*x])])) + 3*ArcSin[c*x]^2*Sec[ArcSin[c*x]/2]
^2 + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[
c*x]/2])^3 + (4*(2 + 13*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]
/2] - Sin[ArcSin[c*x]/2]) - (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSi
n[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[
ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (4*(2 + 13*ArcSin[c*x]^2)*Sin[ArcS
in[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 12*ArcSin[c*x]*Tan[
ArcSin[c*x]/2]))/(24*d^2*Sqrt[d*(1 - c^2*x^2)])
```

Maple [A] (verified)

Time = 0.42 (sec) , antiderivative size = 1121, normalized size of antiderivative = 1.49

method	result	size
default	Expression too large to display	1121
parts	Expression too large to display	1121

```
[In] int((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a^2/d/x^2/(-c^2*d*x^2+d)^(3/2)+5/6*a^2*c^2/d/(-c^2*d*x^2+d)^(3/2)+5/2*
a^2*c^2/d^2/(-c^2*d*x^2+d)^(1/2)-5/2*a^2*c^2/d^(5/2)*ln((2*d+2*d^(1/2)*(-c^
2*d*x^2+d)^(1/2))/x)+b^2*(-1/6*(-d*(c^2*x^2-1))^(1/2)*(15*arcsin(c*x)^2*x^4
*c^4-4*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3*x^3+2*c^4*x^4-20*arcsin(c*x)^2*x^
```

```
2*c^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-2*c^2*x^2+3*arcsin(c*x)^2)/d^3/(
c^4*x^4-2*c^2*x^2+1)/x^2+1/6*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(15*
arcsin(c*x)^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-15*arcsin(c*x)^2*ln(1-I*c*x-(-
c^2*x^2+1)^(1/2))-30*I*arcsin(c*x)*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+30*
I*arcsin(c*x)*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-26*arcsin(c*x)*ln(1+I*(I*
c*x+(-c^2*x^2+1)^(1/2)))+26*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+
26*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))-26*I*dilog(1-I*(I*c*x+(-c^2*x^2+
1)^(1/2)))-6*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-30*polylog(3,I*c*x+(-c^2*x^2+1)
^(1/2))+30*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))+6*ln(1+I*c*x+(-c^2*x^2+1)^(
1/2)))*c^2/d^3/(c^2*x^2-1))-1/3*I*a*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(
1/2)*(-5*I*x^3*c^3+15*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))*c^6*x^6+15*dilog(I*
c*x+(-c^2*x^2+1)^(1/2))*c^6*x^6+26*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*c^6*x^6
+3*I*(-c^2*x^2+1)^(1/2)*arcsin(c*x)+15*I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1
)^(1/2))*x^2*c^2-20*I*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2*c^2-30*dilog(1+I*c
*x+(-c^2*x^2+1)^(1/2))*c^4*x^4-30*dilog(I*c*x+(-c^2*x^2+1)^(1/2))*c^4*x^4-5
2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*c^4*x^4+2*I*x^5*c^5+15*I*arcsin(c*x)*(-c
^2*x^2+1)^(1/2)*x^4*c^4+3*I*c*x+15*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))*c^2*x^
2+15*dilog(I*c*x+(-c^2*x^2+1)^(1/2))*c^2*x^2+26*arctan(I*c*x+(-c^2*x^2+1)^(
1/2))*c^2*x^2-30*I*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))*x^4*c^4+15*I*
arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))*x^6*c^6)/(c^6*x^6-3*c^4*x^4+3*c^
2*x^2-1)/d^3/x^2
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^9 - 3*c^4*d^3*x^7 + 3*c^2*d^3*x^5 - d^3*x^3), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{x^3(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x**3/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**3*(-d*(c*x - 1)*(c*x + 1))**(5/2)), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] -1/6*a^2*(15*c^2*log(2*sqrt(-c^2*d*x^2 + d)*sqrt(d)/abs(x) + 2*d/abs(x))/d^
(5/2) - 15*c^2/(sqrt(-c^2*d*x^2 + d)*d^2) - 5*c^2/((-c^2*d*x^2 + d)^(3/2)*d
) + 3/((-c^2*d*x^2 + d)^(3/2)*d*x^2)) - sqrt(d)*integrate((b^2*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^6*d^3*x^9 - 3*c^4*d^3*x^7 + 3*c^2
*d^3*x^5 - d^3*x^3), x)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^3/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(5/2)*x^3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^3\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{x^3\,\left(d-c^2\,d\,x^2\right)^{5/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^3*(d - c^2*d*x^2)^(5/2)), x)
```

3.263 $\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 538

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^{5/2}}\,dx &= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}}+\frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}}\\
&-\frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{(a+b\arcsin(cx))^2}{3dx^3(d-c^2dx^2)^{3/2}}\\
&-\frac{2c^2(a+b\arcsin(cx))^2}{dx(d-c^2dx^2)^{3/2}}+\frac{8c^4x(a+b\arcsin(cx))^2}{3d(d-c^2dx^2)^{3/2}}\\
&+\frac{16c^4x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{16ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}}\\
&-\frac{32bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}\\
&+\frac{32bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}\\
&-\frac{8ib^2c^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}\\
&-\frac{8ib^2c^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}\end{aligned}$$

```
[Out] -1/3*(a+b*arcsin(c*x))^2/d/x^3/(-c^2*d*x^2+d)^(3/2)-2*c^2*(a+b*arcsin(c*x))
^2/d/x/(-c^2*d*x^2+d)^(3/2)+8/3*c^4*x*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^
(3/2)-1/3*b^2*c^2/d^2/x/(-c^2*d*x^2+d)^(1/2)+2/3*b^2*c^4*x/d^2/(-c^2*d*x^2+
d)^(1/2)+16/3*c^4*x*(a+b*arcsin(c*x))^2/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b*c*(a
+b*arcsin(c*x))/d^2/x^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-16/3*I*c^3*
(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-32/3*b*c^3*
(a+b*arcsin(c*x))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/
```

```
d^2/(-c^2*d*x^2+d)^(1/2)+32/3*b*c^3*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2
+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)^(1/2)-8/3*I*b^2*c^3*pol
ylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d^2/(-c^2*d*x^2+d)
^(1/2)-8/3*I*b^2*c^3*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(
1/2)/d^2/(-c^2*d*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.75 (sec) , antiderivative size = 538, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.517$, Rules used = {4789, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 4793, 4769, 4504, 4268, 277}

$$\int \frac{(a+b\arcsin(cx))^2}{x^4 (d-c^2dx^2)^{5/2}} \, dx = -\frac{32bc^3\sqrt{1-c^2x^2}\text{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{2c^2(a+b\arcsin(cx))^2}{dx\,(d-c^2dx^2)^{3/2}} - \frac{(a+b\arcsin(cx))^2}{3dx^3\,(d-c^2dx^2)^{3/2}} + \frac{16c^4x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d\,(d-c^2dx^2)^{3/2}} - \frac{16ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} + \frac{32bc^3\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} - \frac{8ib^2c^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} - \frac{8ib^2c^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} - \frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] -1/3*(b^2*c^2)/(d^2*x*Sqrt[d - c^2*d*x^2]) + (2*b^2*c^4*x)/(3*d^2*Sqrt[d -
c^2*d*x^2]) - (b*c*(a + b*ArcSin[c*x]))/(3*d^2*x^2*Sqrt[1 - c^2*x^2]*Sqrt[d
 - c^2*d*x^2]) - (a + b*ArcSin[c*x])^2/(3*d*x^3*(d - c^2*d*x^2)^(3/2)) - (2
*c^2*(a + b*ArcSin[c*x])^2)/(d*x*(d - c^2*d*x^2)^(3/2)) + (8*c^4*x*(a + b*A
rcSin[c*x])^2)/(3*d*(d - c^2*d*x^2)^(3/2)) + (16*c^4*x*(a + b*ArcSin[c*x])^
2)/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((16*I)/3)*c^3*Sqrt[1 - c^2*x^2]*(a + b*A
rcSin[c*x])^2)/(d^2*Sqrt[d - c^2*d*x^2]) - (32*b*c^3*Sqrt[1 - c^2*x^2]*(a +
 b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*x])])/(3*d^2*Sqrt[d - c^2*d*x^2])
 + (32*b*c^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[
c*x])])/(3*d^2*Sqrt[d - c^2*d*x^2]) - (((8*I)/3)*b^2*c^3*Sqrt[1 - c^2*x^2]*
```

```
PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(d^2*Sqrt[d - c^2*d*x^2]) - (((8*I)/3)*
b^2*c^3*Sqrt[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(d^2*Sqrt[d -
c^2*d*x^2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 277

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Dist[b*((m + n*(p + 1) + 1)/(a*(m + 1
))), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
```

(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ[m, 0]

Rule 4504

Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n, x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]

Rule 4745

Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x])^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0]

Rule 4747

Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && NeQ[p, -3/2]

Rule 4765

Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2), x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]

Rule 4767

Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]

Rule 4769

Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)), x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{(a+b\arcsin(cx))^2}{3dx^3\left(d-c^2dx^2\right)^{3/2}} \\
&\quad+\left(2c^2\right)\int\frac{(a+b\arcsin(cx))^2}{x^2\left(d-c^2dx^2\right)^{5/2}}\,dx+\frac{\left(2bc\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{x^3\left(1-c^2x^2\right)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}} \\
&= -\frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{(a+b\arcsin(cx))^2}{3dx^3\left(d-c^2dx^2\right)^{3/2}}-\frac{2c^2(a+b\arcsin(cx))^2}{dx\left(d-c^2dx^2\right)^{3/2}} \\
&\quad+\left(8c^4\right)\int\frac{(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx+\frac{\left(b^2c^2\sqrt{1-c^2x^2}\right)\int\frac{1}{x^2\left(1-c^2x^2\right)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad+\frac{\left(4bc^3\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{x\left(1-c^2x^2\right)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}+\frac{\left(4bc^3\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{x\left(1-c^2x^2\right)^2}\,dx}{d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{8bc^3(a+b\arcsin(cx))}{3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{3dx^3(d-c^2dx^2)^{3/2}} - \frac{2c^2(a+b\arcsin(cx))^2}{dx(d-c^2dx^2)^{3/2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{(16c^4)\int\frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx}{3d} + \frac{\left(4bc^3\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{x(1-c^2x^2)}\,dx}{3d^2\sqrt{d-c^2dx^2}} + \frac{\left(4bc^3\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{x(1-c^2x^2)}\,dx}{d^2\sqrt{d-c^2dx^2}} - \frac{\left(2b^2c^4\sqrt{1-c^2x^2}\right)\int\frac{1}{(1-c^2x^2)^{3/2}}\,dx}{d^2\sqrt{d-c^2dx^2}} - \frac{\left(16bc^5\sqrt{1-c^2x^2}\right)\int\frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} - \frac{2b^2c^4x}{d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{3dx^3(d-c^2dx^2)^{3/2}} - \frac{2c^2(a+b\arcsin(cx))^2}{dx(d-c^2dx^2)^{3/2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{16c^4x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} + \frac{\left(4bc^3\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int(a+bx)\csc(x)\sec(x)\,dx,x,\arcsin(cx)\right)}{3d^2\sqrt{d-c^2dx^2}} + \frac{\left(4bc^3\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int(a+bx)\csc(x)\sec(x)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} + \frac{\left(8b^2c^4\sqrt{1-c^2x^2}\right)\int\frac{1}{(1-c^2x^2)^{3/2}}\,dx}{3d^2\sqrt{d-c^2dx^2}} - \frac{\left(32bc^5\sqrt{1-c^2x^2}\right)\int\frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{3dx^3(d-c^2dx^2)^{3/2}} - \frac{2c^2(a+b\arcsin(cx))^2}{dx(d-c^2dx^2)^{3/2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{16c^4x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} + \frac{\left(8bc^3\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int(a+bx)\csc(2x)\,dx,x,\arcsin(cx)\right)}{3d^2\sqrt{d-c^2dx^2}} + \frac{\left(8bc^3\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int(a+bx)\csc(2x)\,dx,x,\arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} - \frac{\left(32bc^3\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{3d^2\sqrt{d-c^2dx^2}}$$

$$
\begin{aligned}
&= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&\quad - \frac{(a+b\arcsin(cx))^2}{3dx^3(d-c^2dx^2)^{3/2}} - \frac{2c^2(a+b\arcsin(cx))^2}{dx(d-c^2dx^2)^{3/2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d(d-c^2dx^2)^{3/2}} \\
&\quad + \frac{16c^4x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{16ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{32bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(64ibc^3\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(4b^2c^3\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(4b^2c^3\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{3d^2\sqrt{d-c^2dx^2}} \\
&\quad - \frac{\left(4b^2c^3\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(4b^2c^3\sqrt{1-c^2x^2}\right)\operatorname{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{3dx^3(d-c^2dx^2)^{3/2}} - \frac{2c^2(a+b\arcsin(cx))^2}{dx(d-c^2dx^2)^{3/2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{16c^4x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{16ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{32bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} + \frac{32bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} + \frac{\left(2ib^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}dx,x,e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} - \frac{\left(2ib^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}dx,x,e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} + \frac{\left(2ib^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}dx,x,e^{2i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} - \frac{\left(2ib^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}dx,x,e^{2i\arcsin(cx)}\right)}{d^2\sqrt{d-c^2dx^2}} - \frac{\left(32b^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)dx,x,\arcsin(cx)\right)}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{(a+b\arcsin(cx))^2}{3dx^3(d-c^2dx^2)^{3/2}} - \frac{2c^2(a+b\arcsin(cx))^2}{dx(d-c^2dx^2)^{3/2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d(d-c^2dx^2)^{3/2}} + \frac{16c^4x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{16ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{32bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} + \frac{32bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} + \frac{8ib^2c^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} - \frac{8ib^2c^3\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}} + \frac{\left(16ib^2c^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}dx,x,e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$

$$= -\frac{b^2c^2}{3d^2x\sqrt{d-c^2dx^2}} + \frac{2b^2c^4x}{3d^2\sqrt{d-c^2dx^2}} - \frac{bc(a+b\arcsin(cx))}{3d^2x^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}$$
$$- \frac{(a+b\arcsin(cx))^2}{3dx^3\left(d-c^2dx^2\right)^{3/2}} - \frac{2c^2(a+b\arcsin(cx))^2}{dx\left(d-c^2dx^2\right)^{3/2}} + \frac{8c^4x(a+b\arcsin(cx))^2}{3d\left(d-c^2dx^2\right)^{3/2}}$$
$$+ \frac{16c^4x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{16ic^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{32bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$
$$+ \frac{32bc^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{8ib^2c^3\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$
$$- \frac{8ib^2c^3\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{3d^2\sqrt{d-c^2dx^2}}$$

Mathematica [A] (verified)

Time = 3.37 (sec) , antiderivative size = 441, normalized size of antiderivative = 0.82

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^{5/2}}\,dx = \frac{-\frac{a^2\left(1+6c^2x^2-24c^4x^4+16c^6x^6\right)}{x^3} - \frac{ab\left(2\left(1+6c^2x^2-24c^4x^4+16c^6x^6\right)\arcsin(cx)+cx\sqrt{1-c^2x^2}\left(1+16c^2x^2(-1\right.\right.}{x^3}}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^4*(d - c^2*d*x^2)^(5/2)),x]
```

```
[Out] (-((a^2*(1 + 6*c^2*x^2 - 24*c^4*x^4 + 16*c^6*x^6))/x^3) - (a*b*(2*(1 + 6*c^
2*x^2 - 24*c^4*x^4 + 16*c^6*x^6)*ArcSin[c*x] + c*x*Sqrt[1 - c^2*x^2]*(1 + 1
6*c^2*x^2*(-1 + c^2*x^2)*Log[c*x] + 8*c^2*x^2*(-1 + c^2*x^2)*Log[1 - c^2*x^
2])))/x^3 + b^2*c^3*(1 - c^2*x^2)^(3/2)*((c*x)/Sqrt[1 - c^2*x^2] - Sqrt[1 -
 c^2*x^2]/(c*x) - ArcSin[c*x]/(c^2*x^2) + ArcSin[c*x]/(-1 + c^2*x^2) - (16*
I)*ArcSin[c*x]^2 + (c*x*ArcSin[c*x]^2)/(1 - c^2*x^2)^(3/2) + (8*c*x*ArcSin[
c*x]^2)/Sqrt[1 - c^2*x^2] - (Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(c^3*x^3) - (
8*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(c*x) + 16*ArcSin[c*x]*Log[1 - E^((2*I)*
ArcSin[c*x])] + 16*ArcSin[c*x]*Log[1 + E^((2*I)*ArcSin[c*x])] - (8*I)*PolyL
og[2, -E^((2*I)*ArcSin[c*x])] - (8*I)*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(
3*d*(d - c^2*d*x^2)^(3/2))
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 5224 vs. $2(517) = 1034$.

Time = 0.34 (sec) , antiderivative size = 5225, normalized size of antiderivative = 9.71

method	result	size
default	Expression too large to display	5225
parts	Expression too large to display	5225

```
[In] int((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE)
[Out] result too large to display
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^6*d^3*x^10 - 3*c^4*d^3*x^8 + 3*c^2*d^3*x^6 - d^3*x^4), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(a+b\operatorname{asin}(cx))^2}{x^4(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x**4/(-c**2*d*x**2+d)**(5/2),x)
[Out] Integral((a + b*asin(c*x))**2/(x**4*(-d*(c*x - 1)*(c*x + 1))**(5/2)), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
[Out] 1/3*a*b*c*(8*c^2*log(c*x + 1)/d^(5/2) + 8*c^2*log(c*x - 1)/d^(5/2) + 16*c^2
*log(x)/d^(5/2) + 1/(c^2*d^(5/2)*x^4 - d^(5/2)*x^2)) + 2/3*(16*c^4*x/(sqrt(
-c^2*d*x^2 + d)*d^2) + 8*c^4*x/((-c^2*d*x^2 + d)^(3/2)*d) - 6*c^2/((-c^2*d*
x^2 + d)^(3/2)*d*x) - 1/((-c^2*d*x^2 + d)^(3/2)*d*x^3))*a*b*arcsin(c*x) + 1
/3*(16*c^4*x/(sqrt(-c^2*d*x^2 + d)*d^2) + 8*c^4*x/((-c^2*d*x^2 + d)^(3/2)*d
) - 6*c^2/((-c^2*d*x^2 + d)^(3/2)*d*x) - 1/((-c^2*d*x^2 + d)^(3/2)*d*x^3))*
a^2 + b^2*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^4*d^2*
x^8 - 2*c^2*d^2*x^6 + d^2*x^4)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^4/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(5/2)*x^4), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^4\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{x^4\,\left(d-c^2\,d\,x^2\right)^{5/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^(5/2)),x)
[Out] int((a + b*asin(c*x))^2/(x^4*(d - c^2*d*x^2)^(5/2)), x)
```

3.264 $\int \frac{x^4 \arcsin(ax)^2}{\sqrt{1-a^2x^2}} dx$

Optimal result

Integrand size = 24, antiderivative size = 157

$$\int \frac{x^4 \arcsin(ax)^2}{\sqrt{1-a^2x^2}} dx = \frac{15x\sqrt{1-a^2x^2}}{64a^4} + \frac{x^3\sqrt{1-a^2x^2}}{32a^2} - \frac{15\arcsin(ax)}{64a^5} + \frac{3x^2\arcsin(ax)}{8a^3} + \frac{x^4\arcsin(ax)}{8a} - \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)^2}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)^2}{4a^2} + \frac{\arcsin(ax)^3}{8a^5}$$

```
[Out] -15/64*arcsin(a*x)/a^5+3/8*x^2*arcsin(a*x)/a^3+1/8*x^4*arcsin(a*x)/a+1/8*ar
csin(a*x)^3/a^5+15/64*x*(-a^2*x^2+1)^(1/2)/a^4+1/32*x^3*(-a^2*x^2+1)^(1/2)/
a^2-3/8*x*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a^4-1/4*x^3*arcsin(a*x)^2*(-a^2*
x^2+1)^(1/2)/a^2
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4795, 4737, 4723, 327, 222}

$$\int \frac{x^4 \arcsin(ax)^2}{\sqrt{1-a^2x^2}} dx = \frac{\arcsin(ax)^3}{8a^5} - \frac{15\arcsin(ax)}{64a^5} + \frac{3x^2\arcsin(ax)}{8a^3} - \frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)^2}{4a^2} + \frac{x^3\sqrt{1-a^2x^2}}{32a^2} - \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)^2}{8a^4} + \frac{15x\sqrt{1-a^2x^2}}{64a^4} + \frac{x^4\arcsin(ax)}{8a}$$

```
[In] Int[(x^4*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (15*x*Sqrt[1 - a^2*x^2])/(64*a^4) + (x^3*Sqrt[1 - a^2*x^2])/(32*a^2) - (15*
ArcSin[a*x])/(64*a^5) + (3*x^2*ArcSin[a*x])/(8*a^3) + (x^4*ArcSin[a*x])/(8*
a) - (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(8*a^4) - (x^3*Sqrt[1 - a^2*x^2]
*ArcSin[a*x]^2)/(4*a^2) + ArcSin[a*x]^3/(8*a^5)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = -\frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)^2}{4a^2} + \frac{3\int \frac{x^2\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx}{4a^2} + \frac{\int x^3\arcsin(ax)\,dx}{2a}$$

$$= \frac{x^4 \arcsin(ax)}{8a} - \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)^2}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)^2}{4a^2} - \frac{1}{8}\int \frac{x^4}{\sqrt{1-a^2x^2}}\,dx + \frac{3\int \frac{\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx}{8a^4} + \frac{3\int x\arcsin(ax)\,dx}{4a^3}$$

$$= \frac{x^3\sqrt{1-a^2x^2}}{32a^2} + \frac{3x^2\arcsin(ax)}{8a^3} + \frac{x^4\arcsin(ax)}{8a} - \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)^2}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)^2}{4a^2} + \frac{\arcsin(ax)^3}{8a^5} - \frac{3\int \frac{x^2}{\sqrt{1-a^2x^2}}\,dx}{32a^2} - \frac{3\int \frac{x^2}{\sqrt{1-a^2x^2}}\,dx}{8a^2}$$

$$= \frac{15x\sqrt{1-a^2x^2}}{64a^4} + \frac{x^3\sqrt{1-a^2x^2}}{32a^2} + \frac{3x^2\arcsin(ax)}{8a^3} + \frac{x^4\arcsin(ax)}{8a} - \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)^2}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)^2}{4a^2} + \frac{\arcsin(ax)^3}{8a^5} - \frac{3\int \frac{1}{\sqrt{1-a^2x^2}}\,dx}{64a^4} - \frac{3\int \frac{1}{\sqrt{1-a^2x^2}}\,dx}{16a^4}$$

$$= \frac{15x\sqrt{1-a^2x^2}}{64a^4} + \frac{x^3\sqrt{1-a^2x^2}}{32a^2} - \frac{15\arcsin(ax)}{64a^5} + \frac{3x^2\arcsin(ax)}{8a^3} + \frac{x^4\arcsin(ax)}{8a} - \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)^2}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)^2}{4a^2} + \frac{\arcsin(ax)^3}{8a^5}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.64

$$\int \frac{x^4\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{ax\sqrt{1-a^2x^2}(15+2a^2x^2) + (-15+24a^2x^2+8a^4x^4)\arcsin(ax) - 8ax\sqrt{1-a^2x^2}(3+2a^2x^2)\arcsin(ax)^2}{64a^5}$$

```
[In] Integrate[(x^4*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (a*x*Sqrt[1 - a^2*x^2]*(15 + 2*a^2*x^2) + (-15 + 24*a^2*x^2 + 8*a^4*x^4)*Ar
cSin[a*x] - 8*a*x*Sqrt[1 - a^2*x^2]*(3 + 2*a^2*x^2)*ArcSin[a*x]^2 + 8*ArcSi
n[a*x]^3)/(64*a^5)
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.82

method	result
default	$\frac{-16\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^3x^3+8a^4x^4\arcsin(ax)+2a^3x^3\sqrt{-a^2x^2+1}-24\arcsin(ax)^2\sqrt{-a^2x^2+1}\,ax+24a^2x^2\arcsin(ax)+8\arcsin(a}{64a^5}$

```
[In] int(x^4*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/64*(-16*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^3*x^3+8*a^4*x^4*arcsin(a*x)+2*
a^3*x^3*(-a^2*x^2+1)^(1/2)-24*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a*x+24*a^2*x
^2*arcsin(a*x)+8*arcsin(a*x)^3+15*a*x*(-a^2*x^2+1)^(1/2)-15*arcsin(a*x))/a^
5
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.54

$$\int \frac{x^4 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx$$
$$= \frac{8\arcsin(ax)^3 + (8a^4x^4 + 24a^2x^2 - 15)\arcsin(ax) + \left(2a^3x^3 - 8(2a^3x^3 + 3ax)\arcsin(ax)^2 + 15ax\right)\sqrt{-}}{64a^5}$$

```
[In] integrate(x^4*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/64*(8*arcsin(a*x)^3 + (8*a^4*x^4 + 24*a^2*x^2 - 15)*arcsin(a*x) + (2*a^3*
x^3 - 8*(2*a^3*x^3 + 3*a*x)*arcsin(a*x)^2 + 15*a*x)*sqrt(-a^2*x^2 + 1))/a^5
```

Sympy [A] (verification not implemented)

Time = 0.51 (sec) , antiderivative size = 146, normalized size of antiderivative = 0.93

$$\int \frac{x^4 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx$$
$$= \begin{cases} \frac{x^4\operatorname{asin}(ax)}{8a} - \frac{x^3\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{4a^2} + \frac{x^3\sqrt{-a^2x^2+1}}{32a^2} + \frac{3x^2\operatorname{asin}(ax)}{8a^3} - \frac{3x\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{8a^4} + \frac{15x\sqrt{-a^2x^2+1}}{64a^4} + \frac{\operatorname{asin}^3(ax)}{8a^5} - \\ 0 \end{cases}$$

```
[In] integrate(x**4*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x**4*asin(a*x)/(8*a) - x**3*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(4
*a**2) + x**3*sqrt(-a**2*x**2 + 1)/(32*a**2) + 3*x**2*asin(a*x)/(8*a**3) -
3*x*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(8*a**4) + 15*x*sqrt(-a**2*x**2 + 1)/
(64*a**4) + asin(a*x)**3/(8*a**5) - 15*asin(a*x)/(64*a**5), Ne(a, 0)), (0,
True))
```

Maxima [F]

$$\int \frac{x^4 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^4 \arcsin{(ax)}^2}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^4*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^4*arcsin(a*x)^2/sqrt(-a^2*x^2 + 1), x)
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 143, normalized size of antiderivative = 0.91

$$\begin{aligned}\int \frac{x^4 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx &= \frac{(-a^2x^2+1)^{\frac{3}{2}} x \arcsin{(ax)}^2}{4\,a^4} - \frac{5\,\sqrt{-a^2x^2+1}x \arcsin{(ax)}^2}{8\,a^4} \\ &\quad - \frac{(-a^2x^2+1)^{\frac{3}{2}} x}{32\,a^4} + \frac{(a^2x^2-1)^2 \arcsin{(ax)}}{8\,a^5} + \frac{\arcsin{(ax)}^3}{8\,a^5} \\ &\quad + \frac{17\,\sqrt{-a^2x^2+1}x}{64\,a^4} + \frac{5\,(a^2x^2-1)\arcsin{(ax)}}{8\,a^5} + \frac{17\,\arcsin{(ax)}}{64\,a^5}\end{aligned}$$

```
[In] integrate(x^4*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] 1/4*(-a^2*x^2 + 1)^(3/2)*x*arcsin(a*x)^2/a^4 - 5/8*sqrt(-a^2*x^2 + 1)*x*arc
sin(a*x)^2/a^4 - 1/32*(-a^2*x^2 + 1)^(3/2)*x/a^4 + 1/8*(a^2*x^2 - 1)^2*arcs
in(a*x)/a^5 + 1/8*arcsin(a*x)^3/a^5 + 17/64*sqrt(-a^2*x^2 + 1)*x/a^4 + 5/8*
(a^2*x^2 - 1)*arcsin(a*x)/a^5 + 17/64*arcsin(a*x)/a^5
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^4\,\mathrm{asin}(a\,x)^2}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^4*asin(a*x)^2)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^4*asin(a*x)^2)/(1 - a^2*x^2)^(1/2), x)
```

3.265 $\int \frac{x^3 \arcsin(ax)^2}{\sqrt{1-a^2x^2}} \, dx$

Optimal result

Integrand size = 24, antiderivative size = 126

$$\int \frac{x^3 \arcsin(ax)^2}{\sqrt{1-a^2x^2}} \, dx = \frac{14\sqrt{1-a^2x^2}}{9a^4} - \frac{2(1-a^2x^2)^{3/2}}{27a^4} + \frac{4x \arcsin(ax)}{3a^3} + \frac{2x^3 \arcsin(ax)}{9a} - \frac{2\sqrt{1-a^2x^2} \arcsin(ax)^2}{3a^4} - \frac{x^2\sqrt{1-a^2x^2} \arcsin(ax)^2}{3a^2}$$

```
[Out] -2/27*(-a^2*x^2+1)^(3/2)/a^4+4/3*x*arcsin(a*x)/a^3+2/9*x^3*arcsin(a*x)/a+14
/9*(-a^2*x^2+1)^(1/2)/a^4-2/3*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a^4-1/3*x^2*
arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a^2
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4795, 4767, 4715, 267, 4723, 272, 45}

$$\int \frac{x^3 \arcsin(ax)^2}{\sqrt{1-a^2x^2}} \, dx = \frac{4x \arcsin(ax)}{3a^3} - \frac{x^2\sqrt{1-a^2x^2} \arcsin(ax)^2}{3a^2} - \frac{2\sqrt{1-a^2x^2} \arcsin(ax)^2}{3a^4} - \frac{2(1-a^2x^2)^{3/2}}{27a^4} + \frac{14\sqrt{1-a^2x^2}}{9a^4} + \frac{2x^3 \arcsin(ax)}{9a}$$

```
[In] Int[(x^3*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (14*Sqrt[1 - a^2*x^2])/(9*a^4) - (2*(1 - a^2*x^2)^(3/2))/(27*a^4) + (4*x*Ar
cSin[a*x])/(3*a^3) + (2*x^3*ArcSin[a*x])/(9*a) - (2*Sqrt[1 - a^2*x^2]*ArcSi
n[a*x]^2)/(3*a^4) - (x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(3*a^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
```

```
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)^2}{3a^2}+\frac{2\int \frac{x\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx}{3a^2}+\frac{2\int x^2\arcsin(ax)\,dx}{3a} \\
&= \frac{2x^3\arcsin(ax)}{9a}-\frac{2\sqrt{1-a^2x^2}\arcsin(ax)^2}{3a^4}-\frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)^2}{3a^2} \\
&\quad -\frac{2}{9}\int \frac{x^3}{\sqrt{1-a^2x^2}}\,dx+\frac{4\int \arcsin(ax)\,dx}{3a^3} \\
&= \frac{4x\arcsin(ax)}{3a^3}+\frac{2x^3\arcsin(ax)}{9a}-\frac{2\sqrt{1-a^2x^2}\arcsin(ax)^2}{3a^4} \\
&\quad -\frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)^2}{3a^2}-\frac{1}{9}\text{Subst}\left(\int \frac{x}{\sqrt{1-a^2x}}\,dx,x,x^2\right)-\frac{4\int \frac{x}{\sqrt{1-a^2x^2}}\,dx}{3a^2} \\
&= \frac{4\sqrt{1-a^2x^2}}{3a^4}+\frac{4x\arcsin(ax)}{3a^3}+\frac{2x^3\arcsin(ax)}{9a}-\frac{2\sqrt{1-a^2x^2}\arcsin(ax)^2}{3a^4} \\
&\quad -\frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)^2}{3a^2}-\frac{1}{9}\text{Subst}\left(\int \left(\frac{1}{a^2\sqrt{1-a^2x}}-\frac{\sqrt{1-a^2x}}{a^2}\right)\,dx,x,x^2\right) \\
&= \frac{14\sqrt{1-a^2x^2}}{9a^4}-\frac{2(1-a^2x^2)^{3/2}}{27a^4}+\frac{4x\arcsin(ax)}{3a^3}+\frac{2x^3\arcsin(ax)}{9a} \\
&\quad -\frac{2\sqrt{1-a^2x^2}\arcsin(ax)^2}{3a^4}-\frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)^2}{3a^2}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.64

$$\int \frac{x^3\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{2\sqrt{1-a^2x^2}(20+a^2x^2)+6ax(6+a^2x^2)\arcsin(ax)-9\sqrt{1-a^2x^2}(2+a^2x^2)\arcsin(ax)^2}{27a^4}$$

```
[In] Integrate[(x^3*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
[Out] (2*Sqrt[1 - a^2*x^2]*(20 + a^2*x^2) + 6*a*x*(6 + a^2*x^2)*ArcSin[a*x] - 9*S
qrt[1 - a^2*x^2]*(2 + a^2*x^2)*ArcSin[a*x]^2)/(27*a^4)
```

Maple [A] (verified)

Time = 0.15 (sec) , antiderivative size = 127, normalized size of antiderivative = 1.01

method	result
default	$-\frac{\left(9a^4x^4\arcsin(ax)^2+9\arcsin(ax)^2a^2x^2+6\arcsin(ax)\sqrt{-a^2x^2+1}\,a^3x^3-2a^4x^4-38a^2x^2-18\arcsin(ax)^2+36\arcsin(ax)\sqrt{-a^2x^2+}\right.}{27a^4(a^2x^2-1)}$

```
[In] int(x^3*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/27/a^4*(9*a^4*x^4*arcsin(a*x)^2+9*arcsin(a*x)^2*a^2*x^2+6*arcsin(a*x)*(-
a^2*x^2+1)^(1/2)*a^3*x^3-2*a^4*x^4-38*a^2*x^2-18*arcsin(a*x)^2+36*arcsin(a*
x)*(-a^2*x^2+1)^(1/2)*a*x+40)*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.51

$$\int \frac{x^3\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{6\,(a^3x^3+6\,ax)\arcsin{(ax)}+\left(2\,a^2x^2-9\,(a^2x^2+2)\arcsin{(ax)}^2+40\right)\sqrt{-a^2x^2+1}}{27\,a^4}$$

```
[In] integrate(x^3*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/27*(6*(a^3*x^3 + 6*a*x)*arcsin(a*x) + (2*a^2*x^2 - 9*(a^2*x^2 + 2)*arcsin
(a*x)^2 + 40)*sqrt(-a^2*x^2 + 1))/a^4
```

Sympy [A] (verification not implemented)

Time = 0.40 (sec) , antiderivative size = 121, normalized size of antiderivative = 0.96

$$\int \frac{x^3\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{2x^3\operatorname{asin}{(ax)}}{9a}-\frac{x^2\sqrt{-a^2x^2+1}\operatorname{asin}^2{(ax)}}{3a^2}+\frac{2x^2\sqrt{-a^2x^2+1}}{27a^2}+\frac{4x\operatorname{asin}{(ax)}}{3a^3}-\frac{2\sqrt{-a^2x^2+1}\operatorname{asin}^2{(ax)}}{3a^4}+\frac{40\sqrt{-a^2x^2+1}}{27a^4} & \text{for}\ a\neq 0 \\ 0 & \text{otherwise} \end{cases}$$

```
[In] integrate(x**3*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((2*x**3*asin(a*x)/(9*a) - x**2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/
(3*a**2) + 2*x**2*sqrt(-a**2*x**2 + 1)/(27*a**2) + 4*x*asin(a*x)/(3*a**3) -
 2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(3*a**4) + 40*sqrt(-a**2*x**2 + 1)/(27
*a**4), Ne(a, 0)), (0, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 105, normalized size of antiderivative = 0.83

$$\int \frac{x^3 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = -\frac{1}{3}\left(\frac{\sqrt{-a^2x^2+1}x^2}{a^2}+\frac{2\sqrt{-a^2x^2+1}}{a^4}\right)\arcsin(ax)^2 + \frac{2\left(\sqrt{-a^2x^2+1}x^2+\frac{20\sqrt{-a^2x^2+1}}{a^2}\right)}{27\,a^2} + \frac{2\,(a^2x^3+6\,x)\arcsin(ax)}{9\,a^3}$$

```
[In] integrate(x^3*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/3*(sqrt(-a^2*x^2 + 1)*x^2/a^2 + 2*sqrt(-a^2*x^2 + 1)/a^4)*arcsin(a*x)^2
+ 2/27*(sqrt(-a^2*x^2 + 1)*x^2 + 20*sqrt(-a^2*x^2 + 1)/a^2)/a^2 + 2/9*(a^2*
x^3 + 6*x)*arcsin(a*x)/a^3
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^3 \operatorname{asin}(a\,x)^2}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^3*asin(a*x)^2)/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] int((x^3*asin(a*x)^2)/(1 - a^2*x^2)^(1/2), x)
```

3.266 $\int \frac{x^2 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\, dx$

Optimal result

Integrand size = 24, antiderivative size = 89

$$\int \frac{x^2 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\, dx = \frac{x\sqrt{1-a^2x^2}}{4a^2} - \frac{\arcsin(ax)}{4a^3} + \frac{x^2\arcsin(ax)}{2a} - \frac{x\sqrt{1-a^2x^2}\arcsin(ax)^2}{2a^2} + \frac{\arcsin(ax)^3}{6a^3}$$

```
[Out] -1/4*arcsin(a*x)/a^3+1/2*x^2*arcsin(a*x)/a+1/6*arcsin(a*x)^3/a^3+1/4*x*(-a^
2*x^2+1)^(1/2)/a^2-1/2*x*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a^2
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4795, 4737, 4723, 327, 222}

$$\int \frac{x^2 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\, dx = \frac{\arcsin(ax)^3}{6a^3} - \frac{\arcsin(ax)}{4a^3} - \frac{x\sqrt{1-a^2x^2}\arcsin(ax)^2}{2a^2} + \frac{x\sqrt{1-a^2x^2}}{4a^2} + \frac{x^2\arcsin(ax)}{2a}$$

```
[In] Int[(x^2*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (x*Sqrt[1 - a^2*x^2])/(4*a^2) - ArcSin[a*x]/(4*a^3) + (x^2*ArcSin[a*x])/(2*
a) - (x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(2*a^2) + ArcSin[a*x]^3/(6*a^3)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x\sqrt{1-a^2x^2}\arcsin(ax)^2}{2a^2}+\frac{\int\frac{\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx}{2a^2}+\frac{\int x\arcsin(ax)\,dx}{a}\\
&= \frac{x^2\arcsin(ax)}{2a}-\frac{x\sqrt{1-a^2x^2}\arcsin(ax)^2}{2a^2}+\frac{\arcsin(ax)^3}{6a^3}-\frac{1}{2}\int\frac{x^2}{\sqrt{1-a^2x^2}}\,dx\\
&= \frac{x\sqrt{1-a^2x^2}}{4a^2}+\frac{x^2\arcsin(ax)}{2a}-\frac{x\sqrt{1-a^2x^2}\arcsin(ax)^2}{2a^2}+\frac{\arcsin(ax)^3}{6a^3}-\frac{\int\frac{1}{\sqrt{1-a^2x^2}}\,dx}{4a^2}\\
&= \frac{x\sqrt{1-a^2x^2}}{4a^2}-\frac{\arcsin(ax)}{4a^3}+\frac{x^2\arcsin(ax)}{2a}-\frac{x\sqrt{1-a^2x^2}\arcsin(ax)^2}{2a^2}+\frac{\arcsin(ax)^3}{6a^3}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.82

$$\int \frac{x^2 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{3ax\sqrt{1-a^2x^2}+(-3+6a^2x^2)\arcsin(ax)-6ax\sqrt{1-a^2x^2}\arcsin(ax)^2+2\arcsin(ax)^3}{12a^3}$$

```
[In] Integrate[(x^2*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
[Out] (3*a*x*Sqrt[1 - a^2*x^2] + (-3 + 6*a^2*x^2)*ArcSin[a*x] - 6*a*x*Sqrt[1 - a^
2*x^2]*ArcSin[a*x]^2 + 2*ArcSin[a*x]^3)/(12*a^3)
```

Maple [A] (verified)

Time = 0.17 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.80

method	result	size
default	$\frac{-6\arcsin(ax)^2\sqrt{-a^2x^2+1}\,ax+6a^2x^2\arcsin(ax)+2\arcsin(ax)^3+3ax\sqrt{-a^2x^2+1}-3\arcsin(ax)}{12a^3}$	71

```
[In] int(x^2*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/12*(-6*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a*x+6*a^2*x^2*arcsin(a*x)+2*arcsi
n(a*x)^3+3*a*x*(-a^2*x^2+1)^(1/2)-3*arcsin(a*x))/a^3
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.66

$$\int \frac{x^2 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{2\arcsin(ax)^3+3\,(2\,a^2x^2-1)\arcsin(ax)-3\,\sqrt{-a^2x^2+1}\left(2\,ax\arcsin(ax)^2-ax\right)}{12\,a^3}$$

```
[In] integrate(x^2*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] 1/12*(2*arcsin(a*x)^3 + 3*(2*a^2*x^2 - 1)*arcsin(a*x) - 3*sqrt(-a^2*x^2 + 1
)*(2*a*x*arcsin(a*x)^2 - a*x))/a^3
```

Sympy [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.88

$$\int \frac{x^2 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{x^2 \operatorname{asin}(ax)}{2a} - \frac{x\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{2a^2} + \frac{x\sqrt{-a^2x^2+1}}{4a^2} + \frac{\operatorname{asin}^3(ax)}{6a^3} - \frac{\operatorname{asin}(ax)}{4a^3} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

```
[In] integrate(x**2*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
[Out] Piecewise((x**2*asin(a*x)/(2*a) - x*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(2*a*
*2) + x*sqrt(-a**2*x**2 + 1)/(4*a**2) + asin(a*x)**3/(6*a**3) - asin(a*x)/(
4*a**3), Ne(a, 0)), (0, True))
```

Maxima [F]

$$\int \frac{x^2 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^2 \arcsin(ax)^2}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^2*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^2*arcsin(a*x)^2/sqrt(-a^2*x^2 + 1), x)
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.91

$$\int \frac{x^2 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{-a^2x^2+1}x\arcsin(ax)^2}{2a^2} + \frac{\arcsin(ax)^3}{6a^3} + \frac{\sqrt{-a^2x^2+1}x}{4a^2} + \frac{(a^2x^2-1)\arcsin(ax)}{2a^3} + \frac{\arcsin(ax)}{4a^3}$$

```
[In] integrate(x^2*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] -1/2*sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)^2/a^2 + 1/6*arcsin(a*x)^3/a^3 + 1/4*s
qrt(-a^2*x^2 + 1)*x/a^2 + 1/2*(a^2*x^2 - 1)*arcsin(a*x)/a^3 + 1/4*arcsin(a*
x)/a^3
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2 \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^2\,\mathrm{asin}(a\,x)^2}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^2*asin(a*x)^2)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^2*asin(a*x)^2)/(1 - a^2*x^2)^(1/2), x)
```

3.267 $\int \frac{x \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 55

$$\int \frac{x \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{2\sqrt{1-a^2x^2}}{a^2} + \frac{2x\arcsin(ax)}{a} - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{a^2}$$

```
[Out] 2*x*arcsin(a*x)/a+2*(-a^2*x^2+1)^(1/2)/a^2-arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)
/a^2
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = {4767, 4715, 267}

$$\int \frac{x \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{a^2} + \frac{2\sqrt{1-a^2x^2}}{a^2} + \frac{2x\arcsin(ax)}{a}$$

```
[In] Int[(x*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2])/a^2 + (2*x*ArcSin[a*x])/a - (Sqrt[1 - a^2*x^2]*ArcSin
[a*x]^2)/a^2
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{a^2}+\frac{2\int\arcsin(ax)\,dx}{a}\\ &= \frac{2x\arcsin(ax)}{a}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{a^2}-2\int\frac{x}{\sqrt{1-a^2x^2}}\,dx\\ &= \frac{2\sqrt{1-a^2x^2}}{a^2}+\frac{2x\arcsin(ax)}{a}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{a^2}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.93

$$\int\frac{x\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx=\frac{2\sqrt{1-a^2x^2}+2ax\arcsin(ax)-\sqrt{1-a^2x^2}\arcsin(ax)^2}{a^2}$$

```
[In] Integrate[(x*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
[Out] (2*Sqrt[1 - a^2*x^2] + 2*a*x*ArcSin[a*x] - Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)
/a^2
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.45

method	result	size
default	$-\frac{\sqrt{-a^2x^2+1}\left(\arcsin(ax)^2a^2x^2-\arcsin(ax)^2+2\arcsin(ax)\sqrt{-a^2x^2+1}\,ax-2a^2x^2+2\right)}{a^2(a^2x^2-1)}$	80

```
[In] int(x*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/a^2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)*(arcsin(a*x)^2*a^2*x^2-arcsin(a*x)^2+
2*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a*x-2*a^2*x^2+2)
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.64

$$\int \frac{x \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{2\,ax \arcsin{(ax)} - \sqrt{-a^2x^2+1}\left(\arcsin{(ax)}^2 - 2\right)}{a^2}$$

```
[In] integrate(x*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] (2*a*x*arcsin(a*x) - sqrt(-a^2*x^2 + 1)*(arcsin(a*x)^2 - 2))/a^2
```

Sympy [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.89

$$\int \frac{x \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{2x \operatorname{asin}{(ax)}}{a} - \frac{\sqrt{-a^2x^2+1}\operatorname{asin}^2{(ax)}}{a^2} + \frac{2\sqrt{-a^2x^2+1}}{a^2} & \text{for}\ a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

```
[In] integrate(x*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((2*x*asin(a*x)/a - sqrt(-a**2*x**2 + 1)*asin(a*x)**2/a**2 + 2*sqr
t(-a**2*x**2 + 1)/a**2, Ne(a, 0)), (0, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.89

$$\int \frac{x \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{-a^2x^2+1}\arcsin{(ax)}^2}{a^2} + \frac{2\left(ax \arcsin{(ax)} + \sqrt{-a^2x^2+1}\right)}{a^2}$$

```
[In] integrate(x*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/a^2 + 2*(a*x*arcsin(a*x) + sqrt(-a^2*x^2
+ 1))/a^2
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.89

$$\int \frac{x \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{-a^2x^2+1}\arcsin{(ax)}^2}{a^2} + \frac{2\left(ax\arcsin{(ax)} + \sqrt{-a^2x^2+1}\right)}{a^2}$$

```
[In] integrate(x*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/a^2 + 2*(a*x*arcsin(a*x) + sqrt(-a^2*x^2
+ 1))/a^2
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x\,\mathrm{asin}(a\,x)^2}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x*asin(a*x)^2)/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] int((x*asin(a*x)^2)/(1 - a^2*x^2)^(1/2), x)
```

3.268 $\int \frac{\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 13

$$\int \frac{\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^3}{3a}$$

```
[Out] 1/3*arcsin(a*x)^3/a
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4737}

$$\int \frac{\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^3}{3a}$$

```
[In] Int[ArcSin[a*x]^2/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^3/(3*a)
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral} = \frac{\arcsin(ax)^3}{3a}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^3}{3a}$$

```
[In] Integrate[ArcSin[a*x]^2/Sqrt[1 - a^2*x^2],x]
[Out] ArcSin[a*x]^3/(3*a)
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.92

method	result	size
derivativedivides	$\frac{\arcsin(ax)^3}{3a}$	12
default	$\frac{\arcsin(ax)^3}{3a}$	12

```
[In] int(arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/3*arcsin(a*x)^3/a
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin\left(ax\right)^3}{3\,a}$$

```
[In] integrate(arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] 1/3*arcsin(a*x)^3/a
```

Sympy [A] (verification not implemented)

Time = 0.20 (sec) , antiderivative size = 10, normalized size of antiderivative = 0.77

$$\int \frac{\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{\operatorname{asin}^3(ax)}{3a} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

```
[In] integrate(asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
[Out] Piecewise((asin(a*x)**3/(3*a), Ne(a, 0)), (0, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^3}{3a}$$

```
[In] integrate(arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] 1/3*arcsin(a*x)^3/a
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^3}{3a}$$

```
[In] integrate(arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] 1/3*arcsin(a*x)^3/a
```

Mupad [B] (verification not implemented)

Time = 0.16 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \frac{\operatorname{asin}(a\,x)^3}{3\,a}$$

```
[In] int(asin(a*x)^2/(1 - a^2*x^2)^(1/2),x)
[Out] asin(a*x)^3/(3*a)
```

3.269 $\int \frac{\arcsin(ax)^2}{x\sqrt{1-a^2x^2}} dx$

Optimal result

Integrand size = 24, antiderivative size = 92

$$\int \frac{\arcsin(ax)^2}{x\sqrt{1-a^2x^2}} dx = -2\arcsin(ax)^2\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) + 2i\arcsin(ax)\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) - 2i\arcsin(ax)\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) - 2\operatorname{PolyLog}\left(3,-e^{i\arcsin(ax)}\right) + 2\operatorname{PolyLog}\left(3,e^{i\arcsin(ax)}\right)$$

```
[Out] -2*arcsin(a*x)^2*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))+2*I*arcsin(a*x)*polylog(
2,-I*a*x-(-a^2*x^2+1)^(1/2))-2*I*arcsin(a*x)*polylog(2,I*a*x+(-a^2*x^2+1)^(
1/2))-2*polylog(3,-I*a*x-(-a^2*x^2+1)^(1/2))+2*polylog(3,I*a*x+(-a^2*x^2+1)
^(1/2))
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4803, 4268, 2611, 2320, 6724}

$$\int \frac{\arcsin(ax)^2}{x\sqrt{1-a^2x^2}} dx = -2\arcsin(ax)^2\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) + 2i\arcsin(ax)\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) - 2i\arcsin(ax)\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) - 2\operatorname{PolyLog}\left(3,-e^{i\arcsin(ax)}\right) + 2\operatorname{PolyLog}\left(3,e^{i\arcsin(ax)}\right)$$

```
[In] Int[ArcSin[a*x]^2/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -2*ArcSin[a*x]^2*ArcTanh[E^(I*ArcSin[a*x])] + (2*I)*ArcSin[a*x]*PolyLog[2,
-E^(I*ArcSin[a*x])] - (2*I)*ArcSin[a*x]*PolyLog[2, E^(I*ArcSin[a*x])] - 2*P
olyLog[3, -E^(I*ArcSin[a*x])] + 2*PolyLog[3, E^(I*ArcSin[a*x])]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\text{integral} = \text{Subst}\left(\int x^2 \csc(x)\,dx, x, \arcsin(ax)\right)$$

$$
\begin{aligned}
&= -2\arcsin(ax)^2\text{arctanh}\left(e^{i\arcsin(ax)}\right) - 2\text{Subst}\left(\int x\log\left(1-e^{ix}\right)\,dx, x, \arcsin(ax)\right) \\
&\quad + 2\text{Subst}\left(\int x\log\left(1+e^{ix}\right)\,dx, x, \arcsin(ax)\right) \\
&= -2\arcsin(ax)^2\text{arctanh}\left(e^{i\arcsin(ax)}\right) + 2i\arcsin(ax)\,\text{PolyLog}\left(2, -e^{i\arcsin(ax)}\right) \\
&\quad - 2i\arcsin(ax)\,\text{PolyLog}\left(2, e^{i\arcsin(ax)}\right) \\
&\quad - 2i\text{Subst}\left(\int \text{PolyLog}\left(2, -e^{ix}\right)\,dx, x, \arcsin(ax)\right) \\
&\quad + 2i\text{Subst}\left(\int \text{PolyLog}\left(2, e^{ix}\right)\,dx, x, \arcsin(ax)\right) \\
&= -2\arcsin(ax)^2\text{arctanh}\left(e^{i\arcsin(ax)}\right) + 2i\arcsin(ax)\,\text{PolyLog}\left(2, -e^{i\arcsin(ax)}\right) \\
&\quad - 2i\arcsin(ax)\,\text{PolyLog}\left(2, e^{i\arcsin(ax)}\right) \\
&\quad - 2\text{Subst}\left(\int \frac{\text{PolyLog}(2,-x)}{x}\,dx, x, e^{i\arcsin(ax)}\right) \\
&\quad + 2\text{Subst}\left(\int \frac{\text{PolyLog}(2,x)}{x}\,dx, x, e^{i\arcsin(ax)}\right) \\
&= -2\arcsin(ax)^2\text{arctanh}\left(e^{i\arcsin(ax)}\right) + 2i\arcsin(ax)\,\text{PolyLog}\left(2, -e^{i\arcsin(ax)}\right) \\
&\quad - 2i\arcsin(ax)\,\text{PolyLog}\left(2, e^{i\arcsin(ax)}\right) \\
&\quad - 2\,\text{PolyLog}\left(3, -e^{i\arcsin(ax)}\right) + 2\,\text{PolyLog}\left(3, e^{i\arcsin(ax)}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.26

$$
\begin{aligned}
\int \frac{\arcsin(ax)^2}{x\sqrt{1-a^2x^2}}\,dx &= \arcsin(ax)^2\log\left(1-e^{i\arcsin(ax)}\right) - \arcsin(ax)^2\log\left(1+e^{i\arcsin(ax)}\right) \\
&\quad + 2i\arcsin(ax)\,\text{PolyLog}\left(2, -e^{i\arcsin(ax)}\right) \\
&\quad - 2i\arcsin(ax)\,\text{PolyLog}\left(2, e^{i\arcsin(ax)}\right) \\
&\quad - 2\,\text{PolyLog}\left(3, -e^{i\arcsin(ax)}\right) + 2\,\text{PolyLog}\left(3, e^{i\arcsin(ax)}\right)
\end{aligned}
$$

```
[In] Integrate[ArcSin[a*x]^2/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] ArcSin[a*x]^2*Log[1 - E^(I*ArcSin[a*x])] - ArcSin[a*x]^2*Log[1 + E^(I*ArcSi
n[a*x])] + (2*I)*ArcSin[a*x]*PolyLog[2, -E^(I*ArcSin[a*x])] - (2*I)*ArcSin[
a*x]*PolyLog[2, E^(I*ArcSin[a*x])] - 2*PolyLog[3, -E^(I*ArcSin[a*x])] + 2*P
olyLog[3, E^(I*ArcSin[a*x])]
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.75

method	result
default	$-\arcsin(ax)^2 \ln\left(1+iax+\sqrt{-a^2x^2+1}\right)+2i\arcsin(ax)\,\mathrm{polylog}\left(2,-iax-\sqrt{-a^2x^2+1}\right)-2\,\mathrm{p}$

```
[In] int(arcsin(a*x)^2/x/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] -arcsin(a*x)^2*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))+2*I*arcsin(a*x)*polylog(2,-I*
a*x-(-a^2*x^2+1)^(1/2))-2*polylog(3,-I*a*x-(-a^2*x^2+1)^(1/2))+arcsin(a*x)^
2*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))-2*I*arcsin(a*x)*polylog(2,I*a*x+(-a^2*x^2+
1)^(1/2))+2*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))
```

Fricas [F]

$$\int \frac{\arcsin(ax)^2}{x\sqrt{1-a^2x^2}}\,dx=\int \frac{\arcsin(ax)^2}{\sqrt{-a^2x^2+1}x}\,dx$$

```
[In] integrate(arcsin(a*x)^2/x/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/(a^2*x^3 - x), x)
```

Sympy [F]

$$\int \frac{\arcsin(ax)^2}{x\sqrt{1-a^2x^2}}\,dx=\int \frac{\operatorname{asin}^2(ax)}{x\sqrt{-(ax-1)(ax+1)}}\,dx$$

```
[In] integrate(asin(a*x)**2/x/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(asin(a*x)**2/(x*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Maxima [F]

$$\int \frac{\arcsin(ax)^2}{x\sqrt{1-a^2x^2}}\,dx=\int \frac{\arcsin(ax)^2}{\sqrt{-a^2x^2+1}x}\,dx$$

```
[In] integrate(arcsin(a*x)^2/x/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x), x)
```

Giac [F]

$$\int \frac{\arcsin(ax)^2}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin{(ax)}^2}{\sqrt{-a^2x^2+1}x}\,dx$$

```
[In] integrate(arcsin(a*x)^2/x/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^2}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^2}{x\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(asin(a*x)^2/(x*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^2/(x*(1 - a^2*x^2)^(1/2)), x)
```

3.270 $\int \frac{\arcsin(ax)^2}{x^2\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 76

$$\int \frac{\arcsin(ax)^2}{x^2\sqrt{1-a^2x^2}}\,dx = -ia\arcsin(ax)^2 - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{x} + 2a\arcsin(ax)\log\left(1-e^{2i\arcsin(ax)}\right) - ia\,\text{PolyLog}\left(2,e^{2i\arcsin(ax)}\right)$$

```
[Out] -I*a*arcsin(a*x)^2+2*a*arcsin(a*x)*ln(1-(I*a*x+(-a^2*x^2+1)^(1/2))^2)-I*a*p
olylog(2,(I*a*x+(-a^2*x^2+1)^(1/2))^2)-arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/x
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4771, 4721, 3798, 2221, 2317, 2438}

$$\int \frac{\arcsin(ax)^2}{x^2\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{x} - ia\,\text{PolyLog}\left(2,e^{2i\arcsin(ax)}\right) - ia\arcsin(ax)^2 + 2a\arcsin(ax)\log\left(1-e^{2i\arcsin(ax)}\right)$$

```
[In] Int[ArcSin[a*x]^2/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (-I)*a*ArcSin[a*x]^2 - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/x + 2*a*ArcSin[a*x
]*Log[1 - E^((2*I)*ArcSin[a*x])] - I*a*PolyLog[2, E^((2*I)*ArcSin[a*x])]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
```

```
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{x} + (2a)\int \frac{\arcsin(ax)}{x}\,dx \\ &= -\frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{x} + (2a)\text{Subst}(\int x\cot(x)\,dx, x, \arcsin(ax)) \\ &= -ia\arcsin(ax)^2 - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{x} - (4ia)\text{Subst}\left(\int \frac{e^{2ix}x}{1-e^{2ix}}\,dx, x, \arcsin(ax)\right)\end{aligned}$$

$$= -ia\arcsin(ax)^2 - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{x} + 2a\arcsin(ax)\log\left(1-e^{2i\arcsin(ax)}\right) - (2a)\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(ax)\right)$$

$$= -ia\arcsin(ax)^2 - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{x} + 2a\arcsin(ax)\log\left(1-e^{2i\arcsin(ax)}\right) + (ia)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(ax)}\right)$$

$$= -ia\arcsin(ax)^2 - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{x} + 2a\arcsin(ax)\log\left(1-e^{2i\arcsin(ax)}\right) - ia\,\text{PolyLog}\left(2, e^{2i\arcsin(ax)}\right)$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.95

$$\int \frac{\arcsin(ax)^2}{x^2\sqrt{1-a^2x^2}}\,dx = \arcsin(ax)\left(-\frac{\left(iax+\sqrt{1-a^2x^2}\right)\arcsin(ax)}{x} + 2a\log\left(1-e^{2i\arcsin(ax)}\right)\right) - ia\,\text{PolyLog}\left(2, e^{2i\arcsin(ax)}\right)$$

```
[In] Integrate[ArcSin[a*x]^2/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] ArcSin[a*x]*(-(((I*a*x + Sqrt[1 - a^2*x^2])*ArcSin[a*x])/x) + 2*a*Log[1 - E
^((2*I)*ArcSin[a*x])]) - I*a*PolyLog[2, E^((2*I)*ArcSin[a*x])]
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.86

method	result
default	$\frac{\left(iax-\sqrt{-a^2x^2+1}\right)\arcsin(ax)^2}{x} - 2ia\left(i\arcsin(ax)\ln\left(1+iax+\sqrt{-a^2x^2+1}\right) + i\arcsin(ax)\ln\left(1-iax\right.\right.$

```
[In] int(arcsin(a*x)^2/x^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] (I*a*x-(-a^2*x^2+1)^(1/2))*arcsin(a*x)^2/x-2*I*a*(I*arcsin(a*x)*ln(1+I*a*x+
(-a^2*x^2+1)^(1/2))+I*arcsin(a*x)*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))+arcsin(a*x
)^2+polylog(2,-I*a*x-(-a^2*x^2+1)^(1/2))+polylog(2,I*a*x+(-a^2*x^2+1)^(1/2)
))
```

Fricas [F]

$$\int \frac{\arcsin(ax)^2}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin\left(ax\right)^2}{\sqrt{-a^2x^2+1}x^2}\,dx$$

[In] integrate(arcsin(a*x)^2/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/(a^2*x^4 - x^2), x)

Sympy [F]

$$\int \frac{\arcsin(ax)^2}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\operatorname{asin}^2\left(ax\right)}{x^2\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

[In] integrate(asin(a*x)**2/x**2/(-a**2*x**2+1)**(1/2),x)

[Out] Integral(asin(a*x)**2/(x**2*sqrt(-(a*x - 1)*(a*x + 1))), x)

Maxima [F]

$$\int \frac{\arcsin(ax)^2}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin\left(ax\right)^2}{\sqrt{-a^2x^2+1}x^2}\,dx$$

[In] integrate(arcsin(a*x)^2/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] -(sqrt(a*x + 1)*sqrt(-a*x + 1)*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))^2 - 2*a*x*integrate(arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))/x, x))/x

Giac [F]

$$\int \frac{\arcsin(ax)^2}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin\left(ax\right)^2}{\sqrt{-a^2x^2+1}x^2}\,dx$$

[In] integrate(arcsin(a*x)^2/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")

[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x^2), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^2}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^2}{x^2\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(asin(a*x)^2/(x^2*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^2/(x^2*(1 - a^2*x^2)^(1/2)), x)
```

3.271 $\int \frac{\arcsin(ax)^2}{x^3\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 163

$$\begin{aligned}\int \frac{\arcsin(ax)^2}{x^3\sqrt{1-a^2x^2}}\,dx =& -\frac{a\arcsin(ax)}{x}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{2x^2}\\ &-a^2\arcsin(ax)^2\text{arctanh}\left(e^{i\arcsin(ax)}\right)-a^2\text{arctanh}\left(\sqrt{1-a^2x^2}\right)\\ &+ia^2\arcsin(ax)\,\text{PolyLog}\left(2,-e^{i\arcsin(ax)}\right)\\ &-ia^2\arcsin(ax)\,\text{PolyLog}\left(2,e^{i\arcsin(ax)}\right)\\ &-a^2\,\text{PolyLog}\left(3,-e^{i\arcsin(ax)}\right)+a^2\,\text{PolyLog}\left(3,e^{i\arcsin(ax)}\right)\end{aligned}$$

```
[Out] -a*arcsin(a*x)/x-a^2*arcsin(a*x)^2*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))-a^2*ar
ctanh((-a^2*x^2+1)^(1/2))+I*a^2*arcsin(a*x)*polylog(2,-I*a*x-(-a^2*x^2+1)^(
1/2))-I*a^2*arcsin(a*x)*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))-a^2*polylog(3,-
I*a*x-(-a^2*x^2+1)^(1/2))+a^2*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))-1/2*arcsi
n(a*x)^2*(-a^2*x^2+1)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules

used = {4789, 4803, 4268, 2611, 2320, 6724, 4723, 272, 65, 214}

$$\int \frac{\arcsin(ax)^2}{x^3\sqrt{1-a^2x^2}}\,dx = a^2\left(-\arcsin(ax)^2\right)\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) + ia^2\arcsin(ax)\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) - ia^2\arcsin(ax)\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) - a^2\operatorname{PolyLog}\left(3,-e^{i\arcsin(ax)}\right) + a^2\operatorname{PolyLog}\left(3,e^{i\arcsin(ax)}\right) - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{2x^2} - a^2\operatorname{arctanh}\left(\sqrt{1-a^2x^2}\right) - \frac{a\arcsin(ax)}{x}$$

```
[In] Int[ArcSin[a*x]^2/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -((a*ArcSin[a*x])/x) - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(2*x^2) - a^2*ArcS
in[a*x]^2*ArcTanh[E^(I*ArcSin[a*x])] - a^2*ArcTanh[Sqrt[1 - a^2*x^2]] + I*a
^2*ArcSin[a*x]*PolyLog[2, -E^(I*ArcSin[a*x])] - I*a^2*ArcSin[a*x]*PolyLog[2
, E^(I*ArcSin[a*x])] - a^2*PolyLog[3, -E^(I*ArcSin[a*x])] + a^2*PolyLog[3,
E^(I*ArcSin[a*x])]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{2x^2}+a\int\frac{\arcsin(ax)}{x^2}\,dx+\frac{1}{2}a^2\int\frac{\arcsin(ax)^2}{x\sqrt{1-a^2x^2}}\,dx\\
&= -\frac{a\arcsin(ax)}{x}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{2x^2}\\
&\quad+\frac{1}{2}a^2\text{Subst}\left(\int x^2\csc(x)\,dx,x,\arcsin(ax)\right)+a^2\int\frac{1}{x\sqrt{1-a^2x^2}}\,dx\\
&= -\frac{a\arcsin(ax)}{x}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{2x^2}\\
&\quad-a^2\arcsin(ax)^2\text{arctanh}\left(e^{i\arcsin(ax)}\right)+\frac{1}{2}a^2\text{Subst}\left(\int\frac{1}{x\sqrt{1-a^2x}}\,dx,x,x^2\right)\\
&\quad-a^2\text{Subst}\left(\int x\log\left(1-e^{ix}\right)\,dx,x,\arcsin(ax)\right)\\
&\quad+a^2\text{Subst}\left(\int x\log\left(1+e^{ix}\right)\,dx,x,\arcsin(ax)\right)\\
&= -\frac{a\arcsin(ax)}{x}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{2x^2}-a^2\arcsin(ax)^2\text{arctanh}\left(e^{i\arcsin(ax)}\right)\\
&\quad+ia^2\arcsin(ax)\,\text{PolyLog}\left(2,-e^{i\arcsin(ax)}\right)-ia^2\arcsin(ax)\,\text{PolyLog}\left(2,e^{i\arcsin(ax)}\right)\\
&\quad-\left(ia^2\right)\text{Subst}\left(\int\text{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(ax)\right)\\
&\quad+\left(ia^2\right)\text{Subst}\left(\int\text{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(ax)\right)\\
&\quad-\text{Subst}\left(\int\frac{1}{\frac{1}{a^2}-\frac{x^2}{a^2}}\,dx,x,\sqrt{1-a^2x^2}\right)\\
&= -\frac{a\arcsin(ax)}{x}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{2x^2}-a^2\arcsin(ax)^2\text{arctanh}\left(e^{i\arcsin(ax)}\right)\\
&\quad-a^2\text{arctanh}\left(\sqrt{1-a^2x^2}\right)+ia^2\arcsin(ax)\,\text{PolyLog}\left(2,-e^{i\arcsin(ax)}\right)\\
&\quad-ia^2\arcsin(ax)\,\text{PolyLog}\left(2,e^{i\arcsin(ax)}\right)\\
&\quad-a^2\text{Subst}\left(\int\frac{\text{PolyLog}(2,-x)}{x}\,dx,x,e^{i\arcsin(ax)}\right)\\
&\quad+a^2\text{Subst}\left(\int\frac{\text{PolyLog}(2,x)}{x}\,dx,x,e^{i\arcsin(ax)}\right)\\
&= -\frac{a\arcsin(ax)}{x}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)^2}{2x^2}-a^2\arcsin(ax)^2\text{arctanh}\left(e^{i\arcsin(ax)}\right)\\
&\quad-a^2\text{arctanh}\left(\sqrt{1-a^2x^2}\right)+ia^2\arcsin(ax)\,\text{PolyLog}\left(2,-e^{i\arcsin(ax)}\right)\\
&\quad-ia^2\arcsin(ax)\,\text{PolyLog}\left(2,e^{i\arcsin(ax)}\right)\\
&\quad-a^2\,\text{PolyLog}\left(3,-e^{i\arcsin(ax)}\right)+a^2\,\text{PolyLog}\left(3,e^{i\arcsin(ax)}\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 1.16 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.19

$$\int \frac{\arcsin(ax)^2}{x^3\sqrt{1-a^2x^2}}\,dx = \frac{1}{8}a^2\left(-4\arcsin(ax)\cot\left(\frac{1}{2}\arcsin(ax)\right) - \arcsin(ax)^2\csc^2\left(\frac{1}{2}\arcsin(ax)\right) + 4\arcsin(ax)^2\left(\log\left(1-e^{i\arcsin(ax)}\right)-\log\left(1+e^{i\arcsin(ax)}\right)\right) + 8\log\left(\tan\left(\frac{1}{2}\arcsin(ax)\right)\right) + 8i\arcsin(ax)\left(\text{PolyLog}\left(2,-e^{i\arcsin(ax)}\right)-\text{PolyLog}\left(2,e^{i\arcsin(ax)}\right)\right) + 8\left(-\text{PolyLog}\left(3,-e^{i\arcsin(ax)}\right)+\text{PolyLog}\left(3,e^{i\arcsin(ax)}\right)\right) + \arcsin(ax)^2\sec^2\left(\frac{1}{2}\arcsin(ax)\right) - 4\arcsin(ax)\tan\left(\frac{1}{2}\arcsin(ax)\right)\right)$$

```
[In] Integrate[ArcSin[a*x]^2/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (a^2*(-4*ArcSin[a*x]*Cot[ArcSin[a*x]/2] - ArcSin[a*x]^2*Csc[ArcSin[a*x]/2]^
2 + 4*ArcSin[a*x]^2*(Log[1 - E^(I*ArcSin[a*x])] - Log[1 + E^(I*ArcSin[a*x])
]) + 8*Log[Tan[ArcSin[a*x]/2]] + (8*I)*ArcSin[a*x]*(PolyLog[2, -E^(I*ArcSin
[a*x])] - PolyLog[2, E^(I*ArcSin[a*x])]) + 8*(-PolyLog[3, -E^(I*ArcSin[a*x]
)] + PolyLog[3, E^(I*ArcSin[a*x])]) + ArcSin[a*x]^2*Sec[ArcSin[a*x]/2]^2 -
4*ArcSin[a*x]*Tan[ArcSin[a*x]/2]))/8
```

Maple [A] (verified)

Time = 0.19 (sec) , antiderivative size = 254, normalized size of antiderivative = 1.56

method	result
default	$-\frac{\sqrt{-a^2x^2+1}\,\arcsin(ax)\left(a^2x^2\arcsin(ax)-2ax\sqrt{-a^2x^2+1}-\arcsin(ax)\right)}{2(a^2x^2-1)x^2} - \frac{a^2\left(\arcsin(ax)^2\ln\left(1+iax+\sqrt{-a^2x^2+1}\right)-\arcsin(ax)^2\right.}{}$

```
[In] int(arcsin(a*x)^2/x^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)/x^2*arcsin(a*x)*(a^2*x^2*arcsin(a*x)-2*
a*x*(-a^2*x^2+1)^(1/2)-arcsin(a*x))-1/2*a^2*(arcsin(a*x)^2*ln(1+I*a*x+(-a^2
*x^2+1)^(1/2))-arcsin(a*x)^2*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))-2*I*arcsin(a*x)
*polylog(2,-I*a*x-(-a^2*x^2+1)^(1/2))+2*I*arcsin(a*x)*polylog(2,I*a*x+(-a^2
*x^2+1)^(1/2))+4*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))+2*polylog(3,-I*a*x-(-a^2
*x^2+1)^(1/2))-2*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{\arcsin(ax)^2}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin\left(ax\right)^2}{\sqrt{-a^2x^2+1}x^3}\,dx$$

[In] integrate(arcsin(a*x)^2/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^2/(a^2*x^5 - x^3), x)

Sympy [F]

$$\int \frac{\arcsin(ax)^2}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\operatorname{asin}^2\left(ax\right)}{x^3\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

[In] integrate(asin(a*x)**2/x**3/(-a**2*x**2+1)**(1/2),x)

[Out] Integral(asin(a*x)**2/(x**3*sqrt(-(a*x - 1)*(a*x + 1))), x)

Maxima [F]

$$\int \frac{\arcsin(ax)^2}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin\left(ax\right)^2}{\sqrt{-a^2x^2+1}x^3}\,dx$$

[In] integrate(arcsin(a*x)^2/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x^3), x)

Giac [F]

$$\int \frac{\arcsin(ax)^2}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin\left(ax\right)^2}{\sqrt{-a^2x^2+1}x^3}\,dx$$

[In] integrate(arcsin(a*x)^2/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")

[Out] integrate(arcsin(a*x)^2/(sqrt(-a^2*x^2 + 1)*x^3), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^2}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^2}{x^3\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(asin(a*x)^2/(x^3*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^2/(x^3*(1 - a^2*x^2)^(1/2)), x)
```

3.272 $\int \frac{\arcsin(ax)^2}{\sqrt{c-a^2cx^2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 42

$$\int \frac{\arcsin(ax)^2}{\sqrt{c-a^2cx^2}}\,dx = \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a\sqrt{c-a^2cx^2}}$$

```
[Out] 1/3*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.045, Rules used = {4737}

$$\int \frac{\arcsin(ax)^2}{\sqrt{c-a^2cx^2}}\,dx = \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a\sqrt{c-a^2cx^2}}$$

```
[In] Int[ArcSin[a*x]^2/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a*Sqrt[c - a^2*c*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a\sqrt{c-a^2cx^2}}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)^2}{\sqrt{c-a^2cx^2}}\,dx = \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a\sqrt{c-a^2cx^2}}$$

```
[In] Integrate[ArcSin[a*x]^2/Sqrt[c - a^2*c*x^2],x]
[Out] (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a*Sqrt[c - a^2*c*x^2])
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 52, normalized size of antiderivative = 1.24

method	result	size
default	$-\frac{\sqrt{-c(a^2x^2-1)}\,\sqrt{-a^2x^2+1}\,\arcsin(ax)^3}{3ac(a^2x^2-1)}$	52

```
[In] int(arcsin(a*x)^2/(-a^2*c*x^2+c)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/3*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c/(a^2*x^2-1)*arcsin(a*x)^
3
```

Fricas [F]

$$\int \frac{\arcsin(ax)^2}{\sqrt{c-a^2cx^2}}\,dx = \int \frac{\arcsin(ax)^2}{\sqrt{-a^2cx^2+c}}\,dx$$

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^2/(a^2*c*x^2 - c), x)
```

Sympy [F]

$$\int \frac{\arcsin(ax)^2}{\sqrt{c-a^2cx^2}}\,dx = \int \frac{\operatorname{asin}^2(ax)}{\sqrt{-c(ax-1)(ax+1)}}\,dx$$

```
[In] integrate(asin(a*x)**2/(-a**2*c*x**2+c)**(1/2),x)
[Out] Integral(asin(a*x)**2/sqrt(-c*(a*x - 1)*(a*x + 1)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.33

$$\int \frac{\arcsin(ax)^2}{\sqrt{c - a^2cx^2}}\, dx = \frac{\arcsin{(ax)}^3}{3\, a\sqrt{c}}$$

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] 1/3*arcsin(a*x)^3/(a*sqrt(c))
```

Giac [F]

$$\int \frac{\arcsin(ax)^2}{\sqrt{c - a^2cx^2}}\, dx = \int \frac{\arcsin{(ax)}^2}{\sqrt{-a^2cx^2 + c}}\, dx$$

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^2/sqrt(-a^2*c*x^2 + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^2}{\sqrt{c - a^2cx^2}}\, dx = \int \frac{{\mathrm{asin}\left(a\,x\right)}^2}{\sqrt{c-a^2\,c\,x^2}}\, dx$$

```
[In] int(asin(a*x)^2/(c - a^2*c*x^2)^(1/2),x)
[Out] int(asin(a*x)^2/(c - a^2*c*x^2)^(1/2), x)
```

3.273 $\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 179

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{3/2}}\,dx = \frac{x\arcsin(ax)^2}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\arcsin(ax)^2}{ac\sqrt{c-a^2cx^2}} + \frac{2\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}}$$

```
[Out] x*arcsin(a*x)^2/c/(-a^2*c*x^2+c)^(1/2)-I*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a
/c/(-a^2*c*x^2+c)^(1/2)+2*arcsin(a*x)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)*(-
a^2*x^2+1)^(1/2)/a/c/(-a^2*c*x^2+c)^(1/2)-I*polylog(2,-(I*a*x+(-a^2*x^2+1)^
(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4745, 4765, 3800, 2221, 2317, 2438}

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{3/2}}\,dx = -\frac{i\sqrt{1-a^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^2}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\arcsin(ax)^2}{ac\sqrt{c-a^2cx^2}} + \frac{2\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}}$$

```
[In] Int[ArcSin[a*x]^2/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*ArcSin[a*x]^2)/(c*Sqrt[c - a^2*c*x^2]) - (I*Sqrt[1 - a^2*x^2]*ArcSin[a*x
]^2)/(a*c*Sqrt[c - a^2*c*x^2]) + (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*Log[1 + E
```

```
^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2]) - (I*Sqrt[1 - a^2*x^2]*Pol
yLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{x\arcsin(ax)^2}{c\sqrt{c-a^2cx^2}} - \frac{\left(2a\sqrt{1-a^2x^2}\right)\int\frac{x\arcsin(ax)}{1-a^2x^2}\,dx}{c\sqrt{c-a^2cx^2}}$$

$$= \frac{x\arcsin(ax)^2}{c\sqrt{c-a^2cx^2}} - \frac{\left(2\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int x\tan(x)\,dx, x, \arcsin(ax)\right)}{ac\sqrt{c-a^2cx^2}}$$

$$= \frac{x\arcsin(ax)^2}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\arcsin(ax)^2}{ac\sqrt{c-a^2cx^2}} + \frac{\left(4i\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int \frac{e^{2ix}x}{1+e^{2ix}}\,dx, x, \arcsin(ax)\right)}{ac\sqrt{c-a^2cx^2}}$$

$$= \frac{x\arcsin(ax)^2}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\arcsin(ax)^2}{ac\sqrt{c-a^2cx^2}} + \frac{2\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}} - \frac{\left(2\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(ax)\right)}{ac\sqrt{c-a^2cx^2}}$$

$$= \frac{x\arcsin(ax)^2}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\arcsin(ax)^2}{ac\sqrt{c-a^2cx^2}} + \frac{2\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}} + \frac{\left(i\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}}$$

$$= \frac{x\arcsin(ax)^2}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\arcsin(ax)^2}{ac\sqrt{c-a^2cx^2}} + \frac{2\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\,\text{PolyLog}\left(2, -e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 108, normalized size of antiderivative = 0.60

$$\int \frac{\arcsin(ax)^2}{\left(c-a^2cx^2\right)^{3/2}}\,dx = \frac{\arcsin(ax)\left(ax\arcsin(ax)+\sqrt{1-a^2x^2}\left(-i\arcsin(ax)+2\log\left(1+e^{2i\arcsin(ax)}\right)\right)\right)-i}{ac\sqrt{c\left(1-a^2x^2\right)}}$$

```
[In] Integrate[ArcSin[a*x]^2/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (ArcSin[a*x]*(a*x*ArcSin[a*x] + Sqrt[1 - a^2*x^2]*((-I)*ArcSin[a*x] + 2*Log
[1 + E^((2*I)*ArcSin[a*x])])) - I*Sqrt[1 - a^2*x^2]*PolyLog[2, -E^((2*I)*Ar
cSin[a*x])])/(a*c*Sqrt[c*(1 - a^2*x^2)])
```

Maple [A] (verified)

Time = 0.15 (sec) , antiderivative size = 169, normalized size of antiderivative = 0.94

method	result
default	$-\frac{\sqrt{-c(a^2x^2-1)}\left(i\sqrt{-a^2x^2+1}+ax\right)\arcsin(ax)^2}{c^2a(a^2x^2-1)}+\frac{i\sqrt{-a^2x^2+1}\,\sqrt{-c(a^2x^2-1)}\left(2i\arcsin(ax)\ln\left(1+\left(iax+\sqrt{-a^2x^2+1}\right)^2\right)+2\arcs}{c^2a(a^2x^2-1)}$

[In] int(arcsin(a*x)^2/(-a^2*c*x^2+c)^(3/2),x,method=_RETURNVERBOSE)

[Out] -(-c*(a^2*x^2-1))^(1/2)*(I*(-a^2*x^2+1)^(1/2)+a*x)*arcsin(a*x)^2/c^2/a/(a^2*x^2-1)+I*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)/c^2/a/(a^2*x^2-1)*(2*I*arcsin(a*x)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)+2*arcsin(a*x)^2+polylog(2,-(I*a*x+(-a^2*x^2+1)^(1/2))^2))

Fricas [F]

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{3/2}}\,dx=\int \frac{\arcsin(ax)^2}{(-a^2cx^2+c)^{\frac{3}{2}}}\,dx$$

[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")

[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^2/(a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2), x)

Sympy [F]

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{3/2}}\,dx=\int \frac{\operatorname{asin}^2(ax)}{(-c(ax-1)(ax+1))^{\frac{3}{2}}}\,dx$$

[In] integrate(asin(a*x)**2/(-a**2*c*x**2+c)**(3/2),x)

[Out] Integral(asin(a*x)**2/(-c*(a*x - 1)*(a*x + 1))**(3/2), x)

Maxima [F]

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\arcsin{(ax)}^2}{(-a^2cx^2+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(3/2), x)
```

Giac [F]

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\arcsin{(ax)}^2}{(-a^2cx^2+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^2}{(c-a^2\,c\,x^2)^{3/2}}\,dx$$

```
[In] int(asin(a*x)^2/(c - a^2*c*x^2)^(3/2),x)
[Out] int(asin(a*x)^2/(c - a^2*c*x^2)^(3/2), x)
```

3.274 $\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{5/2}} \, dx$

Optimal result

Integrand size = 22, antiderivative size = 283

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{5/2}} \, dx = \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)}{3ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^2}{3c(c-a^2cx^2)^{3/2}} + \frac{2x\arcsin(ax)^2}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)^2}{3ac^2\sqrt{c-a^2cx^2}} + \frac{4\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{3ac^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{3ac^2\sqrt{c-a^2cx^2}}$$

```
[Out] 1/3*x*arcsin(a*x)^2/c/(-a^2*c*x^2+c)^(3/2)+1/3*x/c^2/(-a^2*c*x^2+c)^(1/2)+2
/3*x*arcsin(a*x)^2/c^2/(-a^2*c*x^2+c)^(1/2)-1/3*arcsin(a*x)/a/c^2/(-a^2*x^2
+1)^(1/2)/(-a^2*c*x^2+c)^(1/2)-2/3*I*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a/c^2
/(-a^2*c*x^2+c)^(1/2)+4/3*arcsin(a*x)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)*(-
a^2*x^2+1)^(1/2)/a/c^2/(-a^2*c*x^2+c)^(1/2)-2/3*I*polylog(2,-(I*a*x+(-a^2*x
^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c^2/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 283, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.409, Rules used = {4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197}

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{5/2}}\,dx = -\frac{2i\sqrt{1-a^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{3ac^2\sqrt{c-a^2cx^2}} + \frac{2x\arcsin(ax)^2}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)^2}{3ac^2\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)}{3ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{4\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{3ac^2\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^2}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{x}{3c^2\sqrt{c-a^2cx^2}}$$

```
[In] Int[ArcSin[a*x]^2/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] x/(3*c^2*Sqrt[c - a^2*c*x^2]) - ArcSin[a*x]/(3*a*c^2*Sqrt[1 - a^2*x^2]*Sqrt
[c - a^2*c*x^2]) + (x*ArcSin[a*x]^2)/(3*c*(c - a^2*c*x^2)^(3/2)) + (2*x*Arc
Sin[a*x]^2)/(3*c^2*Sqrt[c - a^2*c*x^2]) - (((2*I)/3)*Sqrt[1 - a^2*x^2]*ArcS
in[a*x]^2)/(a*c^2*Sqrt[c - a^2*c*x^2]) + (4*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*L
og[1 + E^((2*I)*ArcSin[a*x])])/(3*a*c^2*Sqrt[c - a^2*c*x^2]) - (((2*I)/3)*S
qrt[1 - a^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c^2*Sqrt[c - a^2*c*
x^2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\text{integral} = \frac{x\arcsin(ax)^2}{3c\,(c-a^2cx^2)^{3/2}} + \frac{2\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{3/2}}\,dx}{3c} - \frac{\left(2a\sqrt{1-a^2x^2}\right)\int \frac{x\arcsin(ax)}{(1-a^2x^2)^2}\,dx}{3c^2\sqrt{c-a^2cx^2}}$$

$$= -\frac{\arcsin(ax)}{3ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^2}{3c(c-a^2cx^2)^{3/2}} + \frac{2x\arcsin(ax)^2}{3c^2\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\int\frac{1}{(1-a^2x^2)^{3/2}}\,dx}{3c^2\sqrt{c-a^2cx^2}} - \frac{\left(4a\sqrt{1-a^2x^2}\right)\int\frac{x\arcsin(ax)}{1-a^2x^2}\,dx}{3c^2\sqrt{c-a^2cx^2}}$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)}{3ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^2}{3c(c-a^2cx^2)^{3/2}} + \frac{2x\arcsin(ax)^2}{3c^2\sqrt{c-a^2cx^2}} - \frac{\left(4\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int x\tan(x)\,dx, x, \arcsin(ax)\right)}{3ac^2\sqrt{c-a^2cx^2}}$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)}{3ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^2}{3c(c-a^2cx^2)^{3/2}} + \frac{2x\arcsin(ax)^2}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)^2}{3ac^2\sqrt{c-a^2cx^2}} + \frac{\left(8i\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int\frac{e^{2ix}x}{1+e^{2ix}}\,dx, x, \arcsin(ax)\right)}{3ac^2\sqrt{c-a^2cx^2}}$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)}{3ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^2}{3c(c-a^2cx^2)^{3/2}} + \frac{2x\arcsin(ax)^2}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)^2}{3ac^2\sqrt{c-a^2cx^2}} + \frac{4\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{3ac^2\sqrt{c-a^2cx^2}} - \frac{\left(4\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx, x, \arcsin(ax)\right)}{3ac^2\sqrt{c-a^2cx^2}}$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)}{3ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^2}{3c(c-a^2cx^2)^{3/2}} + \frac{2x\arcsin(ax)^2}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)^2}{3ac^2\sqrt{c-a^2cx^2}} + \frac{4\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{3ac^2\sqrt{c-a^2cx^2}} + \frac{\left(2i\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(ax)}\right)}{3ac^2\sqrt{c-a^2cx^2}}$$

$$= \frac{x}{3c^2\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)}{3ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^2}{3c(c-a^2cx^2)^{3/2}} + \frac{2x\arcsin(ax)^2}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)^2}{3ac^2\sqrt{c-a^2cx^2}} + \frac{4\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{3ac^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\,\text{PolyLog}\left(2, -e^{2i\arcsin(ax)}\right)}{3ac^2\sqrt{c-a^2cx^2}}$$

Mathematica [A] (verified)

Time = 0.50 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.53

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{5/2}}\,dx = \frac{ax+\left(-2i\sqrt{1-a^2x^2}+ax\left(2+\frac{1}{1-a^2x^2}\right)\right)\arcsin(ax)^2+\frac{\arcsin(ax)\left(-1+(4-4a^2x^2)\log\left(1+e^{2i\arcsin(ax)}\right)\right)}{\sqrt{1-a^2x^2}}}{3ac^2\sqrt{c-a^2cx^2}}$$

```
[In] Integrate[ArcSin[a*x]^2/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] (a*x + ((-2*I)*Sqrt[1 - a^2*x^2] + a*x*(2 + (1 - a^2*x^2)^(-1)))*ArcSin[a*x
]^2 + (ArcSin[a*x]*(-1 + (4 - 4*a^2*x^2)*Log[1 + E^((2*I)*ArcSin[a*x])]))/S
qrt[1 - a^2*x^2] - (2*I)*Sqrt[1 - a^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[a*x]
)])/(3*a*c^2*Sqrt[c - a^2*c*x^2])
```

Maple [A] (verified)

Time = 0.19 (sec) , antiderivative size = 365, normalized size of antiderivative = 1.29

method	result
default	$-\frac{\sqrt{-c(a^2x^2-1)}\left(2i\sqrt{-a^2x^2+1}\,a^2x^2+2a^3x^3-2i\sqrt{-a^2x^2+1}-3ax\right)\left(-2i\arcsin(ax)a^4x^4-2\arcsin(ax)\sqrt{-a^2x^2+1}\,a^3x^3+i\sqrt{-a^2x^2+\ldots}\right.}{3c^3(3a^6x^6-\ldots}$

```
[In] int(arcsin(a*x)^2/(-a^2*c*x^2+c)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*(-c*(a^2*x^2-1))^(1/2)*(2*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+2*a^3*x^3-2*I*(
-a^2*x^2+1)^(1/2)-3*a*x)*(-2*I*arcsin(a*x)*a^4*x^4-2*arcsin(a*x)*(-a^2*x^2+
1)^(1/2)*a^3*x^3+I*(-a^2*x^2+1)^(1/2)*a^3*x^3-a^4*x^4+3*arcsin(a*x)^2*a^2*x
^2+4*I*arcsin(a*x)*a^2*x^2+3*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a*x-I*(-a^2*x^2
+1)^(1/2)*a*x+3*a^2*x^2-4*arcsin(a*x)^2-2*I*arcsin(a*x)-2)/c^3/(3*a^6*x^6-1
0*a^4*x^4+11*a^2*x^2-4)/a+2/3*I*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)*(
2*I*arcsin(a*x)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)+2*arcsin(a*x)^2+polylog(
2,-(I*a*x+(-a^2*x^2+1)^(1/2))^2))/c^3/(a^2*x^2-1)/a
```

Fricas [F]

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{5/2}}\,dx = \int \frac{\arcsin(ax)^2}{(-a^2cx^2+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^2/(a^6*c^3*x^6 - 3*a^4*c^3*x^4 +
 3*a^2*c^3*x^2 - c^3), x)
```

Sympy [F]

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{5/2}}\,dx = \int \frac{\operatorname{asin}^2(ax)}{\left(-c(ax-1)(ax+1)\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(asin(a*x)**2/(-a**2*c*x**2+c)**(5/2),x)
[Out] Integral(asin(a*x)**2/(-c*(a*x - 1)*(a*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{5/2}}\,dx = \int \frac{\arcsin(ax)^2}{(-a^2cx^2+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(5/2), x)
```

Giac [F]

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{5/2}}\,dx = \int \frac{\arcsin(ax)^2}{(-a^2cx^2+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(5/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{5/2}}\,dx = \int \frac{\operatorname{asin}(a\,x)^2}{(c-a^2\,c\,x^2)^{5/2}}\,dx$$

```
[In] int(asin(a*x)^2/(c - a^2*c*x^2)^(5/2),x)
[Out] int(asin(a*x)^2/(c - a^2*c*x^2)^(5/2), x)
```

3.275 $\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{7/2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 390

$$
\begin{aligned}
\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{7/2}}\,dx &= \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3(1-a^2x^2)\sqrt{c-a^2cx^2}} \\
&- \frac{\arcsin(ax)}{10ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{4\arcsin(ax)}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} \\
&+ \frac{x\arcsin(ax)^2}{5c(c-a^2cx^2)^{5/2}} + \frac{4x\arcsin(ax)^2}{15c^2(c-a^2cx^2)^{3/2}} + \frac{8x\arcsin(ax)^2}{15c^3\sqrt{c-a^2cx^2}} \\
&- \frac{8i\sqrt{1-a^2x^2}\arcsin(ax)^2}{15ac^3\sqrt{c-a^2cx^2}} + \frac{16\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{15ac^3\sqrt{c-a^2cx^2}} \\
&- \frac{8i\sqrt{1-a^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{15ac^3\sqrt{c-a^2cx^2}}
\end{aligned}
$$

```
[Out] 1/5*x*arcsin(a*x)^2/c/(-a^2*c*x^2+c)^(5/2)+4/15*x*arcsin(a*x)^2/c^2/(-a^2*c
*x^2+c)^(3/2)+1/3*x/c^3/(-a^2*c*x^2+c)^(1/2)+1/30*x/c^3/(-a^2*x^2+1)/(-a^2*
c*x^2+c)^(1/2)-1/10*arcsin(a*x)/a/c^3/(-a^2*x^2+1)^(3/2)/(-a^2*c*x^2+c)^(1/
2)+8/15*x*arcsin(a*x)^2/c^3/(-a^2*c*x^2+c)^(1/2)-4/15*arcsin(a*x)/a/c^3/(-a
^2*x^2+1)^(1/2)/(-a^2*c*x^2+c)^(1/2)-8/15*I*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2
)/a/c^3/(-a^2*c*x^2+c)^(1/2)+16/15*arcsin(a*x)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/
2))^2)*(-a^2*x^2+1)^(1/2)/a/c^3/(-a^2*c*x^2+c)^(1/2)-8/15*I*polylog(2,-(I*a
*x+(-a^2*x^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c^3/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 390, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.455, Rules used = {4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 198}

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{7/2}}\,dx = -\frac{8i\sqrt{1-a^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{15ac^3\sqrt{c-a^2cx^2}} + \frac{8x\arcsin(ax)^2}{15c^3\sqrt{c-a^2cx^2}} - \frac{8i\sqrt{1-a^2x^2}\arcsin(ax)^2}{15ac^3\sqrt{c-a^2cx^2}} - \frac{4\arcsin(ax)}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)}{10ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} + \frac{16\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{15ac^3\sqrt{c-a^2cx^2}} + \frac{4x\arcsin(ax)^2}{15c^2(c-a^2cx^2)^{3/2}} + \frac{x\arcsin(ax)^2}{5c(c-a^2cx^2)^{5/2}} + \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3(1-a^2x^2)\sqrt{c-a^2cx^2}}$$

```
[In] Int[ArcSin[a*x]^2/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] x/(3*c^3*Sqrt[c - a^2*c*x^2]) + x/(30*c^3*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2]
) - ArcSin[a*x]/(10*a*c^3*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]) - (4*Arc
Sin[a*x])/(15*a*c^3*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x]
^2)/(5*c*(c - a^2*c*x^2)^(5/2)) + (4*x*ArcSin[a*x]^2)/(15*c^2*(c - a^2*c*x^
2)^(3/2)) + (8*x*ArcSin[a*x]^2)/(15*c^3*Sqrt[c - a^2*c*x^2]) - (((8*I)/15)*
Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(a*c^3*Sqrt[c - a^2*c*x^2]) + (16*Sqrt[1 -
 a^2*x^2]*ArcSin[a*x]*Log[1 + E^((2*I)*ArcSin[a*x])])/(15*a*c^3*Sqrt[c - a^
2*c*x^2]) - (((8*I)/15)*Sqrt[1 - a^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[a*x])
])/(a*c^3*Sqrt[c - a^2*c*x^2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{x\arcsin(ax)^2}{5c\left(c-a^2cx^2\right)^{5/2}}+\frac{4\int\frac{\arcsin(ax)^2}{\left(c-a^2cx^2\right)^{5/2}}\,dx}{5c}-\frac{\left(2a\sqrt{1-a^2x^2}\right)\int\frac{x\arcsin(ax)}{\left(1-a^2x^2\right)^3}\,dx}{5c^3\sqrt{c-a^2cx^2}}\\
&=-\frac{\arcsin(ax)}{10ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}}+\frac{x\arcsin(ax)^2}{5c\left(c-a^2cx^2\right)^{5/2}}+\frac{4x\arcsin(ax)^2}{15c^2\left(c-a^2cx^2\right)^{3/2}}\\
&\quad+\frac{8\int\frac{\arcsin(ax)^2}{\left(c-a^2cx^2\right)^{3/2}}\,dx}{15c^2}+\frac{\sqrt{1-a^2x^2}\int\frac{1}{\left(1-a^2x^2\right)^{5/2}}\,dx}{10c^3\sqrt{c-a^2cx^2}}-\frac{\left(8a\sqrt{1-a^2x^2}\right)\int\frac{x\arcsin(ax)}{\left(1-a^2x^2\right)^2}\,dx}{15c^3\sqrt{c-a^2cx^2}}\\
&=\frac{x}{30c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}}-\frac{\arcsin(ax)}{10ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}}\\
&\quad-\frac{4\arcsin(ax)}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}+\frac{x\arcsin(ax)^2}{5c\left(c-a^2cx^2\right)^{5/2}}\\
&\quad+\frac{4x\arcsin(ax)^2}{15c^2\left(c-a^2cx^2\right)^{3/2}}+\frac{8x\arcsin(ax)^2}{15c^3\sqrt{c-a^2cx^2}}+\frac{\sqrt{1-a^2x^2}\int\frac{1}{\left(1-a^2x^2\right)^{3/2}}\,dx}{15c^3\sqrt{c-a^2cx^2}}\\
&\quad+\frac{\left(4\sqrt{1-a^2x^2}\right)\int\frac{1}{\left(1-a^2x^2\right)^{3/2}}\,dx}{15c^3\sqrt{c-a^2cx^2}}-\frac{\left(16a\sqrt{1-a^2x^2}\right)\int\frac{x\arcsin(ax)}{1-a^2x^2}\,dx}{15c^3\sqrt{c-a^2cx^2}}\\
&=\frac{x}{3c^3\sqrt{c-a^2cx^2}}+\frac{x}{30c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}}-\frac{\arcsin(ax)}{10ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}}\\
&\quad-\frac{4\arcsin(ax)}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}+\frac{x\arcsin(ax)^2}{5c\left(c-a^2cx^2\right)^{5/2}}+\frac{4x\arcsin(ax)^2}{15c^2\left(c-a^2cx^2\right)^{3/2}}\\
&\quad+\frac{8x\arcsin(ax)^2}{15c^3\sqrt{c-a^2cx^2}}-\frac{\left(16\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int x\tan(x)\,dx,x,\arcsin(ax)\right)}{15ac^3\sqrt{c-a^2cx^2}}\\
&=\frac{x}{3c^3\sqrt{c-a^2cx^2}}+\frac{x}{30c^3\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}}-\frac{\arcsin(ax)}{10ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}}\\
&\quad-\frac{4\arcsin(ax)}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}+\frac{x\arcsin(ax)^2}{5c\left(c-a^2cx^2\right)^{5/2}}+\frac{4x\arcsin(ax)^2}{15c^2\left(c-a^2cx^2\right)^{3/2}}\\
&\quad+\frac{8x\arcsin(ax)^2}{15c^3\sqrt{c-a^2cx^2}}-\frac{8i\sqrt{1-a^2x^2}\arcsin(ax)^2}{15ac^3\sqrt{c-a^2cx^2}}+\frac{\left(32i\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int\frac{e^{2ix}x}{1+e^{2ix}}\,dx,x,\arcsin(ax)\right)}{15ac^3\sqrt{c-a^2cx^2}}
\end{aligned}
$$

$$= \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)}{10ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{4\arcsin(ax)}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^2}{5c(c-a^2cx^2)^{5/2}} + \frac{4x\arcsin(ax)^2}{15c^2(c-a^2cx^2)^{3/2}} + \frac{8x\arcsin(ax)^2}{15c^3\sqrt{c-a^2cx^2}} - \frac{8i\sqrt{1-a^2x^2}\arcsin(ax)^2}{15ac^3\sqrt{c-a^2cx^2}} + \frac{16\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{15ac^3\sqrt{c-a^2cx^2}} - \frac{\left(16\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(ax)\right)}{15ac^3\sqrt{c-a^2cx^2}}$$

$$= \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)}{10ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{4\arcsin(ax)}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^2}{5c(c-a^2cx^2)^{5/2}} + \frac{4x\arcsin(ax)^2}{15c^2(c-a^2cx^2)^{3/2}} + \frac{8x\arcsin(ax)^2}{15c^3\sqrt{c-a^2cx^2}} - \frac{8i\sqrt{1-a^2x^2}\arcsin(ax)^2}{15ac^3\sqrt{c-a^2cx^2}} + \frac{16\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{15ac^3\sqrt{c-a^2cx^2}} + \frac{\left(8i\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(ax)}\right)}{15ac^3\sqrt{c-a^2cx^2}}$$

$$= \frac{x}{3c^3\sqrt{c-a^2cx^2}} + \frac{x}{30c^3(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)}{10ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{4\arcsin(ax)}{15ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^2}{5c(c-a^2cx^2)^{5/2}} + \frac{4x\arcsin(ax)^2}{15c^2(c-a^2cx^2)^{3/2}} + \frac{8x\arcsin(ax)^2}{15c^3\sqrt{c-a^2cx^2}} - \frac{8i\sqrt{1-a^2x^2}\arcsin(ax)^2}{15ac^3\sqrt{c-a^2cx^2}} + \frac{16\sqrt{1-a^2x^2}\arcsin(ax)\log\left(1+e^{2i\arcsin(ax)}\right)}{15ac^3\sqrt{c-a^2cx^2}} - \frac{8i\sqrt{1-a^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{15ac^3\sqrt{c-a^2cx^2}}$$

Mathematica [A] (verified)

Time = 0.70 (sec) , antiderivative size = 234, normalized size of antiderivative = 0.60

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{7/2}}\,dx = \frac{\sqrt{1-a^2x^2}\left(\frac{a^3x^3}{(1-a^2x^2)^{3/2}}+\frac{11ax}{\sqrt{1-a^2x^2}}-16i\arcsin(ax)^2+\frac{16ax\arcsin(ax)^2}{\sqrt{1-a^2x^2}}+\frac{8\arcsin(ax)\left(-1+\frac{a}{}\right.}{1-a^2x^2}\right.}{}$$

```
[In] Integrate[ArcSin[a*x]^2/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] (Sqrt[1 - a^2*x^2]*((a^3*x^3)/(1 - a^2*x^2)^(3/2) + (11*a*x)/Sqrt[1 - a^2*x
^2] - (16*I)*ArcSin[a*x]^2 + (16*a*x*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2] + (8*
ArcSin[a*x]*(-1 + (a*x*ArcSin[a*x])/Sqrt[1 - a^2*x^2]))/(1 - a^2*x^2) + (3*
ArcSin[a*x]*(-1 + (2*a*x*ArcSin[a*x])/Sqrt[1 - a^2*x^2]))/(1 - a^2*x^2)^2 +
 32*ArcSin[a*x]*Log[1 + E^((2*I)*ArcSin[a*x])] - (16*I)*PolyLog[2, -E^((2*I
)*ArcSin[a*x])]))/(30*a*c^3*Sqrt[c*(1 - a^2*x^2)])
```

Maple [A] (verified)

Time = 0.23 (sec) , antiderivative size = 556, normalized size of antiderivative = 1.43

method	result
default	$-\frac{\sqrt{-c(a^2x^2-1)}\left(8a^5x^5-20a^3x^3+8i\sqrt{-a^2x^2+1}\,a^4x^4+15ax-16i\sqrt{-a^2x^2+1}\,a^2x^2+8i\sqrt{-a^2x^2+1}\right)\left(-156i\sqrt{-a^2x^2+1}\,a^3x^3+64\,\mathrm{ar}\right.}{}$

```
[In] int(arcsin(a*x)^2/(-a^2*c*x^2+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/30*(-c*(a^2*x^2-1))^(1/2)*(8*a^5*x^5-20*a^3*x^3+8*I*(-a^2*x^2+1)^(1/2)*a
^4*x^4+15*a*x-16*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+8*I*(-a^2*x^2+1)^(1/2))*(-156
*I*(-a^2*x^2+1)^(1/2)*a^3*x^3+64*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a^7*x^7+456
*I*arcsin(a*x)*a^4*x^4+32*a^8*x^8+126*I*(-a^2*x^2+1)^(1/2)*a^5*x^5-248*arcs
in(a*x)*(-a^2*x^2+1)^(1/2)*a^5*x^5+64*I*arcsin(a*x)*a^8*x^8-142*a^6*x^6+80*
a^4*x^4*arcsin(a*x)^2+88*I*arcsin(a*x)+340*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a
^3*x^3-280*I*arcsin(a*x)*a^6*x^6+265*a^4*x^4-190*arcsin(a*x)^2*a^2*x^2-328*
I*arcsin(a*x)*a^2*x^2-165*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a*x+62*I*(-a^2*x^2
+1)^(1/2)*a*x-235*a^2*x^2+128*arcsin(a*x)^2-32*I*(-a^2*x^2+1)^(1/2)*a^7*x^7
+80)/c^4/(40*a^10*x^10-215*a^8*x^8+469*a^6*x^6-517*a^4*x^4+287*a^2*x^2-64)/
a+8/15*I*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)*(2*I*arcsin(a*x)*ln(1+(I
*a*x+(-a^2*x^2+1)^(1/2))^2)+2*arcsin(a*x)^2+polylog(2,-(I*a*x+(-a^2*x^2+1)^
(1/2))^2))/c^4/(a^2*x^2-1)/a
```

Fricas [F]

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{7/2}}\,dx=\int \frac{\arcsin\left(ax\right)^2}{(-a^2cx^2+c)^{\frac{7}{2}}}\,dx$$

[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(7/2),x, algorithm="fricas")

[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^2/(a^8*c^4*x^8 - 4*a^6*c^4*x^6 + 6*a^4*c^4*x^4 - 4*a^2*c^4*x^2 + c^4), x)

Sympy [F]

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{7/2}}\,dx=\int \frac{\operatorname{asin}^2\left(ax\right)}{\left(-c\left(ax-1\right)\left(ax+1\right)\right)^{\frac{7}{2}}}\,dx$$

[In] integrate(asin(a*x)**2/(-a**2*c*x**2+c)**(7/2),x)

[Out] Integral(asin(a*x)**2/(-c*(a*x - 1)*(a*x + 1))**(7/2), x)

Maxima [F]

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{7/2}}\,dx=\int \frac{\arcsin\left(ax\right)^2}{(-a^2cx^2+c)^{\frac{7}{2}}}\,dx$$

[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(7/2),x, algorithm="maxima")

[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(7/2), x)

Giac [F]

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{7/2}}\,dx=\int \frac{\arcsin\left(ax\right)^2}{(-a^2cx^2+c)^{\frac{7}{2}}}\,dx$$

[In] integrate(arcsin(a*x)^2/(-a^2*c*x^2+c)^(7/2),x, algorithm="giac")

[Out] integrate(arcsin(a*x)^2/(-a^2*c*x^2 + c)^(7/2), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^2}{(c-a^2cx^2)^{7/2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^2}{(c-a^2\,c\,x^2)^{7/2}}\,dx$$

```
[In] int(asin(a*x)^2/(c - a^2*c*x^2)^(7/2),x)
[Out] int(asin(a*x)^2/(c - a^2*c*x^2)^(7/2), x)
```

3.276 $\int x^m(d-c^2dx^2)^3 (a+b \arcsin(cx))^2 \, dx$

Optimal result

Integrand size = 27, antiderivative size = 1312

$$\int x^m \left(d-c^2dx^2\right)^3 (a+b\arcsin(cx))^2\,dx$$
$$= \frac{2b^2c^2d^3x^{3+m}}{(3+m)(7+m)^2}+\frac{30b^2c^2d^3x^{3+m}}{(3+m)^2(5+m)(7+m)^2}+\frac{36b^2c^2d^3x^{3+m}}{(3+m)^2(5+m)^2(7+m)}$$
$$+\frac{12b^2c^2d^3x^{3+m}}{(3+m)(5+m)^2(7+m)}+\frac{48b^2c^2d^3x^{3+m}}{(3+m)^3(5+m)(7+m)}+\frac{10b^2c^2d^3x^{3+m}}{(7+m)^2(15+8m+m^2)}$$
$$-\frac{10b^2c^4d^3x^{5+m}}{(5+m)^2(7+m)^2}-\frac{4b^2c^4d^3x^{5+m}}{(5+m)(7+m)^2}-\frac{12b^2c^4d^3x^{5+m}}{(5+m)^3(7+m)}+\frac{2b^2c^6d^3x^{7+m}}{(7+m)^3}$$
$$-\frac{36bcd^3x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)(5+m)^2(7+m)}-\frac{48bcd^3x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)^2(5+m)(7+m)}$$
$$-\frac{30bcd^3x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(7+m)^2(15+8m+m^2)}-\frac{10bcd^3x^{2+m}(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{(5+m)(7+m)^2}$$
$$-\frac{12bcd^3x^{2+m}(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{(5+m)^2(7+m)}$$
$$-\frac{2bcd^3x^{2+m}(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{(7+m)^2}$$
$$+\frac{48d^3x^{1+m}(a+b\arcsin(cx))^2}{(5+m)(7+m)(3+4m+m^2)}+\frac{24d^3x^{1+m}(1-c^2x^2)(a+b\arcsin(cx))^2}{(7+m)(15+8m+m^2)}$$
$$+\frac{6d^3x^{1+m}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{(5+m)(7+m)}+\frac{d^3x^{1+m}(1-c^2x^2)^3(a+b\arcsin(cx))^2}{7+m}$$
$$-\frac{48bcd^3x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(2+m)(3+m)^2(5+m)(7+m)}$$
$$-\frac{30bcd^3x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(5+m)(7+m)^2(6+5m+m^2)}$$
$$-\frac{36bcd^3x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(5+m)^2(7+m)(6+5m+m^2)}$$
$$-\frac{96bcd^3x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(5+m)(7+m)(6+11m+6m^2+m^3)}$$
$$+\frac{30b^2c^2d^3x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(2+m)(3+m)^2(5+m)(7+m)^2}$$
$$+\frac{36b^2c^2d^3x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(2+m)(3+m)^2(5+m)^2(7+m)}$$
$$+\frac{48b^2c^2d^3x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(2+m)(3+m)^3(5+m)(7+m)}$$
$$+\frac{96b^2c^2d^3x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(3+m)^2(5+m)(7+m)(2+3m+m^2)}$$

```
[Out] -30*b*c*d^3*x^(2+m)*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/(7+m)^2/(m^2+8*m+1
5)-10*b*c*d^3*x^(2+m)*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(5+m)/(7+m)^2-12
*b*c*d^3*x^(2+m)*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(5+m)^2/(7+m)+30*b^2*
c^2*d^3*x^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m],c^
2*x^2)/(3+m)^2/(7+m)^2/(m^2+7*m+10)+48*b^2*c^2*d^3*x^(3+m)*hypergeom([1, 3/
2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m],c^2*x^2)/(3+m)^3/(7+m)/(m^2+7*m+10
)+2*b^2*c^2*d^3*x^(3+m)/(3+m)/(7+m)^2+36*b^2*c^2*d^3*x^(3+m)/(7+m)/(m^2+8*m
+15)^2+10*b^2*c^2*d^3*x^(3+m)/(7+m)^2/(m^2+8*m+15)-10*b^2*c^4*d^3*x^(5+m)/(
5+m)^2/(7+m)^2-4*b^2*c^4*d^3*x^(5+m)/(5+m)/(7+m)^2-12*b^2*c^4*d^3*x^(5+m)/(
5+m)^3/(7+m)+30*b^2*c^2*d^3*x^(3+m)/(3+m)^2/(5+m)/(7+m)^2+12*b^2*c^2*d^3*x^
(3+m)/(3+m)/(5+m)^2/(7+m)+48*b^2*c^2*d^3*x^(3+m)/(3+m)^3/(5+m)/(7+m)-2*b*c*
d^3*x^(2+m)*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))/(7+m)^2+36*b^2*c^2*d^3*x^(
3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m],c^2*x^2)/(m^2
+8*m+15)^2/(m^2+9*m+14)+2*b^2*c^6*d^3*x^(7+m)/(7+m)^3-36*b*c*d^3*x^(2+m)*(a
+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/(3+m)/(5+m)^2/(7+m)-48*b*c*d^3*x^(2+m)*(
a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/(3+m)^2/(5+m)/(7+m)-30*b*c*d^3*x^(2+m)*
(a+b*arcsin(c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(5+m)/(7+m)^2
/(m^2+5*m+6)-36*b*c*d^3*x^(2+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1+1/2*m],
[2+1/2*m],c^2*x^2)/(5+m)^2/(7+m)/(m^2+5*m+6)-48*b*c*d^3*x^(2+m)*(a+b*arcsin
(c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(3+m)^2/(7+m)/(m^2+7*m+1
0)-96*b*c*d^3*x^(2+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],
c^2*x^2)/(5+m)/(7+m)/(m^3+6*m^2+11*m+6)+96*b^2*c^2*d^3*x^(3+m)*hypergeom([1
, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m],c^2*x^2)/(3+m)^2/(5+m)/(7+m)/(
m^2+3*m+2)+d^3*x^(1+m)*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2/(7+m)+48*d^3*x^(1
+m)*(a+b*arcsin(c*x))^2/(5+m)/(7+m)/(m^2+4*m+3)+24*d^3*x^(1+m)*(-c^2*x^2+1)
*(a+b*arcsin(c*x))^2/(7+m)/(m^2+8*m+15)+6*d^3*x^(1+m)*(-c^2*x^2+1)^2*(a+b*a
rcsin(c*x))^2/(5+m)/(7+m)
```

Rubi [A] (verified)

Time = 1.10 (sec) , antiderivative size = 1312, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$, Rules used

$= \{4787, 4723, 4805, 4783, 30, 14, 276\}$

$$\int x^m\left(d-c^2dx^2\right)^3(a+b\arcsin(cx))^2\,dx$$

$$= \frac{d^3(1-c^2x^2)^3(a+b\arcsin(cx))^2x^{m+1}}{m+7}+\frac{6d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2x^{m+1}}{(m+5)(m+7)}$$
$$+\frac{24d^3(1-c^2x^2)(a+b\arcsin(cx))^2x^{m+1}}{(m+7)(m^2+8m+15)}+\frac{48d^3(a+b\arcsin(cx))^2x^{m+1}}{(m+5)(m+7)(m^2+4m+3)}$$
$$-\frac{2bcd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))x^{m+2}}{(m+7)^2}$$
$$-\frac{12bcd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))x^{m+2}}{(m+5)^2(m+7)}$$
$$-\frac{10bcd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))x^{m+2}}{(m+5)(m+7)^2}-\frac{48bcd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^{m+2}}{(m+3)^2(m+5)(m+7)}$$
$$-\frac{36bcd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^{m+2}}{(m+3)(m+5)^2(m+7)}-\frac{30bcd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^{m+2}}{(m+7)^2(m^2+8m+15)}$$
$$-\frac{48bcd^3(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)x^{m+2}}{(m+2)(m+3)^2(m+5)(m+7)}$$
$$-\frac{36bcd^3(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)x^{m+2}}{(m+5)^2(m+7)(m^2+5m+6)}$$
$$-\frac{30bcd^3(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)x^{m+2}}{(m+5)(m+7)^2(m^2+5m+6)}$$
$$-\frac{96bcd^3(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)x^{m+2}}{(m+5)(m+7)(m^3+6m^2+11m+6)}$$
$$+\frac{48b^2c^2d^3\,{}_3F_2\left(1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2};c^2x^2\right)x^{m+3}}{(m+2)(m+3)^3(m+5)(m+7)}$$
$$+\frac{36b^2c^2d^3\,{}_3F_2\left(1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2};c^2x^2\right)x^{m+3}}{(m+2)(m+3)^2(m+5)^2(m+7)}$$
$$+\frac{96b^2c^2d^3\,{}_3F_2\left(1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2};c^2x^2\right)x^{m+3}}{(m+3)^2(m+5)(m+7)(m^2+3m+2)}$$
$$+\frac{30b^2c^2d^3\,{}_3F_2\left(1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2};c^2x^2\right)x^{m+3}}{(m+2)(m+3)^2(m+5)(m+7)^2}$$
$$+\frac{48b^2c^2d^3x^{m+3}}{(m+3)^3(m+5)(m+7)}+\frac{12b^2c^2d^3x^{m+3}}{(m+3)(m+5)^2(m+7)}+\frac{36b^2c^2d^3x^{m+3}}{(m+3)^2(m+5)^2(m+7)}$$
$$+\frac{10b^2c^2d^3x^{m+3}}{(m+7)^2(m^2+8m+15)}+\frac{2b^2c^2d^3x^{m+3}}{(m+3)(m+7)^2}+\frac{30b^2c^2d^3x^{m+3}}{(m+3)^2(m+5)(m+7)^2}$$
$$-\frac{12b^2c^4d^3x^{m+5}}{(m+5)^3(m+7)}-\frac{4b^2c^4d^3x^{m+5}}{(m+5)(m+7)^2}-\frac{10b^2c^4d^3x^{m+5}}{(m+5)^2(m+7)^2}+\frac{2b^2c^6d^3x^{m+7}}{(m+7)^3}$$

```
[In] Int[x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (2*b^2*c^2*d^3*x^(3 + m))/((3 + m)*(7 + m)^2) + (30*b^2*c^2*d^3*x^(3 + m))/
((3 + m)^2*(5 + m)*(7 + m)^2) + (36*b^2*c^2*d^3*x^(3 + m))/((3 + m)^2*(5 +
m)^2*(7 + m)) + (12*b^2*c^2*d^3*x^(3 + m))/((3 + m)*(5 + m)^2*(7 + m)) + (4
8*b^2*c^2*d^3*x^(3 + m))/((3 + m)^3*(5 + m)*(7 + m)) + (10*b^2*c^2*d^3*x^(3
 + m))/((7 + m)^2*(15 + 8*m + m^2)) - (10*b^2*c^4*d^3*x^(5 + m))/((5 + m)^2
*(7 + m)^2) - (4*b^2*c^4*d^3*x^(5 + m))/((5 + m)*(7 + m)^2) - (12*b^2*c^4*d
^3*x^(5 + m))/((5 + m)^3*(7 + m)) + (2*b^2*c^6*d^3*x^(7 + m))/(7 + m)^3 - (
36*b*c*d^3*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/((3 + m)*(5 + m
)^2*(7 + m)) - (48*b*c*d^3*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))
/((3 + m)^2*(5 + m)*(7 + m)) - (30*b*c*d^3*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a +
 b*ArcSin[c*x]))/((7 + m)^2*(15 + 8*m + m^2)) - (10*b*c*d^3*x^(2 + m)*(1 -
c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/((5 + m)*(7 + m)^2) - (12*b*c*d^3*x^(2
+ m)*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/((5 + m)^2*(7 + m)) - (2*b*c*
d^3*x^(2 + m)*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(7 + m)^2 + (48*d^3*
x^(1 + m)*(a + b*ArcSin[c*x])^2)/((5 + m)*(7 + m)*(3 + 4*m + m^2)) + (24*d^
3*x^(1 + m)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((7 + m)*(15 + 8*m + m^2))
 + (6*d^3*x^(1 + m)*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/((5 + m)*(7 + m)
) + (d^3*x^(1 + m)*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/(7 + m) - (48*b*c
*d^3*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m
)/2, c^2*x^2])/((2 + m)*(3 + m)^2*(5 + m)*(7 + m)) - (30*b*c*d^3*x^(2 + m)*
(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/
((5 + m)*(7 + m)^2*(6 + 5*m + m^2)) - (36*b*c*d^3*x^(2 + m)*(a + b*ArcSin[c
*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/((5 + m)^2*(7 +
 m)*(6 + 5*m + m^2)) - (96*b*c*d^3*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeome
tric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/((5 + m)*(7 + m)*(6 + 11*m + 6
*m^2 + m^3)) + (30*b^2*c^2*d^3*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3
/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^2*(5 + m)*(7 +
m)^2) + (36*b^2*c^2*d^3*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/
2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^2*(5 + m)^2*(7 + m)) +
 (48*b^2*c^2*d^3*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2
+ m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^3*(5 + m)*(7 + m)) + (96*b^2*
c^2*d^3*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/
2 + m/2}, c^2*x^2])/((3 + m)^2*(5 + m)*(7 + m)*(2 + 3*m + m^2))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\text{integral} = \frac{d^3x^{1+m}(1-c^2x^2)^3(a+b\arcsin(cx))^2}{7+m} + \frac{(6d)\int x^m(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx}{7+m} - \frac{(2bcd^3)\int x^{1+m}(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\,dx}{7+m}$$

$$= -\frac{2bcd^3x^{2+m}(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{(7+m)^2} + \frac{6d^3x^{1+m}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{(5+m)(7+m)} + \frac{d^3x^{1+m}(1-c^2x^2)^3(a+b\arcsin(cx))^2}{7+m} - \frac{(10bcd^3)\int x^{1+m}(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{(7+m)^2} + \frac{(2b^2c^2d^3)\int x^{2+m}(1-c^2x^2)^2\,dx}{(7+m)^2} + \frac{(24d^2)\int x^m(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx}{(5+m)(7+m)} - \frac{(12bcd^3)\int x^{1+m}(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{(5+m)(7+m)}$$

$$
\begin{aligned}
&= -\frac{10bcd^3x^{2+m}(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{(5+m)(7+m)^2} \\
&\quad - \frac{12bcd^3x^{2+m}(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{(5+m)^2(7+m)} \\
&\quad - \frac{2bcd^3x^{2+m}(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}{(7+m)^2} \\
&\quad + \frac{24d^3x^{1+m}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(3+m)(5+m)(7+m)} \\
&\quad + \frac{6d^3x^{1+m}(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{(5+m)(7+m)} + \frac{d^3x^{1+m}(1-c^2x^2)^3\,(a+b\arcsin(cx))^2}{7+m} \\
&\quad + \frac{(2b^2c^2d^3)\int\left(x^{2+m}-2c^2x^{4+m}+c^4x^{6+m}\right)\,dx}{(7+m)^2} \\
&\quad - \frac{(30bcd^3)\int x^{1+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{(5+m)(7+m)^2} \\
&\quad + \frac{(10b^2c^2d^3)\int x^{2+m}(1-c^2x^2)\,dx}{(5+m)(7+m)^2} \\
&\quad - \frac{(36bcd^3)\int x^{1+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{(5+m)^2(7+m)} \\
&\quad + \frac{(12b^2c^2d^3)\int x^{2+m}(1-c^2x^2)\,dx}{(5+m)^2(7+m)} + \frac{(48d^3)\int x^m(a+b\arcsin(cx))^2\,dx}{(3+m)(5+m)(7+m)} \\
&\quad - \frac{(48bcd^3)\int x^{1+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{(3+m)(5+m)(7+m)}
\end{aligned}
$$

$$= \frac{2b^2c^2d^3x^{3+m}}{(3+m)(7+m)^2} - \frac{4b^2c^4d^3x^{5+m}}{(5+m)(7+m)^2} + \frac{2b^2c^6d^3x^{7+m}}{(7+m)^3}$$
$$- \frac{30bcd^3x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)(5+m)(7+m)^2}$$
$$- \frac{36bcd^3x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)(5+m)^2(7+m)}$$
$$- \frac{48bcd^3x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)^2(5+m)(7+m)}$$
$$- \frac{10bcd^3x^{2+m}(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{(5+m)(7+m)^2}$$
$$- \frac{12bcd^3x^{2+m}(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{(5+m)^2(7+m)}$$
$$- \frac{2bcd^3x^{2+m}(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{(7+m)^2} + \frac{48d^3x^{1+m}(a+b\arcsin(cx))^2}{(1+m)(3+m)(5+m)(7+m)}$$
$$+ \frac{24d^3x^{1+m}(1-c^2x^2)(a+b\arcsin(cx))^2}{(3+m)(5+m)(7+m)} + \frac{6d^3x^{1+m}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{(5+m)(7+m)}$$
$$+ \frac{d^3x^{1+m}(1-c^2x^2)^3(a+b\arcsin(cx))^2}{7+m} + \frac{(10b^2c^2d^3)\int(x^{2+m}-c^2x^{4+m})\,dx}{(5+m)(7+m)^2}$$
$$- \frac{(30bcd^3)\int\frac{x^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{(3+m)(5+m)(7+m)^2} + \frac{(30b^2c^2d^3)\int x^{2+m}\,dx}{(3+m)(5+m)(7+m)^2}$$
$$+ \frac{(12b^2c^2d^3)\int(x^{2+m}-c^2x^{4+m})\,dx}{(5+m)^2(7+m)} - \frac{(36bcd^3)\int\frac{x^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{(3+m)(5+m)^2(7+m)}$$
$$+ \frac{(36b^2c^2d^3)\int x^{2+m}\,dx}{(3+m)(5+m)^2(7+m)} - \frac{(48bcd^3)\int\frac{x^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{(3+m)^2(5+m)(7+m)}$$
$$+ \frac{(48b^2c^2d^3)\int x^{2+m}\,dx}{(3+m)^2(5+m)(7+m)} - \frac{(96bcd^3)\int\frac{x^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{(1+m)(3+m)(5+m)(7+m)}$$

$$
\begin{aligned}
&= \frac{2b^2c^2d^3x^{3+m}}{(3+m)(7+m)^2} + \frac{30b^2c^2d^3x^{3+m}}{(3+m)^2(5+m)(7+m)^2} + \frac{10b^2c^2d^3x^{3+m}}{(3+m)(5+m)(7+m)^2} \\
&+ \frac{36b^2c^2d^3x^{3+m}}{(3+m)^2(5+m)^2(7+m)} + \frac{12b^2c^2d^3x^{3+m}}{(3+m)(5+m)^2(7+m)} \\
&+ \frac{48b^2c^2d^3x^{3+m}}{(3+m)^3(5+m)(7+m)} - \frac{10b^2c^4d^3x^{5+m}}{(5+m)^2(7+m)^2} - \frac{4b^2c^4d^3x^{5+m}}{(5+m)(7+m)^2} \\
&- \frac{12b^2c^4d^3x^{5+m}}{(5+m)^3(7+m)} + \frac{2b^2c^6d^3x^{7+m}}{(7+m)^3} - \frac{30bcd^3x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)(5+m)(7+m)^2} \\
&- \frac{36bcd^3x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)(5+m)^2(7+m)} \\
&- \frac{48bcd^3x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)^2(5+m)(7+m)} \\
&- \frac{10bcd^3x^{2+m}(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{(5+m)(7+m)^2} \\
&- \frac{12bcd^3x^{2+m}(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{(5+m)^2(7+m)} \\
&- \frac{2bcd^3x^{2+m}(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{(7+m)^2} \\
&+ \frac{48d^3x^{1+m}(a+b\arcsin(cx))^2}{(1+m)(3+m)(5+m)(7+m)} + \frac{24d^3x^{1+m}(1-c^2x^2)(a+b\arcsin(cx))^2}{(3+m)(5+m)(7+m)} \\
&+ \frac{6d^3x^{1+m}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{(5+m)(7+m)} + \frac{d^3x^{1+m}(1-c^2x^2)^3(a+b\arcsin(cx))^2}{7+m} \\
&- \frac{30bcd^3x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(2+m)(3+m)(5+m)(7+m)^2} \\
&- \frac{36bcd^3x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(2+m)(3+m)(5+m)^2(7+m)} \\
&- \frac{48bcd^3x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(2+m)(3+m)^2(5+m)(7+m)} \\
&- \frac{96bcd^3x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(1+m)(2+m)(3+m)(5+m)(7+m)} \\
&+ \frac{30b^2c^2d^3x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(2+m)(3+m)^2(5+m)(7+m)^2} \\
&+ \frac{36b^2c^2d^3x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(2+m)(3+m)^2(5+m)^2(7+m)} \\
&+ \frac{48b^2c^2d^3x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(2+m)(3+m)^3(5+m)(7+m)} \\
&+ \frac{96b^2c^2d^3x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(1+m)(2+m)(3+m)^2(5+m)(7+m)}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.80 (sec) , antiderivative size = 539, normalized size of antiderivative = 0.41

$$\int x^m \left(d-c^2 d x^2\right)^3 (a+b \arcsin(cx))^2 \, dx = d^3 x^{1+m} \left(\frac{(a+b \arcsin(cx))^2}{1+m} - \frac{3c^2x^2(a+b\arcsin(cx))^2}{3+m} + \frac{3c^4x^4(a+b\arcsin(cx))^2}{5+m} - \frac{c^6x^6(a+b\arcsin(cx))^2}{7+m} + \frac{2bcx\left(-\left((3+m)(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)\right)+bcx\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};\right.\right.}{(1+m)(2+m)(3+m)} - \frac{6bc^3x^3\left(-\left((5+m)(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{4+m}{2},\frac{6+m}{2},c^2x^2\right)\right)+bcx\,{}_3F_2\left(1,\frac{5}{2}+\frac{m}{2},\frac{5}{2}+\frac{m}{2}\right.\right.}{(3+m)(4+m)(5+m)} + \frac{6bc^5x^5\left(-\left((7+m)(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{6+m}{2},\frac{8+m}{2},c^2x^2\right)\right)+bcx\,{}_3F_2\left(1,\frac{7}{2}+\frac{m}{2},\frac{7}{2}+\frac{m}{2}\right.\right.}{(5+m)(6+m)(7+m)} - \frac{2bc^7x^7\left(-\left((9+m)(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},4+\frac{m}{2},5+\frac{m}{2},c^2x^2\right)\right)+bcx\,{}_3F_2\left(1,\frac{9}{2}+\frac{m}{2},\frac{9}{2}\right.\right.}{(7+m)(8+m)(9+m)}\right.$$

```
[In] Integrate[x^m*(d - c^2*d*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] d^3*x^(1 + m)*((a + b*ArcSin[c*x])^2/(1 + m) - (3*c^2*x^2*(a + b*ArcSin[c*x
])^2)/(3 + m) + (3*c^4*x^4*(a + b*ArcSin[c*x])^2)/(5 + m) - (c^6*x^6*(a + b
*ArcSin[c*x])^2)/(7 + m) + (2*b*c*x*(-((3 + m)*(a + b*ArcSin[c*x])*Hypergeo
metric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2]) + b*c*x*HypergeometricPFQ[{1
, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2]))/((1 + m)*(2 + m)*
(3 + m)) - (6*b*c^3*x^3*(-((5 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/
2, (4 + m)/2, (6 + m)/2, c^2*x^2]) + b*c*x*HypergeometricPFQ[{1, 5/2 + m/2,
 5/2 + m/2}, {3 + m/2, 7/2 + m/2}, c^2*x^2]))/((3 + m)*(4 + m)*(5 + m)) + (
6*b*c^5*x^5*(-((7 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (6 + m)/2
, (8 + m)/2, c^2*x^2]) + b*c*x*HypergeometricPFQ[{1, 7/2 + m/2, 7/2 + m/2},
 {4 + m/2, 9/2 + m/2}, c^2*x^2]))/((5 + m)*(6 + m)*(7 + m)) - (2*b*c^7*x^7*
(-((9 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, 4 + m/2, 5 + m/2, c^2
*x^2]) + b*c*x*HypergeometricPFQ[{1, 9/2 + m/2, 9/2 + m/2}, {5 + m/2, 11/2
+ m/2}, c^2*x^2]))/((7 + m)*(8 + m)*(9 + m)))
```

Maple [F]

$$\int x^m \left(-c^2 d\, x^2+d\right)^3 (a+b \arcsin(cx))^2 \, dx$$

```
[In] int(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x)
```

Fricas [F]

$$\int x^m \left(d-c^2 d x^2\right)^3 (a+b \arcsin(cx))^2 \, dx = \int -\left(c^2 d x^2-d\right)^3 (b \arcsin(cx)+a)^2 x^m \, dx$$

[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")

[Out] integral(-(a^2*c^6*d^3*x^6 - 3*a^2*c^4*d^3*x^4 + 3*a^2*c^2*d^3*x^2 - a^2*d^3 + (b^2*c^6*d^3*x^6 - 3*b^2*c^4*d^3*x^4 + 3*b^2*c^2*d^3*x^2 - b^2*d^3)*arcsin(c*x)^2 + 2*(a*b*c^6*d^3*x^6 - 3*a*b*c^4*d^3*x^4 + 3*a*b*c^2*d^3*x^2 - a*b*d^3)*arcsin(c*x))*x^m, x)

Sympy [F]

$$\begin{aligned}\int x^m \left(d-c^2 d x^2\right)^3 (a+b \arcsin(cx))^2 \, dx \\ = -d^3\Bigg(\int \left(-a^2 x^m\right) dx + \int \left(-b^2 x^m \operatorname{asin}^2(cx)\right) dx + \int \left(-2abx^m \operatorname{asin}(cx)\right) dx \\ + \int 3a^2c^2x^2x^m \, dx + \int \left(-3a^2c^4x^4x^m\right) dx + \int a^2c^6x^6x^m \, dx + \int 3b^2c^2x^2x^m \operatorname{asin}^2(cx) \, dx \\ + \int \left(-3b^2c^4x^4x^m \operatorname{asin}^2(cx)\right) dx + \int b^2c^6x^6x^m \operatorname{asin}^2(cx) \, dx + \int 6abc^2x^2x^m \operatorname{asin}(cx) \, dx \\ + \int \left(-6abc^4x^4x^m \operatorname{asin}(cx)\right) dx + \int 2abc^6x^6x^m \operatorname{asin}(cx) \, dx\Bigg)\end{aligned}$$

[In] integrate(x**m*(-c**2*d*x**2+d)**3*(a+b*asin(c*x))**2,x)

[Out] -d**3*(Integral(-a**2*x**m, x) + Integral(-b**2*x**m*asin(c*x)**2, x) + Integral(-2*a*b*x**m*asin(c*x), x) + Integral(3*a**2*c**2*x**2*x**m, x) + Integral(-3*a**2*c**4*x**4*x**m, x) + Integral(a**2*c**6*x**6*x**m, x) + Integral(3*b**2*c**2*x**2*x**m*asin(c*x)**2, x) + Integral(-3*b**2*c**4*x**4*x**m*asin(c*x)**2, x) + Integral(b**2*c**6*x**6*x**m*asin(c*x)**2, x) + Integral(6*a*b*c**2*x**2*x**m*asin(c*x), x) + Integral(-6*a*b*c**4*x**4*x**m*asin(c*x), x) + Integral(2*a*b*c**6*x**6*x**m*asin(c*x), x))

Maxima [F]

$$\int x^m (d - c^2dx^2)^3 (a + b\arcsin(cx))^2 dx = \int -(c^2dx^2 - d)^3(b\arcsin(cx) + a)^2x^m dx$$

[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")

[Out] -a^2*c^6*d^3*x^(m + 7)/(m + 7) + 3*a^2*c^4*d^3*x^(m + 5)/(m + 5) - 3*a^2*c^2*d^3*x^(m + 3)/(m + 3) + a^2*d^3*x^(m + 1)/(m + 1) - (((b^2*c^6*d^3*m^3 + 9*b^2*c^6*d^3*m^2 + 23*b^2*c^6*d^3*m + 15*b^2*c^6*d^3)*x^7 - 3*(b^2*c^4*d^3*m^3 + 11*b^2*c^4*d^3*m^2 + 31*b^2*c^4*d^3*m + 21*b^2*c^4*d^3)*x^5 + 3*(b^2*c^2*d^3*m^3 + 13*b^2*c^2*d^3*m^2 + 47*b^2*c^2*d^3*m + 35*b^2*c^2*d^3)*x^3 - (b^2*d^3*m^3 + 15*b^2*d^3*m^2 + 71*b^2*d^3*m + 105*b^2*d^3)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + (m^4 + 16*m^3 + 86*m^2 + 176*m + 105)*integrate(-2*(((b^2*c^7*d^3*m^3 + 9*b^2*c^7*d^3*m^2 + 23*b^2*c^7*d^3*m + 15*b^2*c^7*d^3)*x^7 - 3*(b^2*c^5*d^3*m^3 + 11*b^2*c^5*d^3*m^2 + 31*b^2*c^5*d^3*m + 21*b^2*c^5*d^3)*x^5 + 3*(b^2*c^3*d^3*m^3 + 13*b^2*c^3*d^3*m^2 + 47*b^2*c^3*d^3*m + 35*b^2*c^3*d^3)*x^3 - (b^2*c*d^3*m^3 + 15*b^2*c*d^3*m^2 + 71*b^2*c*d^3*m + 105*b^2*c*d^3)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (a*b*d^3*m^4 + (a*b*c^8*d^3*m^4 + 16*a*b*c^8*d^3*m^3 + 86*a*b*c^8*d^3*m^2 + 176*a*b*c^8*d^3*m + 105*a*b*c^8*d^3)*x^8 + 16*a*b*d^3*m^3 + 86*a*b*d^3*m^2 - 4*(a*b*c^6*d^3*m^4 + 16*a*b*c^6*d^3*m^3 + 86*a*b*c^6*d^3*m^2 + 176*a*b*c^6*d^3*m + 105*a*b*c^6*d^3)*x^6 + 176*a*b*d^3*m + 105*a*b*d^3 + 6*(a*b*c^4*d^3*m^4 + 16*a*b*c^4*d^3*m^3 + 86*a*b*c^4*d^3*m^2 + 176*a*b*c^4*d^3*m + 105*a*b*c^4*d^3)*x^4 - 4*(a*b*c^2*d^3*m^4 + 16*a*b*c^2*d^3*m^3 + 86*a*b*c^2*d^3*m^2 + 176*a*b*c^2*d^3*m + 105*a*b*c^2*d^3)*x^2)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(m^4 + 16*m^3 - (c^2*m^4 + 16*c^2*m^3 + 86*c^2*m^2 + 176*c^2*m + 105*c^2)*x^2 + 86*m^2 + 176*m + 105), x))/(m^4 + 16*m^3 + 86*m^2 + 176*m + 105)

Giac [F]

$$\int x^m (d - c^2dx^2)^3 (a + b\arcsin(cx))^2 dx = \int -(c^2dx^2 - d)^3(b\arcsin(cx) + a)^2x^m dx$$

[In] integrate(x^m*(-c^2*d*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")

[Out] integrate(-(c^2*d*x^2 - d)^3*(b*arcsin(c*x) + a)^2*x^m, x)

Mupad [F(-1)]

Timed out.

$$\int x^m (d-c^2dx^2)^3 (a+b\arcsin(cx))^2\,dx = \int x^m\,(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^3\,dx$$

```
[In] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3,x)
[Out] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^3, x)
```

3.277 $\int x^m (d-c^2dx^2)^2 (a+b\arcsin(cx))^2 \, dx$

Optimal result

Integrand size = 27, antiderivative size = 756

$$
\begin{aligned}
&\int x^m (d-c^2dx^2)^2 (a+b\arcsin(cx))^2 \, dx \\
&= \frac{6b^2c^2d^2x^{3+m}}{(3+m)^2(5+m)^2} + \frac{2b^2c^2d^2x^{3+m}}{(3+m)(5+m)^2} + \frac{8b^2c^2d^2x^{3+m}}{(3+m)^3(5+m)} - \frac{2b^2c^4d^2x^{5+m}}{(5+m)^3} \\
&\quad - \frac{6bcd^2x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)(5+m)^2} - \frac{8bcd^2x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)^2(5+m)} \\
&\quad - \frac{2bcd^2x^{2+m}(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{(5+m)^2} + \frac{8d^2x^{1+m}(a+b\arcsin(cx))^2}{(5+m)(3+4m+m^2)} \\
&\quad + \frac{4d^2x^{1+m}(1-c^2x^2)(a+b\arcsin(cx))^2}{15+8m+m^2} + \frac{d^2x^{1+m}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{5+m} \\
&\quad - \frac{8bcd^2x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(2+m)(3+m)^2(5+m)} \\
&\quad - \frac{6bcd^2x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(5+m)^2(6+5m+m^2)} \\
&\quad - \frac{16bcd^2x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(5+m)(6+11m+6m^2+m^3)} \\
&\quad + \frac{6b^2c^2d^2x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(2+m)(3+m)^2(5+m)^2} \\
&\quad + \frac{8b^2c^2d^2x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(2+m)(3+m)^3(5+m)} \\
&\quad + \frac{16b^2c^2d^2x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(3+m)^2(5+m)(2+3m+m^2)}
\end{aligned}
$$

```
[Out] 6*b^2*c^2*d^2*x^(3+m)/(3+m)^2/(5+m)^2+2*b^2*c^2*d^2*x^(3+m)/(3+m)/(5+m)^2+8
*b^2*c^2*d^2*x^(3+m)/(3+m)^3/(5+m)-2*b^2*c^4*d^2*x^(5+m)/(5+m)^3-2*b*c*d^2*
```

```
x^(2+m)*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(5+m)^2+8*d^2*x^(1+m)*(a+b*arc
sin(c*x))^2/(5+m)/(m^2+4*m+3)+4*d^2*x^(1+m)*(-c^2*x^2+1)*(a+b*arcsin(c*x))^
2/(m^2+8*m+15)+d^2*x^(1+m)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/(5+m)-6*b*c*d
^2*x^(2+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(5
+m)^2/(m^2+5*m+6)-8*b*c*d^2*x^(2+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1+1/2
*m],[2+1/2*m],c^2*x^2)/(3+m)^2/(m^2+7*m+10)-16*b*c*d^2*x^(2+m)*(a+b*arcsin(
c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(5+m)/(m^3+6*m^2+11*m+6)+
8*b^2*c^2*d^2*x^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2
*m],c^2*x^2)/(2+m)/(3+m)^3/(5+m)+16*b^2*c^2*d^2*x^(3+m)*hypergeom([1, 3/2+1
/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m],c^2*x^2)/(3+m)^2/(5+m)/(m^2+3*m+2)+6*
b^2*c^2*d^2*x^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m
],c^2*x^2)/(2+m)/(m^2+8*m+15)^2-6*b*c*d^2*x^(2+m)*(a+b*arcsin(c*x))*(-c^2*x
^2+1)^(1/2)/(3+m)/(5+m)^2-8*b*c*d^2*x^(2+m)*(a+b*arcsin(c*x))*(-c^2*x^2+1)^
(1/2)/(3+m)^2/(5+m)
```

Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 756, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used

$= \{4787, 4723, 4805, 4783, 30, 14\}$

$$\int x^m \left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))^2\,dx$$

$$= \frac{16b^2c^2d^2x^{m+3}\,{}_3F_2\left(1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2};c^2x^2\right)}{(m+3)^2(m+5)\left(m^2+3m+2\right)} + \frac{8b^2c^2d^2x^{m+3}\,{}_3F_2\left(1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2};c^2x^2\right)}{(m+2)(m+3)^3(m+5)} + \frac{6b^2c^2d^2x^{m+3}\,{}_3F_2\left(1,\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};\frac{m}{2}+2,\frac{m}{2}+\frac{5}{2};c^2x^2\right)}{(m+2)(m+3)^2(m+5)^2} - \frac{6bcd^2x^{m+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)(a+b\arcsin(cx))}{(m+5)^2\left(m^2+5m+6\right)} - \frac{16bcd^2x^{m+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)(a+b\arcsin(cx))}{(m+5)\left(m^3+6m^2+11m+6\right)} - \frac{8bcd^2x^{m+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)(a+b\arcsin(cx))}{(m+2)(m+3)^2(m+5)} + \frac{4d^2\left(1-c^2x^2\right)x^{m+1}(a+b\arcsin(cx))^2}{m^2+8m+15} + \frac{d^2\left(1-c^2x^2\right)^2x^{m+1}(a+b\arcsin(cx))^2}{m+5} - \frac{2bcd^2\left(1-c^2x^2\right)^{3/2}x^{m+2}(a+b\arcsin(cx))}{(m+5)^2} - \frac{8bcd^2\sqrt{1-c^2x^2}x^{m+2}(a+b\arcsin(cx))}{(m+3)^2(m+5)} - \frac{6bcd^2\sqrt{1-c^2x^2}x^{m+2}(a+b\arcsin(cx))}{(m+3)(m+5)^2} + \frac{8d^2x^{m+1}(a+b\arcsin(cx))^2}{(m+5)\left(m^2+4m+3\right)} - \frac{2b^2c^4d^2x^{m+5}}{(m+5)^3} + \frac{8b^2c^2d^2x^{m+3}}{(m+3)^3(m+5)} + \frac{2b^2c^2d^2x^{m+3}}{(m+3)(m+5)^2} + \frac{6b^2c^2d^2x^{m+3}}{(m+3)^2(m+5)^2}$$

```
[In] Int[x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (6*b^2*c^2*d^2*x^(3 + m))/((3 + m)^2*(5 + m)^2) + (2*b^2*c^2*d^2*x^(3 + m))
/((3 + m)*(5 + m)^2) + (8*b^2*c^2*d^2*x^(3 + m))/((3 + m)^3*(5 + m)) - (2*b
^2*c^4*d^2*x^(5 + m))/(5 + m)^3 - (6*b*c*d^2*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/((3 + m)*(5 + m)^2) - (8*b*c*d^2*x^(2 + m)*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/((3 + m)^2*(5 + m)) - (2*b*c*d^2*x^(2 + m)*(1 - c
^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(5 + m)^2 + (8*d^2*x^(1 + m)*(a + b*ArcS
in[c*x])^2)/((5 + m)*(3 + 4*m + m^2)) + (4*d^2*x^(1 + m)*(1 - c^2*x^2)*(a +
 b*ArcSin[c*x])^2)/(15 + 8*m + m^2) + (d^2*x^(1 + m)*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x])^2)/(5 + m) - (8*b*c*d^2*x^(2 + m)*(a + b*ArcSin[c*x])*Hyperge
ometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/((2 + m)*(3 + m)^2*(5 + m))
 - (6*b*c*d^2*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/
2, (4 + m)/2, c^2*x^2])/((5 + m)^2*(6 + 5*m + m^2)) - (16*b*c*d^2*x^(2 + m)
*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])
/((5 + m)*(6 + 11*m + 6*m^2 + m^3)) + (6*b^2*c^2*d^2*x^(3 + m)*Hypergeometr
icPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(
```

```
3 + m)^2*(5 + m)^2) + (8*b^2*c^2*d^2*x^(3 + m)*HypergeometricPFQ[{1, 3/2 +
m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^3*(5 + m)
) + (16*b^2*c^2*d^2*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2},
{2 + m/2, 5/2 + m/2}, c^2*x^2])/((3 + m)^2*(5 + m)*(2 + 3*m + m^2))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
```

```
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{d^2x^{1+m}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{5+m} \\
&\quad+\frac{(4d)\int x^m(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx}{5+m} \\
&\quad-\frac{(2bcd^2)\int x^{1+m}(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{5+m} \\
&= -\frac{2bcd^2x^{2+m}(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{(5+m)^2} \\
&\quad+\frac{4d^2x^{1+m}(1-c^2x^2)(a+b\arcsin(cx))^2}{15+8m+m^2}+\frac{d^2x^{1+m}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{5+m} \\
&\quad-\frac{(6bcd^2)\int x^{1+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{(5+m)^2} \\
&\quad+\frac{(2b^2c^2d^2)\int x^{2+m}(1-c^2x^2)\,dx}{(5+m)^2}+\frac{(8d^2)\int x^m(a+b\arcsin(cx))^2\,dx}{15+8m+m^2} \\
&\quad-\frac{(8bcd^2)\int x^{1+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{15+8m+m^2} \\
&= -\frac{6bcd^2x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)(5+m)^2}-\frac{8bcd^2x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)^2(5+m)} \\
&\quad-\frac{2bcd^2x^{2+m}(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{(5+m)^2}+\frac{8d^2x^{1+m}(a+b\arcsin(cx))^2}{15+23m+9m^2+m^3} \\
&\quad+\frac{4d^2x^{1+m}(1-c^2x^2)(a+b\arcsin(cx))^2}{15+8m+m^2}+\frac{d^2x^{1+m}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{5+m} \\
&\quad+\frac{(2b^2c^2d^2)\int(x^{2+m}-c^2x^{4+m})\,dx}{(5+m)^2}-\frac{(6bcd^2)\int\frac{x^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{(3+m)(5+m)^2} \\
&\quad+\frac{(6b^2c^2d^2)\int x^{2+m}\,dx}{(3+m)(5+m)^2}-\frac{(8bcd^2)\int\frac{x^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{(3+m)^2(5+m)} \\
&\quad+\frac{(8b^2c^2d^2)\int x^{2+m}\,dx}{(3+m)^2(5+m)}-\frac{(16bcd^2)\int\frac{x^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{15+23m+9m^2+m^3}
\end{aligned}
$$

$$= \frac{6b^2c^2d^2x^{3+m}}{(3+m)^2(5+m)^2} + \frac{2b^2c^2d^2x^{3+m}}{(3+m)(5+m)^2} + \frac{8b^2c^2d^2x^{3+m}}{(3+m)^3(5+m)} - \frac{2b^2c^4d^2x^{5+m}}{(5+m)^3}$$
$$- \frac{6bcd^2x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)(5+m)^2} - \frac{8bcd^2x^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)^2(5+m)}$$
$$- \frac{2bcd^2x^{2+m}(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{(5+m)^2} + \frac{8d^2x^{1+m}(a+b\arcsin(cx))^2}{15+23m+9m^2+m^3}$$
$$+ \frac{4d^2x^{1+m}(1-c^2x^2)(a+b\arcsin(cx))^2}{15+8m+m^2} + \frac{d^2x^{1+m}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{5+m}$$
$$- \frac{6bcd^2x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(2+m)(3+m)(5+m)^2}$$
$$- \frac{8bcd^2x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(2+m)(3+m)^2(5+m)}$$
$$- \frac{16bcd^2x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(2+m)(15+23m+9m^2+m^3)}$$
$$+ \frac{6b^2c^2d^2x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(2+m)(3+m)^2(5+m)^2}$$
$$+ \frac{8b^2c^2d^2x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(2+m)(3+m)^3(5+m)}$$
$$+ \frac{16b^2c^2d^2x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(2+m)(3+m)^2(5+6m+m^2)}$$

Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 403, normalized size of antiderivative = 0.53

$$\int x^m(d-c^2dx^2)^2(a+b\arcsin(cx))^2\,dx$$
$$= d^2x^{1+m}\left(\frac{(a+b\arcsin(cx))^2}{1+m} - \frac{2c^2x^2(a+b\arcsin(cx))^2}{3+m} + \frac{c^4x^4(a+b\arcsin(cx))^2}{5+m}\right.$$
$$+ \frac{2bcx\left(-\left((3+m)(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)\right) + bcx\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2}\right.\right.}{(1+m)(2+m)(3+m)}$$
$$- \frac{4bc^3x^3\left(-\left((5+m)(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{4+m}{2},\frac{6+m}{2},c^2x^2\right)\right) + bcx\,{}_3F_2\left(1,\frac{5}{2}+\frac{m}{2},\frac{5}{2}+\right.\right.}{(3+m)(4+m)(5+m)}$$
$$+ \frac{2bc^5x^5\left(-\left((7+m)(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{6+m}{2},\frac{8+m}{2},c^2x^2\right)\right) + bcx\,{}_3F_2\left(1,\frac{7}{2}+\frac{m}{2},\frac{7}{2}+\right.\right.}{(5+m)(6+m)(7+m)}$$

```
[In] Integrate[x^m*(d - c^2*d*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] d^2*x^(1 + m)*((a + b*ArcSin[c*x])^2/(1 + m) - (2*c^2*x^2*(a + b*ArcSin[c*x
])^2)/(3 + m) + (c^4*x^4*(a + b*ArcSin[c*x])^2)/(5 + m) + (2*b*c*x*(-((3 +
```

```
m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2
]) + b*c*x*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2
}, c^2*x^2]))/((1 + m)*(2 + m)*(3 + m)) - (4*b*c^3*x^3*(-((5 + m)*(a + b*Ar
cSin[c*x])*Hypergeometric2F1[1/2, (4 + m)/2, (6 + m)/2, c^2*x^2]) + b*c*x*H
ypergeometricPFQ[{1, 5/2 + m/2, 5/2 + m/2}, {3 + m/2, 7/2 + m/2}, c^2*x^2])
)/((3 + m)*(4 + m)*(5 + m)) + (2*b*c^5*x^5*(-((7 + m)*(a + b*ArcSin[c*x])*H
ypergeometric2F1[1/2, (6 + m)/2, (8 + m)/2, c^2*x^2]) + b*c*x*Hypergeometri
cPFQ[{1, 7/2 + m/2, 7/2 + m/2}, {4 + m/2, 9/2 + m/2}, c^2*x^2]))/((5 + m)*(
6 + m)*(7 + m)))
```

Maple [F]

$$\int x^{m} \left(-c^{2} d \,x^{2}+d \right)^{2} \left(a +b \arcsin \left(c x \right)\right)^{2}d x$$

```
[In] int(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x)
[Out] int(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x)
```

Fricas [F]

$$\int x^m \left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))^2\,dx = \int \left(c^{2} d x^{2} - d\right)^{2} {\left(b \arcsin\left(c x\right) + a\right)}^{2} x^{m}\,{d x}$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*x^m, x)
```

Sympy [F]

$$\begin{aligned}\int x^m \left(d-c^2dx^2\right)^2 (a+b\arcsin(cx))^2\,dx &= d^{2} \left(\int a^{2} x^{m}\, dx + \int b^{2} x^{m} \operatorname{asin}^{2}{\left(c x \right)}\, dx + \int 2 a b x^{m} \operatorname{asin}{\left(c x \right)}\, dx + \int \left(- 2 a^{2} c^{2} x^{2} x^{m}\right)\, dx \right.\\ &\quad + \int a^{2} c^{4} x^{4} x^{m}\, dx + \int \left(- 2 b^{2} c^{2} x^{2} x^{m} \operatorname{asin}^{2}{\left(c x \right)}\right)\, dx + \int b^{2} c^{4} x^{4} x^{m} \operatorname{asin}^{2}{\left(c x \right)}\, dx\\ &\quad \left. + \int \left(- 4 a b c^{2} x^{2} x^{m} \operatorname{asin}{\left(c x \right)}\right)\, dx + \int 2 a b c^{4} x^{4} x^{m} \operatorname{asin}{\left(c x \right)}\, dx\right)\end{aligned}$$

```
[In] integrate(x**m*(-c**2*d*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] d**2*(Integral(a**2*x**m, x) + Integral(b**2*x**m*asin(c*x)**2, x) + Integr
al(2*a*b*x**m*asin(c*x), x) + Integral(-2*a**2*c**2*x**2*x**m, x) + Integra
l(a**2*c**4*x**4*x**m, x) + Integral(-2*b**2*c**2*x**2*x**m*asin(c*x)**2, x
) + Integral(b**2*c**4*x**4*x**m*asin(c*x)**2, x) + Integral(-4*a*b*c**2*x*
*2*x**m*asin(c*x), x) + Integral(2*a*b*c**4*x**4*x**m*asin(c*x), x))
```

Maxima [F]

$$\int x^m (d - c^2 d x^2)^2 (a + b \arcsin(cx))^2 \, dx = \int (c^2 d x^2 - d)^2 (b \arcsin(cx) + a)^2 x^m \, dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] a^2*c^4*d^2*x^(m + 5)/(m + 5) - 2*a^2*c^2*d^2*x^(m + 3)/(m + 3) + a^2*d^2*x
^(m + 1)/(m + 1) + (((b^2*c^4*d^2*m^2 + 4*b^2*c^4*d^2*m + 3*b^2*c^4*d^2)*x^
5 - 2*(b^2*c^2*d^2*m^2 + 6*b^2*c^2*d^2*m + 5*b^2*c^2*d^2)*x^3 + (b^2*d^2*m^
2 + 8*b^2*d^2*m + 15*b^2*d^2)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))^2 + (m^3 + 9*m^2 + 23*m + 15)*integrate(-2*(((b^2*c^5*d^2*m^2 + 4*b^2*
c^5*d^2*m + 3*b^2*c^5*d^2)*x^5 - 2*(b^2*c^3*d^2*m^2 + 6*b^2*c^3*d^2*m + 5*b
^2*c^3*d^2)*x^3 + (b^2*c*d^2*m^2 + 8*b^2*c*d^2*m + 15*b^2*c*d^2)*x)*sqrt(c*
x + 1)*sqrt(-c*x + 1)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) - (a*b
*d^2*m^3 - (a*b*c^6*d^2*m^3 + 9*a*b*c^6*d^2*m^2 + 23*a*b*c^6*d^2*m + 15*a*b
*c^6*d^2)*x^6 + 9*a*b*d^2*m^2 + 23*a*b*d^2*m + 3*(a*b*c^4*d^2*m^3 + 9*a*b*c
^4*d^2*m^2 + 23*a*b*c^4*d^2*m + 15*a*b*c^4*d^2)*x^4 + 15*a*b*d^2 - 3*(a*b*c
^2*d^2*m^3 + 9*a*b*c^2*d^2*m^2 + 23*a*b*c^2*d^2*m + 15*a*b*c^2*d^2)*x^2)*x^
m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(m^3 - (c^2*m^3 + 9*c^2*m^2 +
 23*c^2*m + 15*c^2)*x^2 + 9*m^2 + 23*m + 15), x))/(m^3 + 9*m^2 + 23*m + 15)
```

Giac [F]

$$\int x^m (d - c^2 d x^2)^2 (a + b \arcsin(cx))^2 \, dx = \int (c^2 d x^2 - d)^2 (b \arcsin(cx) + a)^2 x^m \, dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*(b*arcsin(c*x) + a)^2*x^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^m (d-c^2dx^2)^2 (a+b\arcsin(cx))^2\,dx = \int x^m (a+b\operatorname{asin}(c\,x))^2 (d-c^2\,d\,x^2)^2\,dx$$

```
[In] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2,x)
[Out] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^2, x)
```

3.278 $\int x^m(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 25, antiderivative size = 371

$$\begin{aligned}
&\int x^m(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx\\
&=\frac{2b^2c^2dx^{3+m}}{(3+m)^3}-\frac{2bcdx^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)^2}\\
&\quad+\frac{2dx^{1+m}(a+b\arcsin(cx))^2}{3+4m+m^2}+\frac{dx^{1+m}(1-c^2x^2)(a+b\arcsin(cx))^2}{3+m}\\
&\quad-\frac{2bcdx^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(2+m)(3+m)^2}\\
&\quad-\frac{4bcdx^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{6+11m+6m^2+m^3}\\
&\quad+\frac{2b^2c^2dx^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(2+m)(3+m)^3}\\
&\quad+\frac{4b^2c^2dx^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(3+m)^2(2+3m+m^2)}
\end{aligned}$$

```
[Out] 2*b^2*c^2*d*x^(3+m)/(3+m)^3+2*d*x^(1+m)*(a+b*arcsin(c*x))^2/(m^2+4*m+3)+d*x
^(1+m)*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(3+m)-2*b*c*d*x^(2+m)*(a+b*arcsin(c
*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(2+m)/(3+m)^2-4*b*c*d*x^(2
+m)*(a+b*arcsin(c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/(m^3+6*m^
2+11*m+6)+2*b^2*c^2*d*x^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m,
 5/2+1/2*m],c^2*x^2)/(2+m)/(3+m)^3+4*b^2*c^2*d*x^(3+m)*hypergeom([1, 3/2+1/
2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m],c^2*x^2)/(3+m)^2/(m^2+3*m+2)-2*b*c*d*x
^(2+m)*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/(3+m)^2
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 371, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4787, 4723, 4805, 4783, 30}

$$\int x^m (d - c^2 dx^2) (a + b \arcsin(cx))^2 dx$$
$$= \frac{4b^2c^2dx^{m+3}\,{}_3F_2\left(1, \frac{m}{2}+\frac{3}{2}, \frac{m}{2}+\frac{3}{2}; \frac{m}{2}+2, \frac{m}{2}+\frac{5}{2}; c^2x^2\right)}{(m+3)^2(m^2+3m+2)}$$
$$+ \frac{2b^2c^2dx^{m+3}\,{}_3F_2\left(1, \frac{m}{2}+\frac{3}{2}, \frac{m}{2}+\frac{3}{2}; \frac{m}{2}+2, \frac{m}{2}+\frac{5}{2}; c^2x^2\right)}{(m+2)(m+3)^3}$$
$$- \frac{4bcdx^{m+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2}, \frac{m+2}{2}, \frac{m+4}{2}, c^2x^2\right)(a + b \arcsin(cx))}{m^3+6m^2+11m+6}$$
$$- \frac{2bcdx^{m+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2}, \frac{m+2}{2}, \frac{m+4}{2}, c^2x^2\right)(a + b \arcsin(cx))}{(m+2)(m+3)^2}$$
$$+ \frac{d(1-c^2x^2)\,x^{m+1}(a + b \arcsin(cx))^2}{m+3} - \frac{2bcd\sqrt{1-c^2x^2}x^{m+2}(a + b \arcsin(cx))}{(m+3)^2}$$
$$+ \frac{2dx^{m+1}(a + b \arcsin(cx))^2}{m^2+4m+3} + \frac{2b^2c^2dx^{m+3}}{(m+3)^3}$$

```
[In] Int[x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (2*b^2*c^2*d*x^(3 + m))/(3 + m)^3 - (2*b*c*d*x^(2 + m)*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/(3 + m)^2 + (2*d*x^(1 + m)*(a + b*ArcSin[c*x])^2)/(3 + 4
*m + m^2) + (d*x^(1 + m)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3 + m) - (2*
b*c*d*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 +
m)/2, c^2*x^2])/((2 + m)*(3 + m)^2) - (4*b*c*d*x^(2 + m)*(a + b*ArcSin[c*x]
)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(6 + 11*m + 6*m^2
+ m^3) + (2*b^2*c^2*d*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}
, {2 + m/2, 5/2 + m/2}, c^2*x^2])/((2 + m)*(3 + m)^3) + (4*b^2*c^2*d*x^(3 +
 m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*
x^2])/((3 + m)^2*(2 + 3*m + m^2))
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4805

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{dx^{1+m}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3+m} + \frac{(2d)\int x^m(a+b\arcsin(cx))^2\,dx}{3+m} \\
&\quad - \frac{(2bcd)\int x^{1+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{3+m} \\
&= -\frac{2bcdx^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)^2} + \frac{2dx^{1+m}(a+b\arcsin(cx))^2}{3+4m+m^2} \\
&\quad + \frac{dx^{1+m}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3+m} - \frac{(2bcd)\int \frac{x^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{(3+m)^2} \\
&\quad + \frac{(2b^2c^2d)\int x^{2+m}\,dx}{(3+m)^2} - \frac{(4bcd)\int \frac{x^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{3+4m+m^2}
\end{aligned}
$$

$$= \frac{2b^2c^2dx^{3+m}}{(3+m)^3} - \frac{2bcdx^{2+m}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(3+m)^2} + \frac{2dx^{1+m}(a+b\arcsin(cx))^2}{3+4m+m^2} + \frac{dx^{1+m}(1-c^2x^2)(a+b\arcsin(cx))^2}{3+m} - \frac{2bcdx^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{(2+m)(3+m)^2} - \frac{4bcdx^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{6+11m+6m^2+m^3} + \frac{2b^2c^2dx^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(2+m)(3+m)^3} + \frac{4b^2c^2dx^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{(1+m)(2+m)(3+m)^2}$$

Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 267, normalized size of antiderivative = 0.72

$$\int x^m(d-c^2dx^2)(a+b\arcsin(cx))^2\,dx = dx^{1+m}\Bigg(\frac{(a+b\arcsin(cx))^2}{1+m} - \frac{c^2x^2(a+b\arcsin(cx))^2}{3+m} + \frac{2bcx\left(-\left((3+m)(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)\right)+bcx\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};\right.\right.}{(1+m)(2+m)(3+m)} - \frac{2bc^3x^3\left(-\left((5+m)(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{4+m}{2},\frac{6+m}{2},c^2x^2\right)\right)+bcx\,{}_3F_2\left(1,\frac{5}{2}+\frac{m}{2},\frac{5}{2}+\right.\right.}{(3+m)(4+m)(5+m)}$$

```
[In] Integrate[x^m*(d - c^2*d*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] d*x^(1 + m)*((a + b*ArcSin[c*x])^2/(1 + m) - (c^2*x^2*(a + b*ArcSin[c*x])^2
)/(3 + m) + (2*b*c*x*(-((3 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2,
(2 + m)/2, (4 + m)/2, c^2*x^2]) + b*c*x*HypergeometricPFQ[{1, 3/2 + m/2, 3/
2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2]))/((1 + m)*(2 + m)*(3 + m)) - (2*b
*c^3*x^3*(-((5 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (4 + m)/2, (
6 + m)/2, c^2*x^2]) + b*c*x*HypergeometricPFQ[{1, 5/2 + m/2, 5/2 + m/2}, {3
 + m/2, 7/2 + m/2}, c^2*x^2]))/((3 + m)*(4 + m)*(5 + m)))
```

Maple [F]

$$\int x^{m} \left(-c^{2} d\,x^{2}+d\right) \left(a+b \arcsin \left(c x \right)\right)^{2}d x$$

```
[In] int(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x)
```

Fricas [F]

$$\int x^m \left(d-c^2dx^2\right) (a+b\arcsin(cx))^2\,dx = \int -\left(c^2dx^2-d\right)\left(b\arcsin\left(cx\right)+a\right)^2x^m\,dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*x^m, x)
```

Sympy [F]

$$\int x^m \left(d-c^2dx^2\right) (a+b\arcsin(cx))^2\,dx = -d\left(\int \left(-a^{2} x^{m}\right)\, dx + \int \left(- b^{2} x^{m} \operatorname{asin}^{2}{\left(c x \right)}\right)\, dx + \int \left(- 2 a b x^{m} \operatorname{asin}{\left(c x \right)}\right)\, dx + \int a^{2} c^{2} x^{2} x^{m}\, dx + \int b^{2} c^{2} x^{2} x^{m} \operatorname{asin}^{2}{\left(c x \right)}\, dx + \int 2 a b c^{2} x^{2} x^{m} \operatorname{asin}{\left(c x \right)}\, dx\right)$$

```
[In] integrate(x**m*(-c**2*d*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] -d*(Integral(-a**2*x**m, x) + Integral(-b**2*x**m*asin(c*x)**2, x) + Integr
al(-2*a*b*x**m*asin(c*x), x) + Integral(a**2*c**2*x**2*x**m, x) + Integral(
b**2*c**2*x**2*x**m*asin(c*x)**2, x) + Integral(2*a*b*c**2*x**2*x**m*asin(c
*x), x))
```

Maxima [F]

$$\int x^m (d - c^2dx^2) (a + b \arcsin(cx))^2 dx = \int -(c^2dx^2 - d)(b \arcsin(cx) + a)^2 x^m dx$$

[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")

[Out] -a^2*c^2*d*x^(m + 3)/(m + 3) + a^2*d*x^(m + 1)/(m + 1) - (((b^2*c^2*d*m + b^2*c^2*d)*x^3 - (b^2*d*m + 3*b^2*d)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + (m^2 + 4*m + 3)*integrate(2*(((b^2*c^3*d*m + b^2*c^3*d)*x^3 - (b^2*c*d*m + 3*b^2*c*d)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (a*b*d*m^2 + (a*b*c^4*d*m^2 + 4*a*b*c^4*d*m + 3*a*b*c^4*d)*x^4 + 4*a*b*d*m + 3*a*b*d - 2*(a*b*c^2*d*m^2 + 4*a*b*c^2*d*m + 3*a*b*c^2*d)*x^2)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/((c^2*m^2 + 4*c^2*m + 3*c^2)*x^2 - m^2 - 4*m - 3), x))/(m^2 + 4*m + 3)

Giac [F]

$$\int x^m (d - c^2dx^2) (a + b \arcsin(cx))^2 dx = \int -(c^2dx^2 - d)(b \arcsin(cx) + a)^2 x^m dx$$

[In] integrate(x^m*(-c^2*d*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")

[Out] integrate(-(c^2*d*x^2 - d)*(b*arcsin(c*x) + a)^2*x^m, x)

Mupad [F(-1)]

Timed out.

$$\int x^m (d - c^2dx^2) (a + b \arcsin(cx))^2 dx = \int x^m (a + b \operatorname{asin}(c x))^2 (d - c^2 d x^2) dx$$

[In] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2),x)

[Out] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2), x)

3.279 $\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 27

$$\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx=\text{Int}\left(\frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2},x\right)$$

```
[Out] Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx=\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx$$

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
```

```
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2), x]
```

Rubi steps

$$\text{integral}=\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 6.60 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.07

$$\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx=\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx$$

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2),x]
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.26 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00

$$\int \frac{x^m(a+b\arcsin\left(cx\right))^2}{-c^2d\,x^2+d}dx$$

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.59

$$\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx=\int -\frac{\left(b\arcsin\left(cx\right)+a\right)^2x^m}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="fricas")
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*x^m/(c^2*d*x^2 - d)
, x)
```

Sympy [N/A]

Not integrable

Time = 3.71 (sec) , antiderivative size = 66, normalized size of antiderivative = 2.44

$$\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx=-\frac{\int \frac{a^2x^m}{c^2x^2-1}\,dx+\int \frac{b^2x^m\operatorname{asin}^2{(cx)}}{c^2x^2-1}\,dx+\int \frac{2abx^m\operatorname{asin}{(cx)}}{c^2x^2-1}\,dx}{d}$$

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d),x)
[Out] -(Integral(a**2*x**m/(c**2*x**2 - 1), x) + Integral(b**2*x**m*asin(c*x)**2/
(c**2*x**2 - 1), x) + Integral(2*a*b*x**m*asin(c*x)/(c**2*x**2 - 1), x))/d
```

Maxima [N/A]

Not integrable

Time = 0.81 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.19

$$\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx=\int -\frac{(b\arcsin{(cx)}+a)^2x^m}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="maxima")
[Out] -integrate((b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d), x)
```

Giac [N/A]

Not integrable

Time = 0.93 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.15

$$\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx=\int -\frac{(b\arcsin{(cx)}+a)^2x^m}{c^2dx^2-d}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x, algorithm="giac")
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d), x)
```

Mupad [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.07

$$\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx=\int \frac{x^m\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{d-c^2\,d\,x^2}\,dx$$

```
[In] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2),x)
[Out] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2), x)
```

3.280 $\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 27

$$\begin{aligned}
&\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx \\
&= -\frac{bcx^{2+m}(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} \\
&\quad+\frac{bc(1+m)x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{d^2(2+m)} \\
&\quad+\frac{b^2c^2x^{3+m}\,\text{Hypergeometric2F1}\left(1,\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{d^2(3+m)} \\
&\quad-\frac{b^2c^2(1+m)x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{d^2(6+5m+m^2)} \\
&\quad+\frac{(1-m)\text{Int}\left(\frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2},x\right)}{2d}
\end{aligned}$$

```
[Out] 1/2*x^(1+m)*(a+b*arcsin(c*x))^2/d^2/(-c^2*x^2+1)+b*c*(1+m)*x^(2+m)*(a+b*arc
sin(c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/d^2/(2+m)+b^2*c^2*x^(
3+m)*hypergeom([1, 3/2+1/2*m],[5/2+1/2*m],c^2*x^2)/d^2/(3+m)-b^2*c^2*(1+m)*
x^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m],c^2*x^2)/d
^2/(m^2+5*m+6)-b*c*x^(2+m)*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)^(1/2)+1/2*(1-
m)*Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)/d
```

Rubi [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx$$

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
```

```
[Out] -((b*c*x^(2 + m)*(a + b*ArcSin[c*x]))/(d^2*Sqrt[1 - c^2*x^2])) + (x^(1 + m)
*(a + b*ArcSin[c*x])^2)/(2*d^2*(1 - c^2*x^2)) + (b*c*(1 + m)*x^(2 + m)*(a +
 b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(d^2
*(2 + m)) + (b^2*c^2*x^(3 + m)*Hypergeometric2F1[1, (3 + m)/2, (5 + m)/2, c
^2*x^2])/(d^2*(3 + m)) - (b^2*c^2*(1 + m)*x^(3 + m)*HypergeometricPFQ[{1, 3
/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/(d^2*(6 + 5*m + m^2))
 + ((1 - m)*Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2), x])/(2*
d)
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^{1+m}(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} - \frac{(bc)\int \frac{x^{1+m}(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{d^2} + \frac{(1-m)\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{2d} \\
&= -\frac{bcx^{2+m}(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{x^{1+m}(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} + \frac{(b^2c^2)\int \frac{x^{2+m}}{1-c^2x^2}\,dx}{d^2} \\
&\quad + \frac{(1-m)\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{2d} + \frac{(bc(1+m))\int \frac{x^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{d^2} \\
&= -\frac{bcx^{2+m}(a+b\arcsin(cx))}{d^2\sqrt{1-c^2x^2}} + \frac{x^{1+m}(a+b\arcsin(cx))^2}{2d^2(1-c^2x^2)} \\
&\quad + \frac{bc(1+m)x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{d^2(2+m)} \\
&\quad + \frac{b^2c^2x^{3+m}\,\text{Hypergeometric2F1}\left(1,\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{d^2(3+m)} \\
&\quad - \frac{b^2c^2(1+m)x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{d^2(6+5m+m^2)} \\
&\quad + \frac{(1-m)\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{2d}
\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 8.43 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.07

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx$$

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2,x]
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.28 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(-c^2d\,x^2+d)^2}dx$$

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x)
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 55, normalized size of antiderivative = 2.04

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^m}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*x^m/(c^4*d^2*x^4 - 2
*c^2*d^2*x^2 + d^2), x)
```

Sympy [N/A]

Not integrable

Time = 15.09 (sec) , antiderivative size = 92, normalized size of antiderivative = 3.41

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \frac{\int \frac{a^2x^m}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{b^2x^m\operatorname{asin}^2(cx)}{c^4x^4-2c^2x^2+1}\,dx + \int \frac{2abx^m\operatorname{asin}(cx)}{c^4x^4-2c^2x^2+1}\,dx}{d^2}$$

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**2,x)
[Out] (Integral(a**2*x**m/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(b**2*x**m*
asin(c*x)**2/(c**4*x**4 - 2*c**2*x**2 + 1), x) + Integral(2*a*b*x**m*asin(c
*x)/(c**4*x**4 - 2*c**2*x**2 + 1), x))/d**2
```

Maxima [N/A]

Not integrable

Time = 0.77 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.11

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^m}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="maxima")
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d)^2, x)
```

Giac [N/A]

Not integrable

Time = 0.90 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.11

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^m}{(c^2dx^2-d)^2}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d)^2, x)
```

Mupad [N/A]

Not integrable

Time = 0.17 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.07

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx=\int \frac{x^m\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^2}\,dx$$

```
[In] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2,x)
[Out] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^2, x)
```

3.281 $\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 27

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx$$
$$= -\frac{bcx^{2+m}(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(1-m)x^{2+m}(a+b\arcsin(cx))}{6d^3\sqrt{1-c^2x^2}}$$
$$- \frac{bc(3-m)x^{2+m}(a+b\arcsin(cx))}{4d^3\sqrt{1-c^2x^2}}$$
$$+ \frac{x^{1+m}(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{(3-m)x^{1+m}(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)}$$
$$+ \frac{bc(1-m)(1+m)x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{6d^3(2+m)}$$
$$+ \frac{bc(3-m)(1+m)x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{4d^3(2+m)}$$
$$+ \frac{b^2c^2(1-m)x^{3+m}\,\text{Hypergeometric2F1}\left(1,\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{6d^3(3+m)}$$
$$+ \frac{b^2c^2(3-m)x^{3+m}\,\text{Hypergeometric2F1}\left(1,\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{4d^3(3+m)}$$
$$+ \frac{b^2c^2x^{3+m}\,\text{Hypergeometric2F1}\left(2,\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{6d^3(3+m)}$$
$$- \frac{b^2c^2(1-m)(1+m)x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{6d^3(6+5m+m^2)}$$
$$- \frac{b^2c^2(3-m)(1+m)x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{4d^3(6+5m+m^2)}$$
$$+ \frac{(1-m)(3-m)\text{Int}\left(\frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2},x\right)}{8d^2}$$

```
[Out] -1/6*b*c*x^(2+m)*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^(3/2)+1/4*x^(1+m)*(a+b*
arcsin(c*x))^2/d^3/(-c^2*x^2+1)^2+1/8*(3-m)*x^(1+m)*(a+b*arcsin(c*x))^2/d^3
/(-c^2*x^2+1)+1/6*b*c*(1-m)*(1+m)*x^(2+m)*(a+b*arcsin(c*x))*hypergeom([1/2,
 1+1/2*m],[2+1/2*m],c^2*x^2)/d^3/(2+m)+1/4*b*c*(3-m)*(1+m)*x^(2+m)*(a+b*arc
sin(c*x))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/d^3/(2+m)+1/6*b^2*c^2
*(1-m)*x^(3+m)*hypergeom([1, 3/2+1/2*m],[5/2+1/2*m],c^2*x^2)/d^3/(3+m)+1/4*
b^2*c^2*(3-m)*x^(3+m)*hypergeom([1, 3/2+1/2*m],[5/2+1/2*m],c^2*x^2)/d^3/(3+
m)+1/6*b^2*c^2*x^(3+m)*hypergeom([2, 3/2+1/2*m],[5/2+1/2*m],c^2*x^2)/d^3/(3
+m)-1/6*b^2*c^2*(1-m)*(1+m)*x^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+
1/2*m, 5/2+1/2*m],c^2*x^2)/d^3/(m^2+5*m+6)-1/4*b^2*c^2*(3-m)*(1+m)*x^(3+m)*
hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2*m, 5/2+1/2*m],c^2*x^2)/d^3/(m^2+
5*m+6)-1/6*b*c*(1-m)*x^(2+m)*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^(1/2)-1/4*b
```

c(3-m)*x^(2+m)*(a+b*arcsin(c*x))/d^3/(-c^2*x^2+1)^(1/2)+1/8*(1-m)*(3-m)*Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d),x)/d^2

Rubi [N/A]

Not integrable

Time = 0.62 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx=\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx$$

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
```

```
[Out] -1/6*(b*c*x^(2 + m)*(a + b*ArcSin[c*x]))/(d^3*(1 - c^2*x^2)^(3/2)) - (b*c*(1 - m)*x^(2 + m)*(a + b*ArcSin[c*x]))/(6*d^3*Sqrt[1 - c^2*x^2]) - (b*c*(3 - m)*x^(2 + m)*(a + b*ArcSin[c*x]))/(4*d^3*Sqrt[1 - c^2*x^2]) + (x^(1 + m)*(a + b*ArcSin[c*x])^2)/(4*d^3*(1 - c^2*x^2)^2) + ((3 - m)*x^(1 + m)*(a + b*ArcSin[c*x])^2)/(8*d^3*(1 - c^2*x^2)) + (b*c*(1 - m)*(1 + m)*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(6*d^3*(2 + m)) + (b*c*(3 - m)*(1 + m)*x^(2 + m)*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/(4*d^3*(2 + m)) + (b^2*c^2*(1 - m)*x^(3 + m)*Hypergeometric2F1[1, (3 + m)/2, (5 + m)/2, c^2*x^2])/(6*d^3*(3 + m)) + (b^2*c^2*(3 - m)*x^(3 + m)*Hypergeometric2F1[1, (3 + m)/2, (5 + m)/2, c^2*x^2])/(4*d^3*(3 + m)) + (b^2*c^2*x^(3 + m)*Hypergeometric2F1[2, (3 + m)/2, (5 + m)/2, c^2*x^2])/(6*d^3*(3 + m)) - (b^2*c^2*(1 - m)*(1 + m)*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/(6*d^3*(6 + 5*m + m^2)) - (b^2*c^2*(3 - m)*(1 + m)*x^(3 + m)*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, c^2*x^2])/(4*d^3*(6 + 5*m + m^2)) + ((1 - m)*(3 - m)*Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2), x])/(8*d^2)
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^{1+m}(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2}-\frac{(bc)\int \frac{x^{1+m}(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{2d^3}+\frac{(3-m)\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^2}\,dx}{4d}\\
&= -\frac{bcx^{2+m}(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}}+\frac{x^{1+m}(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2}+\frac{(3-m)x^{1+m}(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)}\\
&\quad+\frac{(b^2c^2)\int \frac{x^{2+m}}{(1-c^2x^2)^2}\,dx}{6d^3}-\frac{(bc(1-m))\int \frac{x^{1+m}(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{6d^3}\\
&\quad-\frac{(bc(3-m))\int \frac{x^{1+m}(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{4d^3}+\frac{((1-m)(3-m))\int \frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{8d^2}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{bcx^{2+m}(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(1-m)x^{2+m}(a+b\arcsin(cx))}{6d^3\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc(3-m)x^{2+m}(a+b\arcsin(cx))}{4d^3\sqrt{1-c^2x^2}} + \frac{x^{1+m}(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} \\
&\quad + \frac{(3-m)x^{1+m}(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} + \frac{b^2c^2x^{3+m}\,\text{Hypergeometric2F1}\left(2,\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{6d^3(3+m)} \\
&\quad + \frac{(b^2c^2(1-m))\int\frac{x^{2+m}}{1-c^2x^2}\,dx}{6d^3} + \frac{(b^2c^2(3-m))\int\frac{x^{2+m}}{1-c^2x^2}\,dx}{4d^3} \\
&\quad + \frac{((1-m)(3-m))\int\frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{8d^2} + \frac{(bc(1-m)(1+m))\int\frac{x^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{6d^3} \\
&\quad + \frac{(bc(3-m)(1+m))\int\frac{x^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{4d^3}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{bcx^{2+m}(a+b\arcsin(cx))}{6d^3(1-c^2x^2)^{3/2}} - \frac{bc(1-m)x^{2+m}(a+b\arcsin(cx))}{6d^3\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc(3-m)x^{2+m}(a+b\arcsin(cx))}{4d^3\sqrt{1-c^2x^2}} \\
&\quad + \frac{x^{1+m}(a+b\arcsin(cx))^2}{4d^3(1-c^2x^2)^2} + \frac{(3-m)x^{1+m}(a+b\arcsin(cx))^2}{8d^3(1-c^2x^2)} \\
&\quad + \frac{bc(1-m)(1+m)x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{6d^3(2+m)} \\
&\quad + \frac{bc(3-m)(1+m)x^{2+m}(a+b\arcsin(cx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{4d^3(2+m)} \\
&\quad + \frac{b^2c^2(1-m)x^{3+m}\,\text{Hypergeometric2F1}\left(1,\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{6d^3(3+m)} \\
&\quad + \frac{b^2c^2(3-m)x^{3+m}\,\text{Hypergeometric2F1}\left(1,\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{4d^3(3+m)} \\
&\quad + \frac{b^2c^2x^{3+m}\,\text{Hypergeometric2F1}\left(2,\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{6d^3(3+m)} \\
&\quad - \frac{b^2c^2(1-m)(1+m)x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{6d^3(6+5m+m^2)} \\
&\quad - \frac{b^2c^2(3-m)(1+m)x^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};c^2x^2\right)}{4d^3(6+5m+m^2)} \\
&\quad + \frac{((1-m)(3-m))\int\frac{x^m(a+b\arcsin(cx))^2}{d-c^2dx^2}\,dx}{8d^2}
\end{aligned}
$$

Mathematica [N/A]

Not integrable

Time = 9.81 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.07

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx=\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx$$

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3,x]
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^3, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.32 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00

$$\int \frac{x^m\left(a+b\arcsin\left(cx\right)\right)^2}{\left(-c^2d\,x^2+d\right)^3}dx$$

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x)
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 69, normalized size of antiderivative = 2.56

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx=\int -\frac{\left(b\arcsin\left(cx\right)+a\right)^2x^m}{\left(c^2dx^2-d\right)^3}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="fricas")
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*x^m/(c^6*d^3*x^6 -
3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [N/A]

Not integrable

Time = 117.24 (sec) , antiderivative size = 119, normalized size of antiderivative = 4.41

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = -\frac{\int \frac{a^2x^m}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int \frac{b^2x^m\operatorname{asin}^2(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx+\int \frac{2abx^m\operatorname{asin}(cx)}{c^6x^6-3c^4x^4+3c^2x^2-1}\,dx}{d^3}$$

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**3,x)
```

```
[Out] -(Integral(a**2*x**m/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x) + Inte
gral(b**2*x**m*asin(c*x)**2/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1), x)
 + Integral(2*a*b*x**m*asin(c*x)/(c**6*x**6 - 3*c**4*x**4 + 3*c**2*x**2 - 1
), x))/d**3
```

Maxima [N/A]

Not integrable

Time = 0.90 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.19

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^m}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -integrate((b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d)^3, x)
```

Giac [N/A]

Not integrable

Time = 0.88 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.15

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx = \int -\frac{(b\arcsin(cx)+a)^2x^m}{(c^2dx^2-d)^3}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate(-(b*arcsin(c*x) + a)^2*x^m/(c^2*d*x^2 - d)^3, x)
```

Mupad [N/A]

Not integrable

Time = 0.17 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.07

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^3}\,dx=\int \frac{x^m\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d-c^2\,d\,x^2\right)}^3} \,d x$$

```
[In] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3,x)
[Out] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^3, x)
```

3.282 $\int x^m(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 29, antiderivative size = 29

$$\begin{aligned}
\int x^m\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx &= \frac{10b^2c^2d^2x^{3+m}\sqrt{d-c^2dx^2}}{(4+m)^3(6+m)} \\
&+ \frac{2b^2c^2d^2\left(52+15m+m^2\right)x^{3+m}\sqrt{d-c^2dx^2}}{(4+m)^2(6+m)^3} \\
&- \frac{2b^2c^4d^2x^{5+m}\sqrt{d-c^2dx^2}}{(6+m)^3} - \frac{30bcd^2x^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(2+m)^2(4+m)(6+m)\sqrt{1-c^2x^2}} \\
&- \frac{10bcd^2x^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(6+m)\left(8+6m+m^2\right)\sqrt{1-c^2x^2}} - \frac{2bcd^2x^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{\left(12+8m+m^2\right)\sqrt{1-c^2x^2}} \\
&+ \frac{10bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(4+m)^2(6+m)\sqrt{1-c^2x^2}} + \frac{4bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(4+m)(6+m)\sqrt{1-c^2x^2}} \\
&- \frac{2bc^5d^2x^{6+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(6+m)^2\sqrt{1-c^2x^2}} + \frac{15d^2x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{(6+m)\left(8+6m+m^2\right)} \\
&+ \frac{5dx^{1+m}\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{(4+m)(6+m)} + \frac{x^{1+m}\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{6+m} \\
&+ \frac{30b^2c^2d^2x^{3+m}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{(2+m)^2(3+m)(4+m)(6+m)\sqrt{1-c^2x^2}} \\
&+ \frac{10b^2c^2d^2(10+3m)x^{3+m}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{(2+m)(3+m)(4+m)^3(6+m)\sqrt{1-c^2x^2}} \\
&+ \frac{2b^2c^2d^2\left(264+130m+15m^2\right)x^{3+m}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{(2+m)(3+m)(4+m)^2(6+m)^3\sqrt{1-c^2x^2}} \\
&+ \frac{15d^3\text{Int}\left(\frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}},x\right)}{(6+m)\left(8+6m+m^2\right)}
\end{aligned}$$

```
[Out] 5*d*x^(1+m)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(4+m)/(6+m)+x^(1+m)*(-
c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(6+m)+10*b^2*c^2*d^2*x^(3+m)*(-c^2*d
*x^2+d)^(1/2)/(4+m)^3/(6+m)+2*b^2*c^2*d^2*(m^2+15*m+52)*x^(3+m)*(-c^2*d*x^2
+d)^(1/2)/(4+m)^2/(6+m)^3-2*b^2*c^4*d^2*x^(5+m)*(-c^2*d*x^2+d)^(1/2)/(6+m)^
3+15*d^2*x^(1+m)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(6+m)/(m^2+6*m+8)
-30*b*c*d^2*x^(2+m)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(2+m)^2/(4+m)/(6
+m)/(-c^2*x^2+1)^(1/2)-10*b*c*d^2*x^(2+m)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^
(1/2)/(6+m)/(m^2+6*m+8)/(-c^2*x^2+1)^(1/2)-2*b*c*d^2*x^(2+m)*(a+b*arcsin(c*
x))*(-c^2*d*x^2+d)^(1/2)/(m^2+8*m+12)/(-c^2*x^2+1)^(1/2)+10*b*c^3*d^2*x^(4+
m)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(4+m)^2/(6+m)/(-c^2*x^2+1)^(1/2)+
4*b*c^3*d^2*x^(4+m)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(4+m)/(6+m)/(-c^
2*x^2+1)^(1/2)-2*b*c^5*d^2*x^(6+m)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(
6+m)^2/(-c^2*x^2+1)^(1/2)+10*b^2*c^2*d^2*(10+3*m)*x^(3+m)*hypergeom([1/2, 3
/2+1/2*m],[5/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(4+m)^3/(6+m)/(m^2+5*m+
6)/(-c^2*x^2+1)^(1/2)+30*b^2*c^2*d^2*x^(3+m)*hypergeom([1/2, 3/2+1/2*m],[5/
2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(2+m)^2/(6+m)/(m^2+7*m+12)/(-c^2*x^2
+1)^(1/2)+2*b^2*c^2*d^2*(15*m^2+130*m+264)*x^(3+m)*hypergeom([1/2, 3/2+1/2*
m],[5/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(4+m)^2/(6+m)^3/(m^2+5*m+6)/(-
c^2*x^2+1)^(1/2)+15*d^3*Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)
^(1/2),x)/(6+m)/(m^2+6*m+8)
```

Rubi [N/A]

Not integrable

Time = 0.81 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int x^m \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int x^m \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx$$

```
[In] Int[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (10*b^2*c^2*d^2*x^(3 + m)*Sqrt[d - c^2*d*x^2])/((4 + m)^3*(6 + m)) + (2*b^2
*c^2*d^2*(52 + 15*m + m^2)*x^(3 + m)*Sqrt[d - c^2*d*x^2])/((4 + m)^2*(6 + m
)^3) - (2*b^2*c^4*d^2*x^(5 + m)*Sqrt[d - c^2*d*x^2])/(6 + m)^3 - (30*b*c*d^
2*x^(2 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((2 + m)^2*(4 + m)*(6
+ m)*Sqrt[1 - c^2*x^2]) - (10*b*c*d^2*x^(2 + m)*Sqrt[d - c^2*d*x^2]*(a + b*
ArcSin[c*x]))/((6 + m)*(8 + 6*m + m^2)*Sqrt[1 - c^2*x^2]) - (2*b*c*d^2*x^(2
 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((12 + 8*m + m^2)*Sqrt[1 - c
^2*x^2]) + (10*b*c^3*d^2*x^(4 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))
/((4 + m)^2*(6 + m)*Sqrt[1 - c^2*x^2]) + (4*b*c^3*d^2*x^(4 + m)*Sqrt[d - c^
2*d*x^2]*(a + b*ArcSin[c*x]))/((4 + m)*(6 + m)*Sqrt[1 - c^2*x^2]) - (2*b*c^
5*d^2*x^(6 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((6 + m)^2*Sqrt[1
- c^2*x^2]) + (15*d^2*x^(1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/
((6 + m)*(8 + 6*m + m^2)) + (5*d*x^(1 + m)*(d - c^2*d*x^2)^(3/2)*(a + b*Arc
```

```
Sin[c*x])^2)/((4 + m)*(6 + m)) + (x^(1 + m)*(d - c^2*d*x^2)^(5/2)*(a + b*Ar
cSin[c*x])^2)/(6 + m) + (30*b^2*c^2*d^2*x^(3 + m)*Sqrt[d - c^2*d*x^2]*Hyper
geometric2F1[1/2, (3 + m)/2, (5 + m)/2, c^2*x^2])/((2 + m)^2*(3 + m)*(4 + m
)*(6 + m)*Sqrt[1 - c^2*x^2]) + (10*b^2*c^2*d^2*(10 + 3*m)*x^(3 + m)*Sqrt[d
- c^2*d*x^2]*Hypergeometric2F1[1/2, (3 + m)/2, (5 + m)/2, c^2*x^2])/((2 + m
)*(3 + m)*(4 + m)^3*(6 + m)*Sqrt[1 - c^2*x^2]) + (2*b^2*c^2*d^2*(264 + 130*
m + 15*m^2)*x^(3 + m)*Sqrt[d - c^2*d*x^2]*Hypergeometric2F1[1/2, (3 + m)/2,
 (5 + m)/2, c^2*x^2])/((2 + m)*(3 + m)*(4 + m)^2*(6 + m)^3*Sqrt[1 - c^2*x^2
]) + (15*d^3*Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x]
)/((6 + m)*(8 + 6*m + m^2))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^{1+m}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{6+m} \\
&\quad+\frac{(5d)\int x^m(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2\,dx}{6+m} \\
&\quad-\frac{\left(2bcd^2\sqrt{d-c^2dx^2}\right)\int x^{1+m}(1-c^2x^2)^2(a+b\arcsin(cx))\,dx}{(6+m)\sqrt{1-c^2x^2}} \\
&= -\frac{2bcd^2x^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(12+8m+m^2)\sqrt{1-c^2x^2}} \\
&\quad+\frac{4bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(4+m)(6+m)\sqrt{1-c^2x^2}} \\
&\quad-\frac{2bc^5d^2x^{6+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(6+m)^2\sqrt{1-c^2x^2}} \\
&\quad+\frac{5dx^{1+m}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{(4+m)(6+m)} \\
&\quad+\frac{x^{1+m}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{6+m} \\
&\quad+\frac{(15d^2)\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx}{(4+m)(6+m)} \\
&\quad+\frac{\left(2b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^{2+m}\left(\frac{1}{2+m}-\frac{2c^2x^2}{4+m}+\frac{c^4x^4}{6+m}\right)}{\sqrt{1-c^2x^2}}\,dx}{(6+m)\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(10bcd^2\sqrt{d-c^2dx^2}\right)\int x^{1+m}(1-c^2x^2)(a+b\arcsin(cx))\,dx}{(4+m)(6+m)\sqrt{1-c^2x^2}}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{2b^2c^4d^2x^{5+m}\sqrt{d-c^2dx^2}}{(6+m)^3} - \frac{10bcd^2x^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(2+m)(4+m)(6+m)\sqrt{1-c^2x^2}} \\
&\quad - \frac{2bcd^2x^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(12+8m+m^2)\sqrt{1-c^2x^2}} \\
&\quad + \frac{10bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(4+m)^2(6+m)\sqrt{1-c^2x^2}} \\
&\quad + \frac{4bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(4+m)(6+m)\sqrt{1-c^2x^2}} \\
&\quad - \frac{2bc^5d^2x^{6+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(6+m)^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{15d^2x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{(2+m)(4+m)(6+m)} \\
&\quad + \frac{5dx^{1+m}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{(4+m)(6+m)} \\
&\quad + \frac{x^{1+m}(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{6+m} + \frac{(15d^3)\int\frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{(2+m)(4+m)(6+m)} \\
&\quad - \frac{\left(2b^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^{2+m}\left(-\frac{c^2(6+m)}{2+m}+\frac{c^4(52+15m+m^2)x^2}{(4+m)(6+m)}\right)}{\sqrt{1-c^2x^2}}\,dx}{(6+m)^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(10b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^{2+m}\left(\frac{1}{2+m}-\frac{c^2x^2}{4+m}\right)}{\sqrt{1-c^2x^2}}\,dx}{(4+m)(6+m)\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(30bcd^2\sqrt{d-c^2dx^2}\right)\int x^{1+m}(a+b\arcsin(cx))\,dx}{(2+m)(4+m)(6+m)\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{10b^2c^2d^2x^{3+m}\sqrt{d-c^2dx^2}}{(4+m)^3(6+m)} + \frac{2b^2c^2d^2(52+15m+m^2)\,x^{3+m}\sqrt{d-c^2dx^2}}{(4+m)^2(6+m)^3}$$
$$- \frac{2b^2c^4d^2x^{5+m}\sqrt{d-c^2dx^2}}{(6+m)^3} - \frac{30bcd^2x^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(2+m)^2(4+m)(6+m)\sqrt{1-c^2x^2}}$$
$$- \frac{10bcd^2x^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(2+m)(4+m)(6+m)\sqrt{1-c^2x^2}}$$
$$- \frac{2bcd^2x^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(12+8m+m^2)\sqrt{1-c^2x^2}}$$
$$+ \frac{10bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(4+m)^2(6+m)\sqrt{1-c^2x^2}}$$
$$+ \frac{4bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(4+m)(6+m)\sqrt{1-c^2x^2}}$$
$$- \frac{2bc^5d^2x^{6+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(6+m)^2\sqrt{1-c^2x^2}}$$
$$+ \frac{15d^2x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{(2+m)(4+m)(6+m)}$$
$$+ \frac{5dx^{1+m}(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{(4+m)(6+m)}$$
$$+ \frac{x^{1+m}(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))^2}{6+m}$$
$$+ \frac{(15d^3)\int\frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{(2+m)(4+m)(6+m)} + \frac{\left(30b^2c^2d^2\sqrt{d-c^2dx^2}\right)\int\frac{x^{2+m}}{\sqrt{1-c^2x^2}}\,dx}{(2+m)^2(4+m)(6+m)\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(10b^2c^2d^2(10+3m)\sqrt{d-c^2dx^2}\right)\int\frac{x^{2+m}}{\sqrt{1-c^2x^2}}\,dx}{(2+m)(4+m)^3(6+m)\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(2b^2c^2d^2(264+130m+15m^2)\sqrt{d-c^2dx^2}\right)\int\frac{x^{2+m}}{\sqrt{1-c^2x^2}}\,dx}{(2+m)(4+m)^2(6+m)^3\sqrt{1-c^2x^2}}$$

$$= \frac{10b^2c^2d^2x^{3+m}\sqrt{d-c^2dx^2}}{(4+m)^3(6+m)} + \frac{2b^2c^2d^2(52+15m+m^2)\,x^{3+m}\sqrt{d-c^2dx^2}}{(4+m)^2(6+m)^3}$$
$$- \frac{2b^2c^4d^2x^{5+m}\sqrt{d-c^2dx^2}}{(6+m)^3} - \frac{30bcd^2x^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(2+m)^2(4+m)(6+m)\sqrt{1-c^2x^2}}$$
$$- \frac{10bcd^2x^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(2+m)(4+m)(6+m)\sqrt{1-c^2x^2}}$$
$$- \frac{2bcd^2x^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(12+8m+m^2)\sqrt{1-c^2x^2}}$$
$$+ \frac{10bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(4+m)^2(6+m)\sqrt{1-c^2x^2}}$$
$$+ \frac{4bc^3d^2x^{4+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(4+m)(6+m)\sqrt{1-c^2x^2}}$$
$$- \frac{2bc^5d^2x^{6+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(6+m)^2\sqrt{1-c^2x^2}}$$
$$+ \frac{15d^2x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{(2+m)(4+m)(6+m)}$$
$$+ \frac{5dx^{1+m}(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{(4+m)(6+m)}$$
$$+ \frac{x^{1+m}(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))^2}{6+m}$$
$$+ \frac{30b^2c^2d^2x^{3+m}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{(2+m)^2(3+m)(4+m)(6+m)\sqrt{1-c^2x^2}}$$
$$+ \frac{10b^2c^2d^2(10+3m)x^{3+m}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{(2+m)(3+m)(4+m)^3(6+m)\sqrt{1-c^2x^2}}$$
$$+ \frac{2b^2c^2d^2(264+130m+15m^2)\,x^{3+m}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{(2+m)(3+m)(4+m)^2(6+m)^3\sqrt{1-c^2x^2}}$$
$$+ \frac{(15d^3)\int \frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{(2+m)(4+m)(6+m)}$$

Mathematica [N/A]

Not integrable

Time = 9.76 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int x^m\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx = \int x^m\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx$$

```
[In] Integrate[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[x^m*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 5.47 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int x^{m} \left(-c^{2} d \,x^{2}+d \right)^{\frac{5}{2}} \left(a +b \arcsin \left(c x \right)\right)^{2}d x$$

```
[In] int(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x)
[Out] int(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 134, normalized size of antiderivative = 4.62

$$\int x^m \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx=\int \left(-c^{2} d x^{2} + d\right)^{\frac{5}{2}} {\left(b \arcsin\left(c x\right) + a\right)}^{2} x^{m}\,{d x}$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
[Out] integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
- 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b*c
^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*x^m, x)
```

Sympy [F(-1)]

Timed out.

$$\int x^m \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx=\text{Timed out}$$

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 0.91 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int x^m \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx=\int { {\left(-c^{2} d x^{2} + d\right)}^{\frac{5}{2}} {\left(b \arcsin\left(c x\right) + a\right)}^{2} x^{m} \,d x}$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2*x^m, x)
```

Giac [F(-2)]

Exception generated.

$$\int x^m \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int x^m \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int x^m\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

3.283 $\int x^m(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 29, antiderivative size = 29

$$\int x^m\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\frac{2b^2c^2dx^{3+m}\sqrt{d-c^2dx^2}}{(4+m)^3}-\frac{6bcdx^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(2+m)^2(4+m)\sqrt{1-c^2x^2}}-\frac{2bcdx^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(8+6m+m^2)\sqrt{1-c^2x^2}}+\frac{2bc^3dx^{4+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(4+m)^2\sqrt{1-c^2x^2}}+\frac{3dx^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8+6m+m^2}+\frac{x^{1+m}\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{4+m}+\frac{6b^2c^2dx^{3+m}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{(2+m)^2(3+m)(4+m)\sqrt{1-c^2x^2}}+\frac{2b^2c^2d(10+3m)x^{3+m}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{(2+m)(3+m)(4+m)^3\sqrt{1-c^2x^2}}+\frac{3d^2\text{Int}\left(\frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}},x\right)}{8+6m+m^2}$$

```
[Out] x^(1+m)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(4+m)+2*b^2*c^2*d*x^(3+m)*
(-c^2*d*x^2+d)^(1/2)/(4+m)^3+3*d*x^(1+m)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)
^(1/2)/(m^2+6*m+8)-6*b*c*d*x^(2+m)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(
2+m)^2/(4+m)/(-c^2*x^2+1)^(1/2)-2*b*c*d*x^(2+m)*(a+b*arcsin(c*x))*(-c^2*d*x
^2+d)^(1/2)/(m^2+6*m+8)/(-c^2*x^2+1)^(1/2)+2*b*c^3*d*x^(4+m)*(a+b*arcsin(c*
x))*(-c^2*d*x^2+d)^(1/2)/(4+m)^2/(-c^2*x^2+1)^(1/2)+2*b^2*c^2*d*(10+3*m)*x^
(3+m)*hypergeom([1/2, 3/2+1/2*m],[5/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/
```

```
(4+m)^3/(m^2+5*m+6)/(-c^2*x^2+1)^(1/2)+6*b^2*c^2*d*x^(3+m)*hypergeom([1/2,
3/2+1/2*m],[5/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(2+m)^2/(m^2+7*m+12)/(
-c^2*x^2+1)^(1/2)+3*d^2*Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)
^(1/2),x)/(m^2+6*m+8)
```

Rubi [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int x^m \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx=\int x^m \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx$$

```
[In] Int[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (2*b^2*c^2*d*x^(3 + m)*Sqrt[d - c^2*d*x^2])/(4 + m)^3 - (6*b*c*d*x^(2 + m)*
Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((2 + m)^2*(4 + m)*Sqrt[1 - c^2*x^
2]) - (2*b*c*d*x^(2 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((8 + 6*m
 + m^2)*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*x^(4 + m)*Sqrt[d - c^2*d*x^2]*(a +
b*ArcSin[c*x]))/((4 + m)^2*Sqrt[1 - c^2*x^2]) + (3*d*x^(1 + m)*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])^2)/(8 + 6*m + m^2) + (x^(1 + m)*(d - c^2*d*x^2)
^(3/2)*(a + b*ArcSin[c*x])^2)/(4 + m) + (6*b^2*c^2*d*x^(3 + m)*Sqrt[d - c^2
*d*x^2]*Hypergeometric2F1[1/2, (3 + m)/2, (5 + m)/2, c^2*x^2])/((2 + m)^2*(
3 + m)*(4 + m)*Sqrt[1 - c^2*x^2]) + (2*b^2*c^2*d*(10 + 3*m)*x^(3 + m)*Sqrt[
d - c^2*d*x^2]*Hypergeometric2F1[1/2, (3 + m)/2, (5 + m)/2, c^2*x^2])/((2 +
 m)*(3 + m)*(4 + m)^3*Sqrt[1 - c^2*x^2]) + (3*d^2*Defer[Int][(x^m*(a + b*Ar
cSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x])/(8 + 6*m + m^2)
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{x^{1+m}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{4+m}\\ &\quad+\frac{(3d)\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx}{4+m}\\ &\quad-\frac{\left(2bcd\sqrt{d-c^2dx^2}\right)\int x^{1+m}(1-c^2x^2)\,(a+b\arcsin(cx))\,dx}{(4+m)\sqrt{1-c^2x^2}}\end{aligned}$$

$$= -\frac{2bcdx^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(8+6m+m^2)\sqrt{1-c^2x^2}} + \frac{2bc^3dx^{4+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(4+m)^2\sqrt{1-c^2x^2}} + \frac{3dx^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8+6m+m^2} + \frac{x^{1+m}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{4+m} + \frac{(3d^2)\int\frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}dx}{8+6m+m^2} + \frac{\left(2b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{x^{2+m}\left(\frac{1}{2+m}-\frac{c^2x^2}{4+m}\right)}{\sqrt{1-c^2x^2}}dx}{(4+m)\sqrt{1-c^2x^2}} - \frac{\left(6bcd\sqrt{d-c^2dx^2}\right)\int x^{1+m}(a+b\arcsin(cx))\,dx}{(2+m)(4+m)\sqrt{1-c^2x^2}}$$

$$= \frac{2b^2c^2dx^{3+m}\sqrt{d-c^2dx^2}}{(4+m)^3} - \frac{6bcdx^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(2+m)^2(4+m)\sqrt{1-c^2x^2}} - \frac{2bcdx^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(8+6m+m^2)\sqrt{1-c^2x^2}} + \frac{2bc^3dx^{4+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(4+m)^2\sqrt{1-c^2x^2}} + \frac{3dx^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8+6m+m^2} + \frac{x^{1+m}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{4+m} + \frac{(3d^2)\int\frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}dx}{8+6m+m^2} + \frac{\left(6b^2c^2d\sqrt{d-c^2dx^2}\right)\int\frac{x^{2+m}}{\sqrt{1-c^2x^2}}dx}{(2+m)^2(4+m)\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^2d(10+3m)\sqrt{d-c^2dx^2}\right)\int\frac{x^{2+m}}{\sqrt{1-c^2x^2}}dx}{(2+m)(4+m)^3\sqrt{1-c^2x^2}}$$

$$= \frac{2b^2c^2dx^{3+m}\sqrt{d-c^2dx^2}}{(4+m)^3} - \frac{6bcdx^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(2+m)^2(4+m)\sqrt{1-c^2x^2}} - \frac{2bcdx^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(8+6m+m^2)\sqrt{1-c^2x^2}} + \frac{2bc^3dx^{4+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(4+m)^2\sqrt{1-c^2x^2}} + \frac{3dx^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8+6m+m^2} + \frac{x^{1+m}(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{4+m} + \frac{6b^2c^2dx^{3+m}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{(2+m)^2(3+m)(4+m)\sqrt{1-c^2x^2}} + \frac{2b^2c^2d(10+3m)x^{3+m}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{(2+m)(3+m)(4+m)^3\sqrt{1-c^2x^2}} + \frac{(3d^2)\int\frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}dx}{8+6m+m^2}$$

Mathematica [N/A]

Not integrable

Time = 0.60 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int x^m \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \int x^m \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx$$

```
[In] Integrate[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[x^m*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.99 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int x^m \left(-c^2d\,x^2+d\right)^{\frac{3}{2}} (a+b\arcsin(cx))^2\,dx$$

```
[In] int(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x)
[Out] int(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 85, normalized size of antiderivative = 2.93

$$\int x^m \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}} (b\arcsin(cx)+a)^2 x^m\,dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
[Out] integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)*x^m, x)
```

Sympy [F(-1)]

Timed out.

$$\int x^m \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx=\text{Timed out}$$

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 0.76 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int x^m \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)^2x^m\,dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2*x^m, x)
```

Giac [F(-2)]

Exception generated.

$$\int x^m \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int x^m \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx=\int x^m\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(d-c^2\,d\,x^2\right)}^{3/2}\,dx$$

```
[In] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

3.284 $\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 29, antiderivative size = 29

$$\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = -\frac{2bcx^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(2+m)^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2+m}+\frac{2b^2c^2x^{3+m}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{(2+m)^2(3+m)\sqrt{1-c^2x^2}}+\frac{d\text{Int}\left(\frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}},x\right)}{2+m}$$

```
[Out] x^(1+m)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(2+m)-2*b*c*x^(2+m)*(a+b*a
rcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(2+m)^2/(-c^2*x^2+1)^(1/2)+2*b^2*c^2*x^(3+
m)*hypergeom([1/2, 3/2+1/2*m],[5/2+1/2*m],c^2*x^2)*(-c^2*d*x^2+d)^(1/2)/(2+
m)^2/(3+m)/(-c^2*x^2+1)^(1/2)+d*Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*
d*x^2+d)^(1/2),x)/(2+m)
```

Rubi [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$

```
[In] Int[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-2*b*c*x^(2 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/((2 + m)^2*Sqrt[
1 - c^2*x^2]) + (x^(1 + m)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(2 +
m) + (2*b^2*c^2*x^(3 + m)*Sqrt[d - c^2*d*x^2]*Hypergeometric2F1[1/2, (3 + m
)/2, (5 + m)/2, c^2*x^2])/((2 + m)^2*(3 + m)*Sqrt[1 - c^2*x^2]) + (d*Defer[
Int][(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x])/(2 + m)
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2+m}+\frac{d\int\frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{2+m} \\
&\quad-\frac{\left(2bc\sqrt{d-c^2dx^2}\right)\int x^{1+m}(a+b\arcsin(cx))\,dx}{(2+m)\sqrt{1-c^2x^2}} \\
&= -\frac{2bcx^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(2+m)^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2+m} \\
&\quad+\frac{d\int\frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{2+m}+\frac{\left(2b^2c^2\sqrt{d-c^2dx^2}\right)\int\frac{x^{2+m}}{\sqrt{1-c^2x^2}}\,dx}{(2+m)^2\sqrt{1-c^2x^2}} \\
&= -\frac{2bcx^{2+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(2+m)^2\sqrt{1-c^2x^2}}+\frac{x^{1+m}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2+m} \\
&\quad+\frac{2b^2c^2x^{3+m}\sqrt{d-c^2dx^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+m}{2},\frac{5+m}{2},c^2x^2\right)}{(2+m)^2(3+m)\sqrt{1-c^2x^2}}+\frac{d\int\frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx}{2+m}
\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$

```
[In] Integrate[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[x^m*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.75 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int x^{m}\sqrt{-c^{2}d\,x^{2}+d}\,(a+b\arcsin\left(cx\right))^{2}\,dx$$

```
[In] int(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.41

$$\int x^{m}\sqrt{d-c^{2}dx^{2}}(a+b\arcsin(cx))^{2}\,dx=\int\sqrt{-c^{2}dx^{2}+d}(b\arcsin\left(cx\right)+a)^{2}x^{m}\,dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
*x^m, x)
```

Sympy [N/A]

Not integrable

Time = 20.06 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int x^{m}\sqrt{d-c^{2}dx^{2}}(a+b\arcsin(cx))^{2}\,dx=\int x^{m}\sqrt{-d\left(cx-1\right)\left(cx+1\right)}(a+b\operatorname{asin}\left(cx\right))^{2}\,dx$$

```
[In] integrate(x**m*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**m*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2, x)
```

Maxima [N/A]

Not integrable

Time = 0.58 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)^2x^m\,dx$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^2*x^m, x)
```

Giac [F(-2)]

Exception generated.

$$\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.35 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int x^m\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int x^m\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int(x^m*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

3.285 $\int \frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 29

$$\int \frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \text{Int}\left(\frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}},x\right)$$

```
[Out] Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$$

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x]
```

Rubi steps

$$\text{integral} = \int \frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 3.90 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int \frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$$

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2], x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.39 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int \frac{x^m(a+b\arcsin(cx))^2}{\sqrt{-c^2d\,x^2+d}}dx$$

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 56, normalized size of antiderivative = 1.93

$$\int \frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(b\arcsin(cx)+a)^2x^m}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="fricas
")
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)*x^m/(c^2*d*x^2 - d), x)
```

Sympy [N/A]

Not integrable

Time = 7.69 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int \frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{x^m(a+b\,\mathrm{asin}\,(cx))^2}{\sqrt{-d\,(cx-1)\,(cx+1)}}\,dx$$

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
[Out] Integral(x**m*(a + b*asin(c*x))**2/sqrt(-d*(c*x - 1)*(c*x + 1)), x)
```

Maxima [N/A]

Not integrable

Time = 0.59 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(b\arcsin{(cx)}+a)^2x^m}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="maxima
")
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/sqrt(-c^2*d*x^2 + d), x)
```

Giac [N/A]

Not integrable

Time = 1.07 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(b\arcsin{(cx)}+a)^2x^m}{\sqrt{-c^2dx^2+d}}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/sqrt(-c^2*d*x^2 + d), x)
```

Mupad [N/A]

Not integrable

Time = 0.32 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{x^m(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{x^m\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

```
[In] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
[Out] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

3.286 $\int \frac{x^m(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 29

$$\int \frac{x^m(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx=\text{Int}\left(\frac{x^m(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.10 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{x^m(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$$

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

```
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2), x]
```

Rubi steps

$$\text{integral}=\int \frac{x^m(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 4.39 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$$

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.34 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(-c^2d\,x^2+d)^{\frac{3}{2}}}dx$$

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 68, normalized size of antiderivative = 2.34

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(b\arcsin(cx)+a)^2x^m}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="fricas
")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
*x^m/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [N/A]

Not integrable

Time = 11.90 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{x^m(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
[Out] Integral(x**m*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [N/A]

Not integrable

Time = 0.63 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^m}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="maxima
")
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(-c^2*d*x^2 + d)^(3/2), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{x^m\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

```
[In] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
[Out] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

3.287 $\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 29

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \mathrm{Int}\left(\frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.10 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$$

```
[In] Int[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
[Out] Defer[Int][(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2), x]
```

Rubi steps

$$\text{integral} = \int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 4.56 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$$

```
[In] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

```
[Out] Integrate[(x^m*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.37 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(-c^2d\,x^2+d)^{\frac{5}{2}}}dx$$

```
[In] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

```
[Out] int(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 82, normalized size of antiderivative = 2.83

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(b\arcsin(cx)+a)^2x^m}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="fricas
")
```

```
[Out] integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)*x^m/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [N/A]

Not integrable

Time = 152.97 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{x^m(a+b\,\mathrm{asin}\,(cx))^2}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x**m*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**m*(a + b*asin(c*x))**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [N/A]

Not integrable

Time = 0.66 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(b\arcsin\,(cx)+a)^2x^m}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="maxima
")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^m/(-c^2*d*x^2 + d)^(5/2), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater Err
or: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{x^m(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{x^m\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

```
[In] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
[Out] int((x^m*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

3.288 $\int \frac{x^m \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{x^m \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \text{Int}\left(\frac{x^m \arcsin(ax)^2}{\sqrt{1-a^2x^2}},x\right)$$

```
[Out] Unintegrable(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx$$

```
[In] Int[(x^m*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] Defer[Int][(x^m*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2], x]
```

Rubi steps

$$\text{integral} = \int \frac{x^m \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.90 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{x^m \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx$$

```
[In] Integrate[(x^m*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2],x]
[Out] Integrate[(x^m*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2], x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.29 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{x^m \arcsin\left(ax\right)^2}{\sqrt{-a^2x^2+1}}dx$$

```
[In] int(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x)
[Out] int(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.50

$$\int \frac{x^m \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin\left(ax\right)^2}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m*arcsin(a*x)^2/(a^2*x^2 - 1), x)
```

Sympy [N/A]

Not integrable

Time = 1.14 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{x^m \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \operatorname{asin}^2\left(ax\right)}{\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

```
[In] integrate(x**m*asin(a*x)**2/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x**m*asin(a*x)**2/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Maxima [N/A]

Not integrable

Time = 0.44 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{x^m \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin{(ax)}^2}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^m*arcsin(a*x)^2/sqrt(-a^2*x^2 + 1), x)
```

Giac [N/A]

Not integrable

Time = 0.62 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{x^m \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin{(ax)}^2}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^m*arcsin(a*x)^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(x^m*arcsin(a*x)^2/sqrt(-a^2*x^2 + 1), x)
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{x^m \arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \operatorname{asin}(a\,x)^2}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^m*asin(a*x)^2)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^m*asin(a*x)^2)/(1 - a^2*x^2)^(1/2), x)
```

3.289 $\int (c-a^2cx^2)^3 \arcsin(ax)^3 \, dx$

Optimal result

Integrand size = 20, antiderivative size = 370

$$\int (c-a^2cx^2)^3 \arcsin(ax)^3 \, dx$$
$$= -\frac{413312c^3\sqrt{1-a^2x^2}}{128625a} - \frac{30256c^3(1-a^2x^2)^{3/2}}{385875a} - \frac{2664c^3(1-a^2x^2)^{5/2}}{214375a} - \frac{6c^3(1-a^2x^2)^{7/2}}{2401a}$$
$$- \frac{4322c^3x\arcsin(ax)}{1225} + \frac{1514a^2c^3x^3\arcsin(ax)}{3675} - \frac{702a^4c^3x^5\arcsin(ax)}{6125}$$
$$+ \frac{6}{343}a^6c^3x^7\arcsin(ax) + \frac{48c^3\sqrt{1-a^2x^2}\arcsin(ax)^2}{35a} + \frac{8c^3(1-a^2x^2)^{3/2}\arcsin(ax)^2}{35a} + \frac{18c^3(1-a^2x^2)^{5/2}\, a}{175a}$$

```
[Out] -30256/385875*c^3*(-a^2*x^2+1)^(3/2)/a-2664/214375*c^3*(-a^2*x^2+1)^(5/2)/a
-6/2401*c^3*(-a^2*x^2+1)^(7/2)/a-4322/1225*c^3*x*arcsin(a*x)+1514/3675*a^2*
c^3*x^3*arcsin(a*x)-702/6125*a^4*c^3*x^5*arcsin(a*x)+6/343*a^6*c^3*x^7*arcs
in(a*x)+8/35*c^3*(-a^2*x^2+1)^(3/2)*arcsin(a*x)^2/a+18/175*c^3*(-a^2*x^2+1)
^(5/2)*arcsin(a*x)^2/a+3/49*c^3*(-a^2*x^2+1)^(7/2)*arcsin(a*x)^2/a+16/35*c^
3*x*arcsin(a*x)^3+8/35*c^3*x*(-a^2*x^2+1)*arcsin(a*x)^3+6/35*c^3*x*(-a^2*x^
2+1)^2*arcsin(a*x)^3+1/7*c^3*x*(-a^2*x^2+1)^3*arcsin(a*x)^3-413312/128625*c
^3*(-a^2*x^2+1)^(1/2)/a+48/35*c^3*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a
```

Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 370, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.650, Rules used = {4743, 4715, 4767, 267, 4739, 455, 45, 200, 12, 1261, 712, 1813, 1864}

$$\int (c-a^2cx^2)^3 \arcsin(ax)^3\,dx = \frac{6}{343}a^6c^3x^7\arcsin(ax)-\frac{702a^4c^3x^5\arcsin(ax)}{6125}+\frac{1514a^2c^3x^3\arcsin(ax)}{3675}+\frac{1}{7}c^3x(1-a^2x^2)^3\arcsin(ax)^3+\frac{6}{35}c^3x(1-a^2x^2)^2\arcsin(ax)^3+\frac{8}{35}c^3x(1-a^2x^2)\arcsin(ax)^3+\frac{3c^3(1-a^2x^2)^{7/2}\arcsin(ax)^2}{49a}+\frac{18c^3(1-a^2x^2)^{5/2}\arcsin(ax)^2}{175a}+\frac{8c^3(1-a^2x^2)^{3/2}\arcsin(ax)^2}{35a}+\frac{48c^3\sqrt{1-a^2x^2}\arcsin(ax)^2}{35a}-\frac{6c^3(1-a^2x^2)^{7/2}}{2401a}-\frac{2664c^3(1-a^2x^2)^{5/2}}{214375a}-\frac{30256c^3(1-a^2x^2)^{3/2}}{385875a}-\frac{413312c^3\sqrt{1-a^2x^2}}{128625a}+\frac{16}{35}c^3x\arcsin(ax)^3-\frac{4322c^3x\arcsin(ax)}{1225}$$

```
[In] Int[(c - a^2*c*x^2)^3*ArcSin[a*x]^3,x]
```

```
[Out] (-413312*c^3*Sqrt[1 - a^2*x^2])/(128625*a) - (30256*c^3*(1 - a^2*x^2)^(3/2)
)/(385875*a) - (2664*c^3*(1 - a^2*x^2)^(5/2))/(214375*a) - (6*c^3*(1 - a^2*
x^2)^(7/2))/(2401*a) - (4322*c^3*x*ArcSin[a*x])/1225 + (1514*a^2*c^3*x^3*Ar
cSin[a*x])/3675 - (702*a^4*c^3*x^5*ArcSin[a*x])/6125 + (6*a^6*c^3*x^7*ArcSi
n[a*x])/343 + (48*c^3*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(35*a) + (8*c^3*(1 -
 a^2*x^2)^(3/2)*ArcSin[a*x]^2)/(35*a) + (18*c^3*(1 - a^2*x^2)^(5/2)*ArcSin[
a*x]^2)/(175*a) + (3*c^3*(1 - a^2*x^2)^(7/2)*ArcSin[a*x]^2)/(49*a) + (16*c^
3*x*ArcSin[a*x]^3)/35 + (8*c^3*x*(1 - a^2*x^2)*ArcSin[a*x]^3)/35 + (6*c^3*x
*(1 - a^2*x^2)^2*ArcSin[a*x]^3)/35 + (c^3*x*(1 - a^2*x^2)^3*ArcSin[a*x]^3)/
7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{1}{7}c^3x\left(1-a^2x^2\right)^3\arcsin(ax)^3+\frac{1}{7}(6c)\int\left(c-a^2cx^2\right)^2\arcsin(ax)^3\,dx\\&\quad-\frac{1}{7}\left(3ac^3\right)\int x\left(1-a^2x^2\right)^{5/2}\arcsin(ax)^2\,dx\end{aligned}$$

$$=\frac{3c^3(1-a^2x^2)^{7/2}\arcsin(ax)^2}{49a}$$
$$+\frac{6}{35}c^3x\left(1-a^2x^2\right)^2\arcsin(ax)^3+\frac{1}{7}c^3x\left(1-a^2x^2\right)^3\arcsin(ax)^3$$
$$+\frac{1}{35}\left(24c^2\right)\int\left(c-a^2cx^2\right)\arcsin(ax)^3\,dx-\frac{1}{49}\left(6c^3\right)\int\left(1-a^2x^2\right)^3\arcsin(ax)\,dx$$
$$-\frac{1}{35}\left(18ac^3\right)\int x\left(1-a^2x^2\right)^{3/2}\arcsin(ax)^2\,dx$$

$$=-\frac{6}{49}c^3x\arcsin(ax)+\frac{6}{49}a^2c^3x^3\arcsin(ax)$$
$$-\frac{18}{245}a^4c^3x^5\arcsin(ax)+\frac{6}{343}a^6c^3x^7\arcsin(ax)$$
$$+\frac{18c^3(1-a^2x^2)^{5/2}\arcsin(ax)^2}{175a}+\frac{3c^3(1-a^2x^2)^{7/2}\arcsin(ax)^2}{49a}$$
$$+\frac{8}{35}c^3x\left(1-a^2x^2\right)\arcsin(ax)^3+\frac{6}{35}c^3x\left(1-a^2x^2\right)^2\arcsin(ax)^3$$
$$+\frac{1}{7}c^3x\left(1-a^2x^2\right)^3\arcsin(ax)^3-\frac{1}{175}\left(36c^3\right)\int\left(1-a^2x^2\right)^2\arcsin(ax)\,dx$$
$$+\frac{1}{35}\left(16c^3\right)\int\arcsin(ax)^3\,dx+\frac{1}{49}\left(6ac^3\right)\int\frac{x(35-35a^2x^2+21a^4x^4-5a^6x^6)}{35\sqrt{1-a^2x^2}}\,dx$$
$$-\frac{1}{35}\left(24ac^3\right)\int x\sqrt{1-a^2x^2}\arcsin(ax)^2\,dx$$

$$=-\frac{402c^3x\arcsin(ax)}{1225}+\frac{318a^2c^3x^3\arcsin(ax)}{1225}-\frac{702a^4c^3x^5\arcsin(ax)}{6125}$$
$$+\frac{6}{343}a^6c^3x^7\arcsin(ax)+\frac{8c^3(1-a^2x^2)^{3/2}\arcsin(ax)^2}{35a}$$
$$+\frac{18c^3(1-a^2x^2)^{5/2}\arcsin(ax)^2}{175a}+\frac{3c^3(1-a^2x^2)^{7/2}\arcsin(ax)^2}{49a}$$
$$+\frac{16}{35}c^3x\arcsin(ax)^3+\frac{8}{35}c^3x\left(1-a^2x^2\right)\arcsin(ax)^3+\frac{6}{35}c^3x\left(1-a^2x^2\right)^2\arcsin(ax)^3+\frac{1}{7}c^3x\left(1-a^2x^2\right.$$

$$=-\frac{962c^3x\arcsin(ax)}{1225}+\frac{1514a^2c^3x^3\arcsin(ax)}{3675}-\frac{702a^4c^3x^5\arcsin(ax)}{6125}$$
$$+\frac{6}{343}a^6c^3x^7\arcsin(ax)+\frac{48c^3\sqrt{1-a^2x^2}\arcsin(ax)^2}{35a}+\frac{8c^3(1-a^2x^2)^{3/2}\arcsin(ax)^2}{35a}$$
$$+\frac{18c^3(1-a^2x^2)^{5/2}\arcsin(ax)^2}{175a}+\frac{3c^3(1-a^2x^2)^{7/2}\arcsin(ax)^2}{49a}$$
$$+\frac{16}{35}c^3x\arcsin(ax)^3+\frac{8}{35}c^3x\left(1-a^2x^2\right)\arcsin(ax)^3+\frac{6}{35}c^3x\left(1-a^2x^2\right)^2\arcsin(ax)^3+\frac{1}{7}c^3x\left(1-a^2x^2\right.$$

$$= -\frac{4322c^3x\arcsin(ax)}{1225} + \frac{1514a^2c^3x^3\arcsin(ax)}{3675} - \frac{702a^4c^3x^5\arcsin(ax)}{6125} + \frac{6}{343}a^6c^3x^7\arcsin(ax) + \frac{48c^3\sqrt{1-a^2x^2}\arcsin(ax)^2}{35a} + \frac{8c^3(1-a^2x^2)^{3/2}\arcsin(ax)^2}{35a} + \frac{18c^3(1-a^2x^2)^{5/2}\arcsin(ax)^2}{175a} + \frac{3c^3(1-a^2x^2)^{7/2}\arcsin(ax)^2}{49a} + \frac{16}{35}c^3x\arcsin(ax)^3 + \frac{8}{35}c^3x(1-a^2x^2)\arcsin(ax)^3 + \frac{6}{35}c^3x(1-a^2x^2)^2\arcsin(ax)^3 + \frac{1}{7}c^3x(1-a^2x^2)^3$$

$$= -\frac{960c^3\sqrt{1-a^2x^2}}{343a} - \frac{16c^3(1-a^2x^2)^{3/2}}{1715a} - \frac{36c^3(1-a^2x^2)^{5/2}}{8575a} - \frac{6c^3(1-a^2x^2)^{7/2}}{2401a} - \frac{4322c^3x\arcsin(ax)}{1225} + \frac{1514a^2c^3x^3\arcsin(ax)}{3675} - \frac{702a^4c^3x^5\arcsin(ax)}{6125} + \frac{6}{343}a^6c^3x^7\arcsin(ax) + \frac{48c^3\sqrt{1-a^2x^2}\arcsin(ax)^2}{35a} + \frac{8c^3(1-a^2x^2)^{3/2}\arcsin(ax)^2}{35a} + \frac{18c^3(1-a^2x}{1}$$

$$= -\frac{413312c^3\sqrt{1-a^2x^2}}{128625a} - \frac{30256c^3(1-a^2x^2)^{3/2}}{385875a} - \frac{2664c^3(1-a^2x^2)^{5/2}}{214375a} - \frac{6c^3(1-a^2x^2)^{7/2}}{2401a} - \frac{4322c^3x\arcsin(ax)}{1225} + \frac{1514a^2c^3x^3\arcsin(ax)}{3675} - \frac{702a^4c^3x^5\arcsin(ax)}{6125} + \frac{6}{343}a^6c^3x^7\arcsin(ax) + \frac{48c^3\sqrt{1-a^2x^2}\arcsin(ax)^2}{35a} + \frac{8c^3(1-a^2x^2)^{3/2}\arcsin(ax)^2}{35a} + \frac{18c^3(1-a^2x}{1}$$

Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 171, normalized size of antiderivative = 0.46

$$\int (c-a^2cx^2)^3\arcsin(ax)^3\,dx = \frac{c^3\left(2\sqrt{1-a^2x^2}(-22329151+747937a^2x^2-134541a^4x^4+16875a^6x^6)+210ax(-226905+26495a^2x^2-7\right.}{}$$

```
[In] Integrate[(c - a^2*c*x^2)^3*ArcSin[a*x]^3,x]
```

```
[Out] (c^3*(2*Sqrt[1 - a^2*x^2]*(-22329151 + 747937*a^2*x^2 - 134541*a^4*x^4 + 16
875*a^6*x^6) + 210*a*x*(-226905 + 26495*a^2*x^2 - 7371*a^4*x^4 + 1125*a^6*x
^6)*ArcSin[a*x] - 11025*Sqrt[1 - a^2*x^2]*(-2161 + 757*a^2*x^2 - 351*a^4*x^
4 + 75*a^6*x^6)*ArcSin[a*x]^2 - 385875*a*x*(-35 + 35*a^2*x^2 - 21*a^4*x^4 +
 5*a^6*x^6)*ArcSin[a*x]^3))/(13505625*a)
```

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 278, normalized size of antiderivative = 0.75

method	result
derivativedivides	$-\frac{c^3\left(1929375\arcsin(ax)^3a^7x^7+826875\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^6x^6-8103375a^5x^5\arcsin(ax)^3-236250\arcsin(ax)a^7x}{}$
default	$-\frac{c^3\left(1929375\arcsin(ax)^3a^7x^7+826875\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^6x^6-8103375a^5x^5\arcsin(ax)^3-236250\arcsin(ax)a^7x}{}$

```
[In] int((-a^2*c*x^2+c)^3*arcsin(a*x)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/13505625/a*c^3*(1929375*arcsin(a*x)^3*a^7*x^7+826875*arcsin(a*x)^2*(-a^2
*x^2+1)^(1/2)*a^6*x^6-8103375*a^5*x^5*arcsin(a*x)^3-236250*arcsin(a*x)*a^7*
x^7-3869775*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^4*x^4-33750*x^6*a^6*(-a^2*x^
2+1)^(1/2)+13505625*a^3*x^3*arcsin(a*x)^3+1547910*a^5*x^5*arcsin(a*x)+83459
25*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^2*x^2+269082*a^4*x^4*(-a^2*x^2+1)^(1/
2)-13505625*a*x*arcsin(a*x)^3-5563950*a^3*x^3*arcsin(a*x)-23825025*arcsin(a
*x)^2*(-a^2*x^2+1)^(1/2)-1495874*a^2*x^2*(-a^2*x^2+1)^(1/2)+47650050*a*x*ar
csin(a*x)+44658302*(-a^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 202, normalized size of antiderivative = 0.55

$$\int (c-a^2cx^2)^3\arcsin(ax)^3\,dx = -\frac{385875\,(5\,a^7c^3x^7-21\,a^5c^3x^5+35\,a^3c^3x^3-35\,ac^3x)\arcsin(ax)^3-210\,(1125\,a^7c^3x^7-7371\,a^5c^3x^5+2}{}$$

```
[In] integrate((-a^2*c*x^2+c)^3*arcsin(a*x)^3,x, algorithm="fricas")
```

```
[Out] -1/13505625*(385875*(5*a^7*c^3*x^7 - 21*a^5*c^3*x^5 + 35*a^3*c^3*x^3 - 35*a
*c^3*x)*arcsin(a*x)^3 - 210*(1125*a^7*c^3*x^7 - 7371*a^5*c^3*x^5 + 26495*a^
3*c^3*x^3 - 226905*a*c^3*x)*arcsin(a*x) - (33750*a^6*c^3*x^6 - 269082*a^4*c
^3*x^4 + 1495874*a^2*c^3*x^2 - 44658302*c^3 - 11025*(75*a^6*c^3*x^6 - 351*a
^4*c^3*x^4 + 757*a^2*c^3*x^2 - 2161*c^3)*arcsin(a*x)^2)*sqrt(-a^2*x^2 + 1))
/a
```

Sympy [A] (verification not implemented)

Time = 1.14 (sec) , antiderivative size = 355, normalized size of antiderivative = 0.96

$$\int \left(c-a^2cx^2\right)^3 \arcsin(ax)^3\,dx$$
$$= \begin{cases} -\frac{a^6c^3x^7\operatorname{asin}^3(ax)}{7} + \frac{6a^6c^3x^7\operatorname{asin}(ax)}{343} - \frac{3a^5c^3x^6\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{49} + \frac{6a^5c^3x^6\sqrt{-a^2x^2+1}}{2401} + \frac{3a^4c^3x^5\operatorname{asin}^3(ax)}{5} - \frac{702a^4c^3x^5\operatorname{asi}}{6125} \\ 0 \end{cases}$$

```
[In] integrate((-a**2*c*x**2+c)**3*asin(a*x)**3,x)
```

```
[Out] Piecewise((-a**6*c**3*x**7*asin(a*x)**3/7 + 6*a**6*c**3*x**7*asin(a*x)/343
- 3*a**5*c**3*x**6*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/49 + 6*a**5*c**3*x**6*
sqrt(-a**2*x**2 + 1)/2401 + 3*a**4*c**3*x**5*asin(a*x)**3/5 - 702*a**4*c**3
*x**5*asin(a*x)/6125 + 351*a**3*c**3*x**4*sqrt(-a**2*x**2 + 1)*asin(a*x)**2
/1225 - 29898*a**3*c**3*x**4*sqrt(-a**2*x**2 + 1)/1500625 - a**2*c**3*x**3*
asin(a*x)**3 + 1514*a**2*c**3*x**3*asin(a*x)/3675 - 757*a*c**3*x**2*sqrt(-a
**2*x**2 + 1)*asin(a*x)**2/1225 + 1495874*a*c**3*x**2*sqrt(-a**2*x**2 + 1)/
13505625 + c**3*x*asin(a*x)**3 - 4322*c**3*x*asin(a*x)/1225 + 2161*c**3*sqr
t(-a**2*x**2 + 1)*asin(a*x)**2/(1225*a) - 44658302*c**3*sqrt(-a**2*x**2 + 1
)/(13505625*a), Ne(a, 0)), (0, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 284, normalized size of antiderivative = 0.77

$$\int \left(c-a^2cx^2\right)^3 \arcsin(ax)^3\,dx =$$
$$-\frac{1}{1225}\left(75\sqrt{-a^2x^2+1}a^4c^3x^6 - 351\sqrt{-a^2x^2+1}a^2c^3x^4 + 757\sqrt{-a^2x^2+1}c^3x^2 - \frac{2161\sqrt{-a^2x^2+1}c^3}{a^2}\right)a$$
$$-\frac{1}{35}\left(5a^6c^3x^7 - 21a^4c^3x^5 + 35a^2c^3x^3 - 35c^3x\right)\arcsin(ax)^3$$
$$+\frac{2}{13505625}\left(16875\sqrt{-a^2x^2+1}a^4c^3x^6 - 134541\sqrt{-a^2x^2+1}a^2c^3x^4 + 747937\sqrt{-a^2x^2+1}c^3x^2 - \frac{223291}{}\right.$$

```
[In] integrate((-a^2*c*x^2+c)^3*arcsin(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/1225*(75*sqrt(-a^2*x^2 + 1)*a^4*c^3*x^6 - 351*sqrt(-a^2*x^2 + 1)*a^2*c^3
*x^4 + 757*sqrt(-a^2*x^2 + 1)*c^3*x^2 - 2161*sqrt(-a^2*x^2 + 1)*c^3/a^2)*a*
arcsin(a*x)^2 - 1/35*(5*a^6*c^3*x^7 - 21*a^4*c^3*x^5 + 35*a^2*c^3*x^3 - 35*
c^3*x)*arcsin(a*x)^3 + 2/13505625*(16875*sqrt(-a^2*x^2 + 1)*a^4*c^3*x^6 - 1
34541*sqrt(-a^2*x^2 + 1)*a^2*c^3*x^4 + 747937*sqrt(-a^2*x^2 + 1)*c^3*x^2 -
22329151*sqrt(-a^2*x^2 + 1)*c^3/a^2 + 105*(1125*a^6*c^3*x^7 - 7371*a^4*c^3*
x^5 + 26495*a^2*c^3*x^3 - 226905*c^3*x)*arcsin(a*x)/a)*a
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 379, normalized size of antiderivative = 1.02

$$\int \left(c-a^2cx^2\right)^3 \arcsin(ax)^3\,dx = -\frac{1}{7}\left(a^2x^2-1\right)^3c^3x\arcsin\left(ax\right)^3 + \frac{6}{35}\left(a^2x^2-1\right)^2c^3x\arcsin\left(ax\right)^3 + \frac{6}{343}\left(a^2x^2-1\right)^3c^3x\arcsin\left(ax\right) - \frac{8}{35}\left(a^2x^2-1\right)c^3x\arcsin\left(ax\right)^3 - \frac{3\left(a^2x^2-1\right)^3\sqrt{-a^2x^2+1}c^3\arcsin\left(ax\right)^2}{49\,a} - \frac{2664}{42875}\left(a^2x^2-1\right)^2c^3x\arcsin\left(ax\right) + \frac{16}{35}c^3x\arcsin\left(ax\right)^3 + \frac{18\left(a^2x^2-1\right)^2\sqrt{-a^2x^2+1}c^3\arcsin\left(ax\right)^2}{175\,a} + \frac{30256}{128625}\left(a^2x^2-1\right)c^3x\arcsin\left(ax\right) + \frac{6\left(a^2x^2-1\right)^3\sqrt{-a^2x^2+1}c^3}{2401\,a} + \frac{8\left(-a^2x^2+1\right)^{\frac{3}{2}}c^3\arcsin\left(ax\right)^2}{35\,a} - \frac{413312}{128625}c^3x\arcsin\left(ax\right) - \frac{2664\left(a^2x^2-1\right)^2\sqrt{-a^2x^2+1}c^3}{214375\,a} + \frac{48\sqrt{-a^2x^2+1}c^3\arcsin\left(ax\right)^2}{35\,a} - \frac{30256\left(-a^2x^2+1\right)^{\frac{3}{2}}c^3}{385875\,a} - \frac{413312\sqrt{-a^2x^2+1}c^3}{128625\,a}$$

```
[In] integrate((-a^2*c*x^2+c)^3*arcsin(a*x)^3,x, algorithm="giac")
```

```
[Out] -1/7*(a^2*x^2 - 1)^3*c^3*x*arcsin(a*x)^3 + 6/35*(a^2*x^2 - 1)^2*c^3*x*arcsi
n(a*x)^3 + 6/343*(a^2*x^2 - 1)^3*c^3*x*arcsin(a*x) - 8/35*(a^2*x^2 - 1)*c^3
*x*arcsin(a*x)^3 - 3/49*(a^2*x^2 - 1)^3*sqrt(-a^2*x^2 + 1)*c^3*arcsin(a*x)^
2/a - 2664/42875*(a^2*x^2 - 1)^2*c^3*x*arcsin(a*x) + 16/35*c^3*x*arcsin(a*x
)^3 + 18/175*(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)*c^3*arcsin(a*x)^2/a + 30256
/128625*(a^2*x^2 - 1)*c^3*x*arcsin(a*x) + 6/2401*(a^2*x^2 - 1)^3*sqrt(-a^2*
x^2 + 1)*c^3/a + 8/35*(-a^2*x^2 + 1)^(3/2)*c^3*arcsin(a*x)^2/a - 413312/128
625*c^3*x*arcsin(a*x) - 2664/214375*(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)*c^3/
a + 48/35*sqrt(-a^2*x^2 + 1)*c^3*arcsin(a*x)^2/a - 30256/385875*(-a^2*x^2 +
 1)^(3/2)*c^3/a - 413312/128625*sqrt(-a^2*x^2 + 1)*c^3/a
```

Mupad [F(-1)]

Timed out.

$$\int \left(c-a^2cx^2\right)^3\arcsin(ax)^3\,dx=\int \mathrm{asin}(a\,x)^3\,\left(c-a^2\,c\,x^2\right)^3\,dx$$

```
[In] int(asin(a*x)^3*(c - a^2*c*x^2)^3,x)
[Out] int(asin(a*x)^3*(c - a^2*c*x^2)^3, x)
```

3.290 $\int (c-a^2cx^2)^2 \arcsin(ax)^3 \, dx$

Optimal result

Integrand size = 20, antiderivative size = 273

$$\begin{aligned}
&\int (c-a^2cx^2)^2 \arcsin(ax)^3 \, dx \\
&= -\frac{4144c^2\sqrt{1-a^2x^2}}{1125a} - \frac{272c^2(1-a^2x^2)^{3/2}}{3375a} - \frac{6c^2(1-a^2x^2)^{5/2}}{625a} - \frac{298}{75}c^2x\arcsin(ax) \\
&\quad + \frac{76}{225}a^2c^2x^3\arcsin(ax) - \frac{6}{125}a^4c^2x^5\arcsin(ax) + \frac{8c^2\sqrt{1-a^2x^2}\arcsin(ax)^2}{5a} \\
&\quad + \frac{4c^2(1-a^2x^2)^{3/2}\arcsin(ax)^2}{15a} + \frac{3c^2(1-a^2x^2)^{5/2}\arcsin(ax)^2}{25a} \\
&\quad + \frac{8}{15}c^2x\arcsin(ax)^3 + \frac{4}{15}c^2x(1-a^2x^2)\arcsin(ax)^3 + \frac{1}{5}c^2x(1-a^2x^2)^2\arcsin(ax)^3
\end{aligned}$$

```
[Out] -272/3375*c^2*(-a^2*x^2+1)^(3/2)/a-6/625*c^2*(-a^2*x^2+1)^(5/2)/a-298/75*c^
2*x*arcsin(a*x)+76/225*a^2*c^2*x^3*arcsin(a*x)-6/125*a^4*c^2*x^5*arcsin(a*x
)+4/15*c^2*(-a^2*x^2+1)^(3/2)*arcsin(a*x)^2/a+3/25*c^2*(-a^2*x^2+1)^(5/2)*a
rcsin(a*x)^2/a+8/15*c^2*x*arcsin(a*x)^3+4/15*c^2*x*(-a^2*x^2+1)*arcsin(a*x)
^3+1/5*c^2*x*(-a^2*x^2+1)^2*arcsin(a*x)^3-4144/1125*c^2*(-a^2*x^2+1)^(1/2)/
a+8/5*c^2*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)/a
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.550, Rules used = {4743, 4715, 4767, 267, 4739, 455, 45, 200, 12, 1261, 712}

$$\int (c-a^2cx^2)^2 \arcsin(ax)^3 \, dx = -\frac{6}{125}a^4c^2x^5\arcsin(ax)+\frac{76}{225}a^2c^2x^3\arcsin(ax) +\frac{1}{5}c^2x(1-a^2x^2)^2\arcsin(ax)^3 +\frac{4}{15}c^2x(1-a^2x^2)\arcsin(ax)^3 +\frac{3c^2(1-a^2x^2)^{5/2}\arcsin(ax)^2}{25a} +\frac{4c^2(1-a^2x^2)^{3/2}\arcsin(ax)^2}{15a} +\frac{8c^2\sqrt{1-a^2x^2}\arcsin(ax)^2}{5a}-\frac{6c^2(1-a^2x^2)^{5/2}}{625a} -\frac{272c^2(1-a^2x^2)^{3/2}}{3375a}-\frac{4144c^2\sqrt{1-a^2x^2}}{1125a} +\frac{8}{15}c^2x\arcsin(ax)^3-\frac{298}{75}c^2x\arcsin(ax)$$

```
[In] Int[(c - a^2*c*x^2)^2*ArcSin[a*x]^3,x]
```

```
[Out] (-4144*c^2*Sqrt[1 - a^2*x^2])/(1125*a) - (272*c^2*(1 - a^2*x^2)^(3/2))/(337
5*a) - (6*c^2*(1 - a^2*x^2)^(5/2))/(625*a) - (298*c^2*x*ArcSin[a*x])/75 + (
76*a^2*c^2*x^3*ArcSin[a*x])/225 - (6*a^4*c^2*x^5*ArcSin[a*x])/125 + (8*c^2*
Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2)/(5*a) + (4*c^2*(1 - a^2*x^2)^(3/2)*ArcSin[
a*x]^2)/(15*a) + (3*c^2*(1 - a^2*x^2)^(5/2)*ArcSin[a*x]^2)/(25*a) + (8*c^2*
x*ArcSin[a*x]^3)/15 + (4*c^2*x*(1 - a^2*x^2)*ArcSin[a*x]^3)/15 + (c^2*x*(1
- a^2*x^2)^2*ArcSin[a*x]^3)/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
```

```
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{5}c^2x\left(1-a^2x^2\right)^2\arcsin(ax)^3+\frac{1}{5}(4c)\int\left(c-a^2cx^2\right)\arcsin(ax)^3\,dx \\
&\quad -\frac{1}{5}\left(3ac^2\right)\int x\left(1-a^2x^2\right)^{3/2}\arcsin(ax)^2\,dx \\
&= \frac{3c^2(1-a^2x^2)^{5/2}\arcsin(ax)^2}{25a}+\frac{4}{15}c^2x\left(1-a^2x^2\right)\arcsin(ax)^3 \\
&\quad +\frac{1}{5}c^2x\left(1-a^2x^2\right)^2\arcsin(ax)^3-\frac{1}{25}\left(6c^2\right)\int\left(1-a^2x^2\right)^2\arcsin(ax)\,dx \\
&\quad +\frac{1}{15}\left(8c^2\right)\int\arcsin(ax)^3\,dx-\frac{1}{5}\left(4ac^2\right)\int x\sqrt{1-a^2x^2}\arcsin(ax)^2\,dx \\
&= -\frac{6}{25}c^2x\arcsin(ax)+\frac{4}{25}a^2c^2x^3\arcsin(ax)-\frac{6}{125}a^4c^2x^5\arcsin(ax) \\
&\quad +\frac{4c^2(1-a^2x^2)^{3/2}\arcsin(ax)^2}{15a}+\frac{3c^2(1-a^2x^2)^{5/2}\arcsin(ax)^2}{25a} \\
&\quad +\frac{8}{15}c^2x\arcsin(ax)^3+\frac{4}{15}c^2x\left(1-a^2x^2\right)\arcsin(ax)^3 \\
&\quad +\frac{1}{5}c^2x\left(1-a^2x^2\right)^2\arcsin(ax)^3-\frac{1}{15}\left(8c^2\right)\int\left(1-a^2x^2\right)\arcsin(ax)\,dx \\
&\quad +\frac{1}{25}\left(6ac^2\right)\int\frac{x(15-10a^2x^2+3a^4x^4)}{15\sqrt{1-a^2x^2}}\,dx-\frac{1}{5}\left(8ac^2\right)\int\frac{x\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx
\end{aligned}$$

$$= -\frac{58}{75}c^2x\arcsin(ax) + \frac{76}{225}a^2c^2x^3\arcsin(ax) - \frac{6}{125}a^4c^2x^5\arcsin(ax) + \frac{8c^2\sqrt{1-a^2x^2}\arcsin(ax)^2}{5a} + \frac{4c^2(1-a^2x^2)^{3/2}\arcsin(ax)^2}{15a} + \frac{3c^2(1-a^2x^2)^{5/2}\arcsin(ax)^2}{25a} + \frac{8}{15}c^2x\arcsin(ax)^3 + \frac{4}{15}c^2x(1-a^2x^2)\arcsin(ax)^3 + \frac{1}{5}c^2x(1-a^2x^2)^2\arcsin(ax)^3 - \frac{1}{5}(16c^2)\int\arcsin(ax)\,dx + \frac{1}{125}(2ac^2)\int\frac{x(15-10a^2x^2+3a^4x^4)}{\sqrt{1-a^2x^2}}\,dx + \frac{1}{15}(8ac^2)\int\frac{x\left(1-\frac{a^2x^2}{3}\right)}{\sqrt{1-a^2x^2}}\,dx$$

$$= -\frac{298}{75}c^2x\arcsin(ax) + \frac{76}{225}a^2c^2x^3\arcsin(ax) - \frac{6}{125}a^4c^2x^5\arcsin(ax) + \frac{8c^2\sqrt{1-a^2x^2}\arcsin(ax)^2}{5a} + \frac{4c^2(1-a^2x^2)^{3/2}\arcsin(ax)^2}{15a} + \frac{3c^2(1-a^2x^2)^{5/2}\arcsin(ax)^2}{25a} + \frac{8}{15}c^2x\arcsin(ax)^3 + \frac{4}{15}c^2x(1-a^2x^2)\arcsin(ax)^3 + \frac{1}{5}c^2x(1-a^2x^2)^2\arcsin(ax)^3 + \frac{1}{125}(ac^2)\,\mathrm{Subst}\left(\int\frac{15-10a^2x+3a^4x^2}{\sqrt{1-a^2x}}\,dx, x, x^2\right) + \frac{1}{15}(4ac^2)\,\mathrm{Subst}\left(\int\frac{1-\frac{a^2x}{3}}{\sqrt{1-a^2x}}\,dx, x, x^2\right) + \frac{1}{5}(16ac^2)\int\frac{x}{\sqrt{1-a^2x^2}}\,dx$$

$$= -\frac{16c^2\sqrt{1-a^2x^2}}{5a} - \frac{298}{75}c^2x\arcsin(ax) + \frac{76}{225}a^2c^2x^3\arcsin(ax) - \frac{6}{125}a^4c^2x^5\arcsin(ax) + \frac{8c^2\sqrt{1-a^2x^2}\arcsin(ax)^2}{5a} + \frac{4c^2(1-a^2x^2)^{3/2}\arcsin(ax)^2}{15a} + \frac{3c^2(1-a^2x^2)^{5/2}\arcsin(ax)^2}{25a} + \frac{8}{15}c^2x\arcsin(ax)^3 + \frac{4}{15}c^2x(1-a^2x^2)\arcsin(ax)^3 + \frac{1}{5}c^2x(1-a^2x^2)^2\arcsin(ax)^3 + \frac{1}{125}(ac^2)\,\mathrm{Subst}\left(\int\left(\frac{8}{\sqrt{1-a^2x}}+4\sqrt{1-a^2x}+3(1-a^2x)^{3/2}\right)dx, x, x^2\right) + \frac{1}{15}(4ac^2)\,\mathrm{Subst}\Bigg(\int$$

$$= -\frac{4144c^2\sqrt{1-a^2x^2}}{1125a} - \frac{272c^2(1-a^2x^2)^{3/2}}{3375a} - \frac{6c^2(1-a^2x^2)^{5/2}}{625a} - \frac{298}{75}c^2x\arcsin(ax) + \frac{76}{225}a^2c^2x^3\arcsin(ax) - \frac{6}{125}a^4c^2x^5\arcsin(ax) + \frac{8c^2\sqrt{1-a^2x^2}\arcsin(ax)^2}{5a} + \frac{4c^2(1-a^2x^2)^{3/2}\arcsin(ax)^2}{15a} + \frac{3c^2(1-a^2x^2)^{5/2}\arcsin(ax)^2}{25a} + \frac{8}{15}c^2x\arcsin(ax)^3 + \frac{4}{15}c^2x(1-a^2x^2)\arcsin(ax)^3 + \frac{1}{5}c^2x(1-a^2x^2)^2\arcsin(ax)^3$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 139, normalized size of antiderivative = 0.51

$$\int (c-a^2cx^2)^2 \arcsin(ax)^3\,dx$$
$$= \frac{c^2\left(-2\sqrt{1-a^2x^2}(31841-842a^2x^2+81a^4x^4)-30ax(2235-190a^2x^2+27a^4x^4)\arcsin(ax)+225\sqrt{1-a^2x^2}\right.}{16875a}$$

```
[In] Integrate[(c - a^2*c*x^2)^2*ArcSin[a*x]^3,x]
```

```
[Out] (c^2*(-2*Sqrt[1 - a^2*x^2]*(31841 - 842*a^2*x^2 + 81*a^4*x^4) - 30*a*x*(223
5 - 190*a^2*x^2 + 27*a^4*x^4)*ArcSin[a*x] + 225*Sqrt[1 - a^2*x^2]*(149 - 38
*a^2*x^2 + 9*a^4*x^4)*ArcSin[a*x]^2 + 1125*a*x*(15 - 10*a^2*x^2 + 3*a^4*x^4
)*ArcSin[a*x]^3))/(16875*a)
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 206, normalized size of antiderivative = 0.75

method	result
derivativedivides	$\frac{c^2\left(3375a^5x^5\arcsin(ax)^3+2025\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^4x^4-11250a^3x^3\arcsin(ax)^3-810a^5x^5\arcsin(ax)-8550\arcsin(\right.}{}$
default	$\frac{c^2\left(3375a^5x^5\arcsin(ax)^3+2025\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^4x^4-11250a^3x^3\arcsin(ax)^3-810a^5x^5\arcsin(ax)-8550\arcsin(\right.}{}$

```
[In] int((-a^2*c*x^2+c)^2*arcsin(a*x)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/16875/a*c^2*(3375*a^5*x^5*arcsin(a*x)^3+2025*arcsin(a*x)^2*(-a^2*x^2+1)^(
1/2)*a^4*x^4-11250*a^3*x^3*arcsin(a*x)^3-810*a^5*x^5*arcsin(a*x)-8550*arcsi
n(a*x)^2*(-a^2*x^2+1)^(1/2)*a^2*x^2-162*a^4*x^4*(-a^2*x^2+1)^(1/2)+16875*a*
x*arcsin(a*x)^3+5700*a^3*x^3*arcsin(a*x)+33525*arcsin(a*x)^2*(-a^2*x^2+1)^(
1/2)+1684*a^2*x^2*(-a^2*x^2+1)^(1/2)-67050*a*x*arcsin(a*x)-63682*(-a^2*x^2+
1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 158, normalized size of antiderivative = 0.58

$$\int (c-a^2cx^2)^2 \arcsin(ax)^3\,dx$$
$$= \frac{1125\left(3\,a^5c^2x^5-10\,a^3c^2x^3+15\,ac^2x\right)\arcsin(ax)^3-30\left(27\,a^5c^2x^5-190\,a^3c^2x^3+2235\,ac^2x\right)\arcsin(ax)-}{16875}$$

```
[In] integrate((-a^2*c*x^2+c)^2*arcsin(a*x)^3,x, algorithm="fricas")
```

```
[Out] 1/16875*(1125*(3*a^5*c^2*x^5 - 10*a^3*c^2*x^3 + 15*a*c^2*x)*arcsin(a*x)^3 -
 30*(27*a^5*c^2*x^5 - 190*a^3*c^2*x^3 + 2235*a*c^2*x)*arcsin(a*x) - (162*a^
4*c^2*x^4 - 1684*a^2*c^2*x^2 - 225*(9*a^4*c^2*x^4 - 38*a^2*c^2*x^2 + 149*c^
2)*arcsin(a*x)^2 + 63682*c^2)*sqrt(-a^2*x^2 + 1))/a
```

Sympy [A] (verification not implemented)

Time = 0.58 (sec) , antiderivative size = 262, normalized size of antiderivative = 0.96

$$\int \left(c-a^2cx^2\right)^2 \arcsin(ax)^3\,dx$$
$$= \begin{cases} \frac{a^4c^2x^5 \operatorname{asin}^3(ax)}{5} - \frac{6a^4c^2x^5 \operatorname{asin}(ax)}{125} + \frac{3a^3c^2x^4\sqrt{-a^2x^2+1}\operatorname{asin}^2(ax)}{25} - \frac{6a^3c^2x^4\sqrt{-a^2x^2+1}}{625} - \frac{2a^2c^2x^3\operatorname{asin}^3(ax)}{3} + \frac{76a^2c^2x^3\operatorname{asin}}{225} \\ 0 \end{cases}$$

```
[In] integrate((-a**2*c*x**2+c)**2*asin(a*x)**3,x)
```

```
[Out] Piecewise((a**4*c**2*x**5*asin(a*x)**3/5 - 6*a**4*c**2*x**5*asin(a*x)/125 +
 3*a**3*c**2*x**4*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/25 - 6*a**3*c**2*x**4*s
qrt(-a**2*x**2 + 1)/625 - 2*a**2*c**2*x**3*asin(a*x)**3/3 + 76*a**2*c**2*x*
*3*asin(a*x)/225 - 38*a*c**2*x**2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/75 + 16
84*a*c**2*x**2*sqrt(-a**2*x**2 + 1)/16875 + c**2*x*asin(a*x)**3 - 298*c**2*
x*asin(a*x)/75 + 149*c**2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/(75*a) - 63682*
c**2*sqrt(-a**2*x**2 + 1)/(16875*a), Ne(a, 0)), (0, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 216, normalized size of antiderivative = 0.79

$$\int \left(c-a^2cx^2\right)^2 \arcsin(ax)^3\,dx$$
$$= \frac{1}{75}\left(9\sqrt{-a^2x^2+1}a^2c^2x^4 - 38\sqrt{-a^2x^2+1}c^2x^2 + \frac{149\sqrt{-a^2x^2+1}c^2}{a^2}\right)a\arcsin(ax)^2$$
$$+ \frac{1}{15}\left(3a^4c^2x^5 - 10a^2c^2x^3 + 15c^2x\right)\arcsin(ax)^3$$
$$- \frac{2}{16875}\left(81\sqrt{-a^2x^2+1}a^2c^2x^4 - 842\sqrt{-a^2x^2+1}c^2x^2 + \frac{15\left(27a^4c^2x^5 - 190a^2c^2x^3 + 2235c^2x\right)\arcsin(}{a}\right.$$

```
[In] integrate((-a^2*c*x^2+c)^2*arcsin(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/75*(9*sqrt(-a^2*x^2 + 1)*a^2*c^2*x^4 - 38*sqrt(-a^2*x^2 + 1)*c^2*x^2 + 14
9*sqrt(-a^2*x^2 + 1)*c^2/a^2)*a*arcsin(a*x)^2 + 1/15*(3*a^4*c^2*x^5 - 10*a^
2*c^2*x^3 + 15*c^2*x)*arcsin(a*x)^3 - 2/16875*(81*sqrt(-a^2*x^2 + 1)*a^2*c^
2*x^4 - 842*sqrt(-a^2*x^2 + 1)*c^2*x^2 + 15*(27*a^4*c^2*x^5 - 190*a^2*c^2*x
^3 + 2235*c^2*x)*arcsin(a*x)/a + 31841*sqrt(-a^2*x^2 + 1)*c^2/a^2)*a
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 267, normalized size of antiderivative = 0.98

$$\int \left(c-a^2cx^2\right)^2 \arcsin(ax)^3\,dx = \frac{1}{5}\left(a^2x^2-1\right)^2c^2x\arcsin\left(ax\right)^3 - \frac{4}{15}\left(a^2x^2-1\right)c^2x\arcsin\left(ax\right)^3 - \frac{6}{125}\left(a^2x^2-1\right)^2c^2x\arcsin\left(ax\right) + \frac{8}{15}c^2x\arcsin\left(ax\right)^3 + \frac{3\left(a^2x^2-1\right)^2\sqrt{-a^2x^2+1}c^2\arcsin\left(ax\right)^2}{25\,a} + \frac{272}{1125}\left(a^2x^2-1\right)c^2x\arcsin\left(ax\right) + \frac{4\left(-a^2x^2+1\right)^{\frac{3}{2}}c^2\arcsin\left(ax\right)^2}{15\,a} - \frac{4144}{1125}c^2x\arcsin\left(ax\right) - \frac{6\left(a^2x^2-1\right)^2\sqrt{-a^2x^2+1}c^2}{625\,a} + \frac{8\sqrt{-a^2x^2+1}c^2\arcsin\left(ax\right)^2}{5\,a} - \frac{272\left(-a^2x^2+1\right)^{\frac{3}{2}}c^2}{3375\,a} - \frac{4144\sqrt{-a^2x^2+1}c^2}{1125\,a}$$

```
[In] integrate((-a^2*c*x^2+c)^2*arcsin(a*x)^3,x, algorithm="giac")
```

```
[Out] 1/5*(a^2*x^2 - 1)^2*c^2*x*arcsin(a*x)^3 - 4/15*(a^2*x^2 - 1)*c^2*x*arcsin(a
*x)^3 - 6/125*(a^2*x^2 - 1)^2*c^2*x*arcsin(a*x) + 8/15*c^2*x*arcsin(a*x)^3
+ 3/25*(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)*c^2*arcsin(a*x)^2/a + 272/1125*(a
^2*x^2 - 1)*c^2*x*arcsin(a*x) + 4/15*(-a^2*x^2 + 1)^(3/2)*c^2*arcsin(a*x)^2
/a - 4144/1125*c^2*x*arcsin(a*x) - 6/625*(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)
*c^2/a + 8/5*sqrt(-a^2*x^2 + 1)*c^2*arcsin(a*x)^2/a - 272/3375*(-a^2*x^2 +
1)^(3/2)*c^2/a - 4144/1125*sqrt(-a^2*x^2 + 1)*c^2/a
```

Mupad [F(-1)]

Timed out.

$$\int \left(c-a^2cx^2\right)^2 \arcsin(ax)^3\,dx = \int \mathrm{asin}(a\,x)^3\,\left(c-a^2\,c\,x^2\right)^2\,dx$$

```
[In] int(asin(a*x)^3*(c - a^2*c*x^2)^2,x)
[Out] int(asin(a*x)^3*(c - a^2*c*x^2)^2, x)
```

3.291 $\int (c-a^2cx^2) \arcsin(ax)^3 \, dx$

Optimal result

Integrand size = 18, antiderivative size = 158

$$\int (c-a^2cx^2) \arcsin(ax)^3 \, dx = -\frac{40c\sqrt{1-a^2x^2}}{9a} - \frac{2c(1-a^2x^2)^{3/2}}{27a} - \frac{14}{3}cx \arcsin(ax) + \frac{2}{9}a^2cx^3 \arcsin(ax) + \frac{2c\sqrt{1-a^2x^2} \arcsin(ax)^2}{a} + \frac{c(1-a^2x^2)^{3/2} \arcsin(ax)^2}{3a} + \frac{2}{3}cx \arcsin(ax)^3 + \frac{1}{3}cx(1-a^2x^2) \arcsin(ax)^3$$

```
[Out] -2/27*c*(-a^2*x^2+1)^(3/2)/a-14/3*c*x*arcsin(a*x)+2/9*a^2*c*x^3*arcsin(a*x)
+1/3*c*(-a^2*x^2+1)^(3/2)*arcsin(a*x)^2/a+2/3*c*x*arcsin(a*x)^3+1/3*c*x*(-a
^2*x^2+1)*arcsin(a*x)^3-40/9*c*(-a^2*x^2+1)^(1/2)/a+2*c*arcsin(a*x)^2*(-a^2
*x^2+1)^(1/2)/a
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used = {4743, 4715, 4767, 267, 4739, 455, 45}

$$\int (c-a^2cx^2) \arcsin(ax)^3 \, dx = \frac{2}{9}a^2cx^3 \arcsin(ax) + \frac{1}{3}cx(1-a^2x^2) \arcsin(ax)^3 + \frac{c(1-a^2x^2)^{3/2} \arcsin(ax)^2}{3a} + \frac{2c\sqrt{1-a^2x^2} \arcsin(ax)^2}{a} - \frac{2c(1-a^2x^2)^{3/2}}{27a} - \frac{40c\sqrt{1-a^2x^2}}{9a} + \frac{2}{3}cx \arcsin(ax)^3 - \frac{14}{3}cx \arcsin(ax)$$

```
[In] Int[(c - a^2*c*x^2)*ArcSin[a*x]^3,x]
```

```
[Out] (-40*c*Sqrt[1 - a^2*x^2])/(9*a) - (2*c*(1 - a^2*x^2)^(3/2))/(27*a) - (14*c*
x*ArcSin[a*x])/3 + (2*a^2*c*x^3*ArcSin[a*x])/9 + (2*c*Sqrt[1 - a^2*x^2]*Arc
Sin[a*x]^2)/a + (c*(1 - a^2*x^2)^(3/2)*ArcSin[a*x]^2)/(3*a) + (2*c*x*ArcSin
[a*x]^3)/3 + (c*x*(1 - a^2*x^2)*ArcSin[a*x]^3)/3
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
```

```
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{3}cx\left(1-a^2x^2\right)\arcsin(ax)^3+\frac{1}{3}(2c)\int \arcsin(ax)^3\,dx \\
&\quad -(ac)\int x\sqrt{1-a^2x^2}\arcsin(ax)^2\,dx \\
&= \frac{c\left(1-a^2x^2\right)^{3/2}\arcsin(ax)^2}{3a}+\frac{2}{3}cx\arcsin(ax)^3+\frac{1}{3}cx\left(1-a^2x^2\right)\arcsin(ax)^3 \\
&\quad -\frac{1}{3}(2c)\int \left(1-a^2x^2\right)\arcsin(ax)\,dx-(2ac)\int \frac{x\arcsin(ax)^2}{\sqrt{1-a^2x^2}}\,dx \\
&= -\frac{2}{3}cx\arcsin(ax)+\frac{2}{9}a^2cx^3\arcsin(ax)+\frac{2c\sqrt{1-a^2x^2}\arcsin(ax)^2}{a} \\
&\quad +\frac{c\left(1-a^2x^2\right)^{3/2}\arcsin(ax)^2}{3a}+\frac{2}{3}cx\arcsin(ax)^3+\frac{1}{3}cx\left(1-a^2x^2\right)\arcsin(ax)^3 \\
&\quad -(4c)\int \arcsin(ax)\,dx+\frac{1}{3}(2ac)\int \frac{x\left(1-\frac{a^2x^2}{3}\right)}{\sqrt{1-a^2x^2}}\,dx \\
&= -\frac{14}{3}cx\arcsin(ax)+\frac{2}{9}a^2cx^3\arcsin(ax)+\frac{2c\sqrt{1-a^2x^2}\arcsin(ax)^2}{a} \\
&\quad +\frac{c\left(1-a^2x^2\right)^{3/2}\arcsin(ax)^2}{3a}+\frac{2}{3}cx\arcsin(ax)^3+\frac{1}{3}cx\left(1-a^2x^2\right)\arcsin(ax)^3 \\
&\quad +\frac{1}{3}(ac)\text{Subst}\left(\int \frac{1-\frac{a^2x}{3}}{\sqrt{1-a^2x}}\,dx,x,x^2\right)+(4ac)\int \frac{x}{\sqrt{1-a^2x^2}}\,dx \\
&= -\frac{4c\sqrt{1-a^2x^2}}{a}-\frac{14}{3}cx\arcsin(ax)+\frac{2}{9}a^2cx^3\arcsin(ax)+\frac{2c\sqrt{1-a^2x^2}\arcsin(ax)^2}{a} \\
&\quad +\frac{c\left(1-a^2x^2\right)^{3/2}\arcsin(ax)^2}{3a}+\frac{2}{3}cx\arcsin(ax)^3+\frac{1}{3}cx\left(1-a^2x^2\right)\arcsin(ax)^3 \\
&\quad +\frac{1}{3}(ac)\text{Subst}\left(\int \left(\frac{2}{3\sqrt{1-a^2x}}+\frac{1}{3}\sqrt{1-a^2x}\right)dx,x,x^2\right)
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{40c\sqrt{1-a^2x^2}}{9a} - \frac{2c(1-a^2x^2)^{3/2}}{27a} \\
&\quad - \frac{14}{3}cx\arcsin(ax) + \frac{2}{9}a^2cx^3\arcsin(ax) + \frac{2c\sqrt{1-a^2x^2}\arcsin(ax)^2}{a} \\
&\quad + \frac{c(1-a^2x^2)^{3/2}\arcsin(ax)^2}{3a} + \frac{2}{3}cx\arcsin(ax)^3 + \frac{1}{3}cx(1-a^2x^2)\arcsin(ax)^3
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 101, normalized size of antiderivative = 0.64

$$
\int (c-a^2cx^2)\arcsin(ax)^3\,dx
$$

$$
= \frac{c\left(2\sqrt{1-a^2x^2}(-61+a^2x^2)+6ax(-21+a^2x^2)\arcsin(ax)-9\sqrt{1-a^2x^2}(-7+a^2x^2)\arcsin(ax)^2-9ax(\cdots\right.}{27a}
$$

```
[In] Integrate[(c - a^2*c*x^2)*ArcSin[a*x]^3,x]
```

```
[Out] (c*(2*Sqrt[1 - a^2*x^2]*(-61 + a^2*x^2) + 6*a*x*(-21 + a^2*x^2)*ArcSin[a*x]
 - 9*Sqrt[1 - a^2*x^2]*(-7 + a^2*x^2)*ArcSin[a*x]^2 - 9*a*x*(-3 + a^2*x^2)*
ArcSin[a*x]^3))/(27*a)
```

Maple [A] (verified)

Time = 0.07 (sec) , antiderivative size = 132, normalized size of antiderivative = 0.84

method	result
derivativedivides	$-\frac{c\left(9a^3x^3\arcsin(ax)^3+9\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^2x^2-27ax\arcsin(ax)^3-6a^3x^3\arcsin(ax)-63\arcsin(ax)^2\sqrt{-a^2x^2+ \cdots}\right.}{27a}$
default	$-\frac{c\left(9a^3x^3\arcsin(ax)^3+9\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^2x^2-27ax\arcsin(ax)^3-6a^3x^3\arcsin(ax)-63\arcsin(ax)^2\sqrt{-a^2x^2+ \cdots}\right.}{27a}$

```
[In] int((-a^2*c*x^2+c)*arcsin(a*x)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/27/a*c*(9*a^3*x^3*arcsin(a*x)^3+9*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^2*x
^2-27*a*x*arcsin(a*x)^3-6*a^3*x^3*arcsin(a*x)-63*arcsin(a*x)^2*(-a^2*x^2+1)
^(1/2)-2*a^2*x^2*(-a^2*x^2+1)^(1/2)+126*a*x*arcsin(a*x)+122*(-a^2*x^2+1)^(1
/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.60

$$\int (c - a^2cx^2) \arcsin(ax)^3 \, dx = -\frac{9\,(a^3cx^3 - 3\,acx)\arcsin(ax)^3 - 6\,(a^3cx^3 - 21\,acx)\arcsin(ax) - \left(2\,a^2cx^2 - 9\,(a^2cx^2 - 7\,c)\arcsin(ax)^2 -\right.}{27\,a}$$

```
[In] integrate((-a^2*c*x^2+c)*arcsin(a*x)^3,x, algorithm="fricas")
```

```
[Out] -1/27*(9*(a^3*c*x^3 - 3*a*c*x)*arcsin(a*x)^3 - 6*(a^3*c*x^3 - 21*a*c*x)*arc
sin(a*x) - (2*a^2*c*x^2 - 9*(a^2*c*x^2 - 7*c)*arcsin(a*x)^2 - 122*c)*sqrt(-
a^2*x^2 + 1))/a
```

Sympy [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 150, normalized size of antiderivative = 0.95

$$\int (c - a^2cx^2) \arcsin(ax)^3 \, dx = \begin{cases} -\frac{a^2cx^3 \operatorname{asin}^3(ax)}{3} + \frac{2a^2cx^3 \operatorname{asin}(ax)}{9} - \frac{acx^2\sqrt{-a^2x^2+1} \operatorname{asin}^2(ax)}{3} + \frac{2acx^2\sqrt{-a^2x^2+1}}{27} + cx \operatorname{asin}^3(ax) - \frac{14cx \operatorname{asin}(ax)}{3} + \frac{7c\sqrt{-}}{} \\ 0 \end{cases}$$

```
[In] integrate((-a**2*c*x**2+c)*asin(a*x)**3,x)
```

```
[Out] Piecewise((-a**2*c*x**3*asin(a*x)**3/3 + 2*a**2*c*x**3*asin(a*x)/9 - a*c*x*
*2*sqrt(-a**2*x**2 + 1)*asin(a*x)**2/3 + 2*a*c*x**2*sqrt(-a**2*x**2 + 1)/27
 + c*x*asin(a*x)**3 - 14*c*x*asin(a*x)/3 + 7*c*sqrt(-a**2*x**2 + 1)*asin(a*
x)**2/(3*a) - 122*c*sqrt(-a**2*x**2 + 1)/(27*a), Ne(a, 0)), (0, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 128, normalized size of antiderivative = 0.81

$$\begin{aligned}\int (c - a^2cx^2) \arcsin(ax)^3 \, dx &= -\frac{1}{3}\left(\sqrt{-a^2x^2+1}cx^2 - \frac{7\sqrt{-a^2x^2+1}c}{a^2}\right)a \arcsin(ax)^2 - \frac{1}{3}\left(a^2cx^3 - 3\,cx\right)\arcsin(ax)^3 \\ &\quad + \frac{2}{27}\left(\sqrt{-a^2x^2+1}cx^2 + \frac{3\,(a^2cx^3 - 21\,cx)\arcsin(ax)}{a} - \frac{61\sqrt{-a^2x^2+1}c}{a^2}\right)a\end{aligned}$$

```
[In] integrate((-a^2*c*x^2+c)*arcsin(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/3*(sqrt(-a^2*x^2 + 1)*c*x^2 - 7*sqrt(-a^2*x^2 + 1)*c/a^2)*a*arcsin(a*x)^
2 - 1/3*(a^2*c*x^3 - 3*c*x)*arcsin(a*x)^3 + 2/27*(sqrt(-a^2*x^2 + 1)*c*x^2
+ 3*(a^2*c*x^3 - 21*c*x)*arcsin(a*x)/a - 61*sqrt(-a^2*x^2 + 1)*c/a^2)*a
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 139, normalized size of antiderivative = 0.88

$$\int (c-a^2cx^2)\arcsin(ax)^3\,dx = -\frac{1}{3}\left(a^2x^2-1\right)cx\arcsin\left(ax\right)^3+\frac{2}{3}\,cx\arcsin\left(ax\right)^3 + \frac{2}{9}\left(a^2x^2-1\right)cx\arcsin\left(ax\right)+\frac{\left(-a^2x^2+1\right)^{\frac{3}{2}}c\arcsin\left(ax\right)^2}{3\,a} - \frac{40}{9}\,cx\arcsin\left(ax\right)+\frac{2\sqrt{-a^2x^2+1}c\arcsin\left(ax\right)^2}{a} - \frac{2\left(-a^2x^2+1\right)^{\frac{3}{2}}c}{27\,a}-\frac{40\sqrt{-a^2x^2+1}c}{9\,a}$$

```
[In] integrate((-a^2*c*x^2+c)*arcsin(a*x)^3,x, algorithm="giac")
```

```
[Out] -1/3*(a^2*x^2 - 1)*c*x*arcsin(a*x)^3 + 2/3*c*x*arcsin(a*x)^3 + 2/9*(a^2*x^2
 - 1)*c*x*arcsin(a*x) + 1/3*(-a^2*x^2 + 1)^(3/2)*c*arcsin(a*x)^2/a - 40/9*c
*x*arcsin(a*x) + 2*sqrt(-a^2*x^2 + 1)*c*arcsin(a*x)^2/a - 2/27*(-a^2*x^2 +
1)^(3/2)*c/a - 40/9*sqrt(-a^2*x^2 + 1)*c/a
```

Mupad [F(-1)]

Timed out.

$$\int (c-a^2cx^2)\arcsin(ax)^3\,dx = \int \mathrm{asin}(a\,x)^3\,\left(c-a^2\,c\,x^2\right)\,dx$$

```
[In] int(asin(a*x)^3*(c - a^2*c*x^2),x)
```

```
[Out] int(asin(a*x)^3*(c - a^2*c*x^2), x)
```

3.292 $\int \frac{\arcsin(ax)^3}{c-a^2cx^2}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 200

$$\int \frac{\arcsin(ax)^3}{c-a^2cx^2}\,dx = -\frac{2i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{ac} + \frac{3i\arcsin(ax)^2\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{ac} - \frac{3i\arcsin(ax)^2\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{ac} - \frac{6\arcsin(ax)\,\mathrm{PolyLog}\left(3,-ie^{i\arcsin(ax)}\right)}{ac} + \frac{6\arcsin(ax)\,\mathrm{PolyLog}\left(3,ie^{i\arcsin(ax)}\right)}{ac} - \frac{6i\,\mathrm{PolyLog}\left(4,-ie^{i\arcsin(ax)}\right)}{ac} + \frac{6i\,\mathrm{PolyLog}\left(4,ie^{i\arcsin(ax)}\right)}{ac}$$

```
[Out] -2*I*arcsin(a*x)^3*arctan(I*a*x+(-a^2*x^2+1)^(1/2))/a/c+3*I*arcsin(a*x)^2*p
olylog(2,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c-3*I*arcsin(a*x)^2*polylog(2,I*(
I*a*x+(-a^2*x^2+1)^(1/2)))/a/c-6*arcsin(a*x)*polylog(3,-I*(I*a*x+(-a^2*x^2+
1)^(1/2)))/a/c+6*arcsin(a*x)*polylog(3,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c-6*
I*polylog(4,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c+6*I*polylog(4,I*(I*a*x+(-a^2
*x^2+1)^(1/2)))/a/c
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 200, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {4749, 4266, 2611, 6744, 2320, 6724}

$$\int \frac{\arcsin(ax)^3}{c-a^2cx^2}\,dx = -\frac{2i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{ac} + \frac{3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{ac} - \frac{3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{ac} - \frac{6\arcsin(ax)\operatorname{PolyLog}\left(3,-ie^{i\arcsin(ax)}\right)}{ac} + \frac{6\arcsin(ax)\operatorname{PolyLog}\left(3,ie^{i\arcsin(ax)}\right)}{ac} - \frac{6i\operatorname{PolyLog}\left(4,-ie^{i\arcsin(ax)}\right)}{ac} + \frac{6i\operatorname{PolyLog}\left(4,ie^{i\arcsin(ax)}\right)}{ac}$$

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2),x]
```

```
[Out] ((-2*I)*ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])])/(a*c) + ((3*I)*ArcSin[a*x]
^2*PolyLog[2, (-I)*E^(I*ArcSin[a*x])])/(a*c) - ((3*I)*ArcSin[a*x]^2*PolyLog
[2, I*E^(I*ArcSin[a*x])])/(a*c) - (6*ArcSin[a*x]*PolyLog[3, (-I)*E^(I*ArcSi
n[a*x])])/(a*c) + (6*ArcSin[a*x]*PolyLog[3, I*E^(I*ArcSin[a*x])])/(a*c) - (
(6*I)*PolyLog[4, (-I)*E^(I*ArcSin[a*x])])/(a*c) + ((6*I)*PolyLog[4, I*E^(I*
ArcSin[a*x])])/(a*c)
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int x^3\sec(x)\,dx, x, \arcsin(ax)\right)}{ac}\\
&= -\frac{2i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{ac} - \frac{3\text{Subst}\left(\int x^2\log\left(1-ie^{ix}\right)\,dx, x, \arcsin(ax)\right)}{ac}\\
&\quad + \frac{3\text{Subst}\left(\int x^2\log\left(1+ie^{ix}\right)\,dx, x, \arcsin(ax)\right)}{ac}\\
&= -\frac{2i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{ac} + \frac{3i\arcsin(ax)^2\,\text{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{ac}\\
&\quad - \frac{3i\arcsin(ax)^2\,\text{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{ac}\\
&\quad - \frac{(6i)\text{Subst}\left(\int x\,\text{PolyLog}\left(2,-ie^{ix}\right)\,dx, x, \arcsin(ax)\right)}{ac}\\
&\quad + \frac{(6i)\text{Subst}\left(\int x\,\text{PolyLog}\left(2,ie^{ix}\right)\,dx, x, \arcsin(ax)\right)}{ac}
\end{aligned}$$

$$= -\frac{2i \arcsin(ax)^3 \arctan\left(e^{i\arcsin(ax)}\right)}{ac} + \frac{3i \arcsin(ax)^2 \operatorname{PolyLog}\left(2, -ie^{i\arcsin(ax)}\right)}{ac} - \frac{3i \arcsin(ax)^2 \operatorname{PolyLog}\left(2, ie^{i\arcsin(ax)}\right)}{ac} - \frac{6\arcsin(ax) \operatorname{PolyLog}\left(3, -ie^{i\arcsin(ax)}\right)}{ac} + \frac{6\arcsin(ax) \operatorname{PolyLog}\left(3, ie^{i\arcsin(ax)}\right)}{ac} + \frac{6\operatorname{Subst}\left(\int \operatorname{PolyLog}\left(3, -ie^{ix}\right)\, dx, x, \arcsin(ax)\right)}{ac} - \frac{6\operatorname{Subst}\left(\int \operatorname{PolyLog}\left(3, ie^{ix}\right)\, dx, x, \arcsin(ax)\right)}{ac}$$

$$= -\frac{2i \arcsin(ax)^3 \arctan\left(e^{i\arcsin(ax)}\right)}{ac} + \frac{3i \arcsin(ax)^2 \operatorname{PolyLog}\left(2, -ie^{i\arcsin(ax)}\right)}{ac} - \frac{3i \arcsin(ax)^2 \operatorname{PolyLog}\left(2, ie^{i\arcsin(ax)}\right)}{ac} - \frac{6\arcsin(ax) \operatorname{PolyLog}\left(3, -ie^{i\arcsin(ax)}\right)}{ac} + \frac{6\arcsin(ax) \operatorname{PolyLog}\left(3, ie^{i\arcsin(ax)}\right)}{ac} - \frac{(6i)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(3,-ix)}{x}\, dx, x, e^{i\arcsin(ax)}\right)}{ac} + \frac{(6i)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(3,ix)}{x}\, dx, x, e^{i\arcsin(ax)}\right)}{ac}$$

$$= -\frac{2i \arcsin(ax)^3 \arctan\left(e^{i\arcsin(ax)}\right)}{ac} + \frac{3i \arcsin(ax)^2 \operatorname{PolyLog}\left(2, -ie^{i\arcsin(ax)}\right)}{ac} - \frac{3i \arcsin(ax)^2 \operatorname{PolyLog}\left(2, ie^{i\arcsin(ax)}\right)}{ac} - \frac{6\arcsin(ax) \operatorname{PolyLog}\left(3, -ie^{i\arcsin(ax)}\right)}{ac} + \frac{6\arcsin(ax) \operatorname{PolyLog}\left(3, ie^{i\arcsin(ax)}\right)}{ac} - \frac{6i \operatorname{PolyLog}\left(4, -ie^{i\arcsin(ax)}\right)}{ac} + \frac{6i \operatorname{PolyLog}\left(4, ie^{i\arcsin(ax)}\right)}{ac}$$

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 162, normalized size of antiderivative = 0.81

$$\int \frac{\arcsin(ax)^3}{c - a^2cx^2}\, dx = -\frac{i\left(2\arcsin(ax)^3 \arctan\left(e^{i\arcsin(ax)}\right) - 3\arcsin(ax)^2 \operatorname{PolyLog}\left(2, -ie^{i\arcsin(ax)}\right) + 3\arcsin(ax)^2 \operatorname{PolyLog}\left(\right.\right.}{}$$

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2),x]
```

```
[Out] ((-I)*(2*ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])] - 3*ArcSin[a*x]^2*PolyLog[
2, (-I)*E^(I*ArcSin[a*x])] + 3*ArcSin[a*x]^2*PolyLog[2, I*E^(I*ArcSin[a*x])
```

```
] - (6*I)*ArcSin[a*x]*PolyLog[3, (-I)*E^(I*ArcSin[a*x])] + (6*I)*ArcSin[a*x
]*PolyLog[3, I*E^(I*ArcSin[a*x])] + 6*PolyLog[4, (-I)*E^(I*ArcSin[a*x])] -
6*PolyLog[4, I*E^(I*ArcSin[a*x])]))/(a*c)
```

Maple [F]

$$\int \frac{\arcsin(ax)^3}{-a^2c\,x^2+c}dx$$

[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c),x)

[Out] int(arcsin(a*x)^3/(-a^2*c*x^2+c),x)

Fricas [F]

$$\int \frac{\arcsin(ax)^3}{c-a^2cx^2}\,dx = \int -\frac{\arcsin(ax)^3}{a^2cx^2-c}\,dx$$

[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c),x, algorithm="fricas")

[Out] integral(-arcsin(a*x)^3/(a^2*c*x^2 - c), x)

Sympy [F]

$$\int \frac{\arcsin(ax)^3}{c-a^2cx^2}\,dx = -\frac{\int \frac{\operatorname{asin}^3(ax)}{a^2x^2-1}\,dx}{c}$$

[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c),x)

[Out] -Integral(asin(a*x)**3/(a**2*x**2 - 1), x)/c

Maxima [A] (verification not implemented)

none

Time = 0.43 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.18

$$\int \frac{\arcsin(ax)^3}{c-a^2cx^2}\,dx = \frac{1}{2}\left(\frac{\log(ax+1)}{ac}-\frac{\log(ax-1)}{ac}\right)\arcsin(ax)^3$$

[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c),x, algorithm="maxima")

[Out] 1/2*(log(a*x + 1)/(a*c) - log(a*x - 1)/(a*c))*arcsin(a*x)^3

Giac [F]

$$\int \frac{\arcsin(ax)^3}{c - a^2cx^2}\,dx = \int -\frac{\arcsin{(ax)}^3}{a^2cx^2 - c}\,dx$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c),x, algorithm="giac")
[Out] integrate(-arcsin(a*x)^3/(a^2*c*x^2 - c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^3}{c - a^2cx^2}\,dx = \int \frac{{\mathrm{asin}(a\,x)}^3}{c - a^2\,c\,x^2}\,dx$$

```
[In] int(asin(a*x)^3/(c - a^2*c*x^2),x)
[Out] int(asin(a*x)^3/(c - a^2*c*x^2), x)
```

3.293 $\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^2} dx$

Optimal result

Integrand size = 20, antiderivative size = 337

$$
\begin{aligned}
\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^2}\,dx = & -\frac{3\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)^3}{2c^2(1-a^2x^2)} - \frac{6i\arcsin(ax)\arctan\left(e^{i\arcsin(ax)}\right)}{ac^2} \\
& - \frac{i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{ac^2} + \frac{3i\,\text{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{ac^2} \\
& + \frac{3i\arcsin(ax)^2\,\text{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{2ac^2} \\
& - \frac{3i\,\text{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{ac^2} - \frac{3i\arcsin(ax)^2\,\text{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{2ac^2} \\
& - \frac{3\arcsin(ax)\,\text{PolyLog}\left(3,-ie^{i\arcsin(ax)}\right)}{ac^2} \\
& + \frac{3\arcsin(ax)\,\text{PolyLog}\left(3,ie^{i\arcsin(ax)}\right)}{ac^2} \\
& - \frac{3i\,\text{PolyLog}\left(4,-ie^{i\arcsin(ax)}\right)}{ac^2} + \frac{3i\,\text{PolyLog}\left(4,ie^{i\arcsin(ax)}\right)}{ac^2}
\end{aligned}
$$

```
[Out] 1/2*x*arcsin(a*x)^3/c^2/(-a^2*x^2+1)-6*I*arcsin(a*x)*arctan(I*a*x+(-a^2*x^2
+1)^(1/2))/a/c^2-I*arcsin(a*x)^3*arctan(I*a*x+(-a^2*x^2+1)^(1/2))/a/c^2+3*I
*polylog(2,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^2+3/2*I*arcsin(a*x)^2*polylog
(2,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^2-3*I*polylog(2,I*(I*a*x+(-a^2*x^2+1)
^(1/2)))/a/c^2-3/2*I*arcsin(a*x)^2*polylog(2,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/
a/c^2-3*arcsin(a*x)*polylog(3,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^2+3*arcsin
(a*x)*polylog(3,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^2-3*I*polylog(4,-I*(I*a*x
+(-a^2*x^2+1)^(1/2)))/a/c^2+3*I*polylog(4,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c
^2-3/2*arcsin(a*x)^2/a/c^2/(-a^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 337, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4747, 4749, 4266, 2611, 6744, 2320, 6724, 4767, 2317, 2438}

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^2}\,dx = \frac{x\arcsin(ax)^3}{2c^2(1-a^2x^2)} - \frac{3\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}} - \frac{i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{ac^2} - \frac{6i\arcsin(ax)\arctan\left(e^{i\arcsin(ax)}\right)}{ac^2} + \frac{3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{2ac^2} - \frac{3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{2ac^2} - \frac{3\arcsin(ax)\operatorname{PolyLog}\left(3,-ie^{i\arcsin(ax)}\right)}{ac^2} + \frac{3\arcsin(ax)\operatorname{PolyLog}\left(3,ie^{i\arcsin(ax)}\right)}{ac^2} + \frac{3i\operatorname{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{ac^2} - \frac{3i\operatorname{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{ac^2} - \frac{3i\operatorname{PolyLog}\left(4,-ie^{i\arcsin(ax)}\right)}{ac^2} + \frac{3i\operatorname{PolyLog}\left(4,ie^{i\arcsin(ax)}\right)}{ac^2}$$

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^2,x]
```

```
[Out] (-3*ArcSin[a*x]^2)/(2*a*c^2*Sqrt[1 - a^2*x^2]) + (x*ArcSin[a*x]^3)/(2*c^2*(
1 - a^2*x^2)) - ((6*I)*ArcSin[a*x]*ArcTan[E^(I*ArcSin[a*x])])/(a*c^2) - (I*
ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])])/(a*c^2) + ((3*I)*PolyLog[2, (-I)*E
^(I*ArcSin[a*x])])/(a*c^2) + (((3*I)/2)*ArcSin[a*x]^2*PolyLog[2, (-I)*E^(I*
ArcSin[a*x])])/(a*c^2) - ((3*I)*PolyLog[2, I*E^(I*ArcSin[a*x])])/(a*c^2) -
(((3*I)/2)*ArcSin[a*x]^2*PolyLog[2, I*E^(I*ArcSin[a*x])])/(a*c^2) - (3*ArcS
in[a*x]*PolyLog[3, (-I)*E^(I*ArcSin[a*x])])/(a*c^2) + (3*ArcSin[a*x]*PolyLo
g[3, I*E^(I*ArcSin[a*x])])/(a*c^2) - ((3*I)*PolyLog[4, (-I)*E^(I*ArcSin[a*x
])])/(a*c^2) + ((3*I)*PolyLog[4, I*E^(I*ArcSin[a*x])])/(a*c^2)
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
```

```
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
```

```
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x\arcsin(ax)^3}{2c^2(1-a^2x^2)} - \frac{(3a)\int \frac{x\arcsin(ax)^2}{(1-a^2x^2)^{3/2}}\,dx}{2c^2} + \frac{\int \frac{\arcsin(ax)^3}{c-a^2cx^2}\,dx}{2c} \\
&= -\frac{3\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)^3}{2c^2(1-a^2x^2)} + \frac{3\int \frac{\arcsin(ax)}{1-a^2x^2}\,dx}{c^2} + \frac{\text{Subst}\left(\int x^3\sec(x)\,dx, x, \arcsin(ax)\right)}{2ac^2} \\
&= -\frac{3\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)^3}{2c^2(1-a^2x^2)} - \frac{i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{ac^2} \\
&\quad - \frac{3\text{Subst}\left(\int x^2\log\left(1-ie^{ix}\right)\,dx, x, \arcsin(ax)\right)}{2ac^2} \\
&\quad + \frac{3\text{Subst}\left(\int x^2\log\left(1+ie^{ix}\right)\,dx, x, \arcsin(ax)\right)}{2ac^2} \\
&\quad + \frac{3\text{Subst}\left(\int x\sec(x)\,dx, x, \arcsin(ax)\right)}{ac^2}
\end{aligned}$$

$$= -\frac{3\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)^3}{2c^2(1-a^2x^2)} - \frac{6i\arcsin(ax)\arctan\left(e^{i\arcsin(ax)}\right)}{ac^2} - \frac{i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{ac^2} + \frac{3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{2ac^2} - \frac{3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{2ac^2} - \frac{(3i)\operatorname{Subst}\left(\int x\operatorname{PolyLog}\left(2,-ie^{ix}\right)\,dx,x,\arcsin(ax)\right)}{ac^2} + \frac{(3i)\operatorname{Subst}\left(\int x\operatorname{PolyLog}\left(2,ie^{ix}\right)\,dx,x,\arcsin(ax)\right)}{ac^2} - \frac{3\operatorname{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(ax)\right)}{ac^2} + \frac{3\operatorname{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(ax)\right)}{ac^2}$$

$$= -\frac{3\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)^3}{2c^2(1-a^2x^2)} - \frac{6i\arcsin(ax)\arctan\left(e^{i\arcsin(ax)}\right)}{ac^2} - \frac{i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{ac^2} + \frac{3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{2ac^2} - \frac{3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{2ac^2} - \frac{3\arcsin(ax)\operatorname{PolyLog}\left(3,-ie^{i\arcsin(ax)}\right)}{ac^2} + \frac{3\arcsin(ax)\operatorname{PolyLog}\left(3,ie^{i\arcsin(ax)}\right)}{ac^2} + \frac{(3i)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(ax)}\right)}{ac^2} - \frac{(3i)\operatorname{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(ax)}\right)}{ac^2} + \frac{3\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(3,-ie^{ix}\right)\,dx,x,\arcsin(ax)\right)}{ac^2} - \frac{3\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(3,ie^{ix}\right)\,dx,x,\arcsin(ax)\right)}{ac^2}$$

$$= -\frac{3\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)^3}{2c^2(1-a^2x^2)} - \frac{6i\arcsin(ax)\arctan\left(e^{i\arcsin(ax)}\right)}{ac^2} - \frac{i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{ac^2} + \frac{3i\,\text{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{ac^2} + \frac{3i\arcsin(ax)^2\,\text{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{2ac^2} - \frac{3i\,\text{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{ac^2} - \frac{3i\arcsin(ax)^2\,\text{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{2ac^2} - \frac{3\arcsin(ax)\,\text{PolyLog}\left(3,-ie^{i\arcsin(ax)}\right)}{ac^2} + \frac{3\arcsin(ax)\,\text{PolyLog}\left(3,ie^{i\arcsin(ax)}\right)}{ac^2} - \frac{(3i)\text{Subst}\left(\int\frac{\text{PolyLog}(3,-ix)}{x}dx,x,e^{i\arcsin(ax)}\right)}{ac^2} + \frac{(3i)\text{Subst}\left(\int\frac{\text{PolyLog}(3,ix)}{x}dx,x,e^{i\arcsin(ax)}\right)}{ac^2}$$

$$= -\frac{3\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)^3}{2c^2(1-a^2x^2)} - \frac{6i\arcsin(ax)\arctan\left(e^{i\arcsin(ax)}\right)}{ac^2} - \frac{i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{ac^2} + \frac{3i\,\text{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{ac^2} + \frac{3i\arcsin(ax)^2\,\text{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{2ac^2} - \frac{3i\,\text{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{ac^2} - \frac{3i\arcsin(ax)^2\,\text{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{2ac^2} - \frac{3\arcsin(ax)\,\text{PolyLog}\left(3,-ie^{i\arcsin(ax)}\right)}{ac^2} + \frac{3\arcsin(ax)\,\text{PolyLog}\left(3,ie^{i\arcsin(ax)}\right)}{ac^2} - \frac{3i\,\text{PolyLog}\left(4,-ie^{i\arcsin(ax)}\right)}{ac^2} + \frac{3i\,\text{PolyLog}\left(4,ie^{i\arcsin(ax)}\right)}{ac^2}$$

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 234, normalized size of antiderivative = 0.69

$$\int\frac{\arcsin(ax)^3}{(c-a^2cx^2)^2}\,dx = \frac{-\frac{3\arcsin(ax)^2}{\sqrt{1-a^2x^2}} + \frac{ax\arcsin(ax)^3}{1-a^2x^2} - 12i\arcsin(ax)\arctan\left(e^{i\arcsin(ax)}\right) - 2i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right) + 3i(2}{}$$

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^2,x]
```

```
[Out] ((-3*ArcSin[a*x]^2)/Sqrt[1 - a^2*x^2] + (a*x*ArcSin[a*x]^3)/(1 - a^2*x^2) -
 (12*I)*ArcSin[a*x]*ArcTan[E^(I*ArcSin[a*x])] - (2*I)*ArcSin[a*x]^3*ArcTan[
E^(I*ArcSin[a*x])] + (3*I)*(2 + ArcSin[a*x]^2)*PolyLog[2, (-I)*E^(I*ArcSin[
a*x])] - (3*I)*(2 + ArcSin[a*x]^2)*PolyLog[2, I*E^(I*ArcSin[a*x])] - 6*ArcS
```

in[a*x]*PolyLog[3, (-I)*E^(I*ArcSin[a*x])] + 6*ArcSin[a*x]*PolyLog[3, I*E^(I*ArcSin[a*x])] - (6*I)*PolyLog[4, (-I)*E^(I*ArcSin[a*x])] + (6*I)*PolyLog[4, I*E^(I*ArcSin[a*x])])/(2*a*c^2)

Maple [A] (verified)

Time = 0.23 (sec) , antiderivative size = 438, normalized size of antiderivative = 1.30

method	result
derivativedivides	$\frac{-\frac{\arcsin(ax)^2\left(ax\arcsin(ax)-3\sqrt{-a^2x^2+1}\right)}{2\left(a^2x^2-1\right)c^2}-\frac{\arcsin(ax)^3\ln\left(1+i\left(iax+\sqrt{-a^2x^2+1}\right)\right)}{2c^2}+\frac{3i\arcsin(ax)^2\operatorname{polylog}\left(2,-i\left(iax+\sqrt{-a^2x^2+1}\right)\right)}{2c^2}}{}$
default	$\frac{-\frac{\arcsin(ax)^2\left(ax\arcsin(ax)-3\sqrt{-a^2x^2+1}\right)}{2\left(a^2x^2-1\right)c^2}-\frac{\arcsin(ax)^3\ln\left(1+i\left(iax+\sqrt{-a^2x^2+1}\right)\right)}{2c^2}+\frac{3i\arcsin(ax)^2\operatorname{polylog}\left(2,-i\left(iax+\sqrt{-a^2x^2+1}\right)\right)}{2c^2}}{}$

[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^2,x,method=_RETURNVERBOSE)

[Out] 1/a*(-1/2/(a^2*x^2-1)*arcsin(a*x)^2*(a*x*arcsin(a*x)-3*(-a^2*x^2+1)^(1/2))/c^2-1/2/c^2*arcsin(a*x)^3*ln(1+I*(I*a*x+(-a^2*x^2+1)^(1/2)))+3/2*I/c^2*arcsin(a*x)^2*polylog(2,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))-3/c^2*arcsin(a*x)*polylog(3,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))-3*I/c^2*polylog(4,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))+1/2/c^2*arcsin(a*x)^3*ln(1-I*(I*a*x+(-a^2*x^2+1)^(1/2)))-3/2*I/c^2*arcsin(a*x)^2*polylog(2,I*(I*a*x+(-a^2*x^2+1)^(1/2)))+3/c^2*arcsin(a*x)*polylog(3,I*(I*a*x+(-a^2*x^2+1)^(1/2)))+3*I/c^2*polylog(4,I*(I*a*x+(-a^2*x^2+1)^(1/2)))-3/c^2*arcsin(a*x)*ln(1+I*(I*a*x+(-a^2*x^2+1)^(1/2)))+3/c^2*arcsin(a*x)*ln(1-I*(I*a*x+(-a^2*x^2+1)^(1/2)))+3*I/c^2*dilog(1+I*(I*a*x+(-a^2*x^2+1)^(1/2)))-3*I/c^2*dilog(1-I*(I*a*x+(-a^2*x^2+1)^(1/2))))

Fricas [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^2}\,dx = \int \frac{\arcsin{(ax)}^3}{(a^2cx^2-c)^2}\,dx$$

[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^2,x, algorithm="fricas")

[Out] integral(arcsin(a*x)^3/(a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2), x)

Sympy [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^2}\,dx = \frac{\int \frac{\operatorname{asin}^3(ax)}{a^4x^4-2a^2x^2+1}\,dx}{c^2}$$

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**2,x)
[Out] Integral(asin(a*x)**3/(a**4*x**4 - 2*a**2*x**2 + 1), x)/c**2
```

Maxima [A] (verification not implemented)

none

Time = 0.55 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.17

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^2}\,dx = -\frac{1}{4}\left(\frac{2\,x}{a^2c^2x^2-c^2} - \frac{\log(ax+1)}{ac^2} + \frac{\log(ax-1)}{ac^2}\right)\arcsin(ax)^3$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^2,x, algorithm="maxima")
[Out] -1/4*(2*x/(a^2*c^2*x^2 - c^2) - log(a*x + 1)/(a*c^2) + log(a*x - 1)/(a*c^2)
)*arcsin(a*x)^3
```

Giac [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^2}\,dx = \int \frac{\arcsin(ax)^3}{(a^2cx^2-c)^2}\,dx$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^2,x, algorithm="giac")
[Out] integrate(arcsin(a*x)^3/(a^2*c*x^2 - c)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^2}\,dx = \int \frac{\operatorname{asin}(a\,x)^3}{(c-a^2\,c\,x^2)^2}\,dx$$

```
[In] int(asin(a*x)^3/(c - a^2*c*x^2)^2,x)
[Out] int(asin(a*x)^3/(c - a^2*c*x^2)^2, x)
```

3.294 $\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^3}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 455

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^3}\,dx = -\frac{1}{4ac^3\sqrt{1-a^2x^2}}+\frac{x\arcsin(ax)}{4c^3(1-a^2x^2)}-\frac{\arcsin(ax)^2}{4ac^3(1-a^2x^2)^{3/2}}-\frac{9\arcsin(ax)^2}{8ac^3\sqrt{1-a^2x^2}}+\frac{x\arcsin(ax)^3}{4c^3(1-a^2x^2)^2}+\frac{3x\arcsin(ax)^3}{8c^3(1-a^2x^2)}-\frac{5i\arcsin(ax)\arctan\left(e^{i\arcsin(ax)}\right)}{ac^3}-\frac{3i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{4ac^3}+\frac{5i\operatorname{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{2ac^3}+\frac{9i\arcsin(ax)^2\operatorname{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{8ac^3}-\frac{5i\operatorname{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{2ac^3}-\frac{9i\arcsin(ax)^2\operatorname{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{8ac^3}-\frac{9\arcsin(ax)\operatorname{PolyLog}\left(3,-ie^{i\arcsin(ax)}\right)}{4ac^3}+\frac{9\arcsin(ax)\operatorname{PolyLog}\left(3,ie^{i\arcsin(ax)}\right)}{4ac^3}-\frac{9i\operatorname{PolyLog}\left(4,-ie^{i\arcsin(ax)}\right)}{4ac^3}+\frac{9i\operatorname{PolyLog}\left(4,ie^{i\arcsin(ax)}\right)}{4ac^3}$$

```
[Out] 1/4*x*arcsin(a*x)/c^3/(-a^2*x^2+1)-1/4*arcsin(a*x)^2/a/c^3/(-a^2*x^2+1)^(3/
2)+1/4*x*arcsin(a*x)^3/c^3/(-a^2*x^2+1)^2+3/8*x*arcsin(a*x)^3/c^3/(-a^2*x^2
+1)+9/4*I*polylog(4,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^3-9/4*I*polylog(4,-I*
(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^3+5/2*I*polylog(2,-I*(I*a*x+(-a^2*x^2+1)^(1
/2)))/a/c^3-9/8*I*arcsin(a*x)^2*polylog(2,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c
^3+9/8*I*arcsin(a*x)^2*polylog(2,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^3-5/2*I
```

```
*polylog(2,I*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^3-9/4*arcsin(a*x)*polylog(3,-I
*(I*a*x+(-a^2*x^2+1)^(1/2)))/a/c^3+9/4*arcsin(a*x)*polylog(3,I*(I*a*x+(-a^2
*x^2+1)^(1/2)))/a/c^3-5*I*arcsin(a*x)*arctan(I*a*x+(-a^2*x^2+1)^(1/2))/a/c^
3-3/4*I*arcsin(a*x)^3*arctan(I*a*x+(-a^2*x^2+1)^(1/2))/a/c^3-1/4/a/c^3/(-a^
2*x^2+1)^(1/2)-9/8*arcsin(a*x)^2/a/c^3/(-a^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.36 (sec) , antiderivative size = 455, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.550$, Rules used = {4747, 4749, 4266, 2611, 6744, 2320, 6724, 4767, 2317, 2438, 267}

$$\begin{aligned}\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^3}\,dx = {} & \frac{3x\arcsin(ax)^3}{8c^3(1-a^2x^2)} + \frac{x\arcsin(ax)^3}{4c^3(1-a^2x^2)^2} - \frac{9\arcsin(ax)^2}{8ac^3\sqrt{1-a^2x^2}} \\ & - \frac{\arcsin(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} + \frac{x\arcsin(ax)}{4c^3(1-a^2x^2)} - \frac{1}{4ac^3\sqrt{1-a^2x^2}} \\ & - \frac{3i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{4ac^3} - \frac{5i\arcsin(ax)\arctan\left(e^{i\arcsin(ax)}\right)}{ac^3} \\ & + \frac{9i\arcsin(ax)^2\operatorname{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{8ac^3} \\ & - \frac{9i\arcsin(ax)^2\operatorname{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{8ac^3} \\ & - \frac{9\arcsin(ax)\operatorname{PolyLog}\left(3,-ie^{i\arcsin(ax)}\right)}{4ac^3} \\ & + \frac{9\arcsin(ax)\operatorname{PolyLog}\left(3,ie^{i\arcsin(ax)}\right)}{4ac^3} \\ & + \frac{5i\operatorname{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{2ac^3} - \frac{5i\operatorname{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{2ac^3} \\ & - \frac{9i\operatorname{PolyLog}\left(4,-ie^{i\arcsin(ax)}\right)}{4ac^3} + \frac{9i\operatorname{PolyLog}\left(4,ie^{i\arcsin(ax)}\right)}{4ac^3}\end{aligned}$$

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^3,x]
```

```
[Out] -1/4*1/(a*c^3*Sqrt[1 - a^2*x^2]) + (x*ArcSin[a*x])/(4*c^3*(1 - a^2*x^2)) -
ArcSin[a*x]^2/(4*a*c^3*(1 - a^2*x^2)^(3/2)) - (9*ArcSin[a*x]^2)/(8*a*c^3*Sq
rt[1 - a^2*x^2]) + (x*ArcSin[a*x]^3)/(4*c^3*(1 - a^2*x^2)^2) + (3*x*ArcSin[
a*x]^3)/(8*c^3*(1 - a^2*x^2)) - ((5*I)*ArcSin[a*x]*ArcTan[E^(I*ArcSin[a*x])
])/(a*c^3) - (((3*I)/4)*ArcSin[a*x]^3*ArcTan[E^(I*ArcSin[a*x])])/(a*c^3) +
(((5*I)/2)*PolyLog[2, (-I)*E^(I*ArcSin[a*x])])/(a*c^3) + (((9*I)/8)*ArcSin[
a*x]^2*PolyLog[2, (-I)*E^(I*ArcSin[a*x])])/(a*c^3) - (((5*I)/2)*PolyLog[2,
I*E^(I*ArcSin[a*x])])/(a*c^3) - (((9*I)/8)*ArcSin[a*x]^2*PolyLog[2, I*E^(I*
ArcSin[a*x])])/(a*c^3) - (9*ArcSin[a*x]*PolyLog[3, (-I)*E^(I*ArcSin[a*x])])
/(4*a*c^3) + (9*ArcSin[a*x]*PolyLog[3, I*E^(I*ArcSin[a*x])])/(4*a*c^3) - ((
```

```
(9*I)/4)*PolyLog[4, (-I)*E^(I*ArcSin[a*x])])/(a*c^3) + (((9*I)/4)*PolyLog[4
, I*E^(I*ArcSin[a*x])])/(a*c^3)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
```

```
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x\arcsin(ax)^3}{4c^3(1-a^2x^2)^2} - \frac{(3a)\int \frac{x\arcsin(ax)^2}{(1-a^2x^2)^{5/2}}\,dx}{4c^3} + \frac{3\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^2}\,dx}{4c} \\
&= -\frac{\arcsin(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} + \frac{x\arcsin(ax)^3}{4c^3(1-a^2x^2)^2} + \frac{3x\arcsin(ax)^3}{8c^3(1-a^2x^2)} \\
&\quad + \frac{\int \frac{\arcsin(ax)}{(1-a^2x^2)^2}\,dx}{2c^3} - \frac{(9a)\int \frac{x\arcsin(ax)^2}{(1-a^2x^2)^{3/2}}\,dx}{8c^3} + \frac{3\int \frac{\arcsin(ax)^3}{c-a^2cx^2}\,dx}{8c^2}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{x\arcsin(ax)}{4c^3(1-a^2x^2)} - \frac{\arcsin(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} - \frac{9\arcsin(ax)^2}{8ac^3\sqrt{1-a^2x^2}} \\
&\quad + \frac{x\arcsin(ax)^3}{4c^3(1-a^2x^2)^2} + \frac{3x\arcsin(ax)^3}{8c^3(1-a^2x^2)} + \frac{\int \frac{\arcsin(ax)}{1-a^2x^2}\,dx}{4c^3} + \frac{9\int \frac{\arcsin(ax)}{1-a^2x^2}\,dx}{4c^3} \\
&\quad + \frac{3\text{Subst}\left(\int x^3\sec(x)\,dx, x, \arcsin(ax)\right)}{8ac^3} - \frac{a\int \frac{x}{(1-a^2x^2)^{3/2}}\,dx}{4c^3} \\
&= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)}{4c^3(1-a^2x^2)} - \frac{\arcsin(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} \\
&\quad - \frac{9\arcsin(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)^3}{4c^3(1-a^2x^2)^2} + \frac{3x\arcsin(ax)^3}{8c^3(1-a^2x^2)} \\
&\quad - \frac{3i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{4ac^3} + \frac{\text{Subst}\left(\int x\sec(x)\,dx, x, \arcsin(ax)\right)}{4ac^3} \\
&\quad - \frac{9\text{Subst}\left(\int x^2\log\left(1-ie^{ix}\right)\,dx, x, \arcsin(ax)\right)}{8ac^3} \\
&\quad + \frac{9\text{Subst}\left(\int x^2\log\left(1+ie^{ix}\right)\,dx, x, \arcsin(ax)\right)}{8ac^3} \\
&\quad + \frac{9\text{Subst}\left(\int x\sec(x)\,dx, x, \arcsin(ax)\right)}{4ac^3} \\
&= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)}{4c^3(1-a^2x^2)} - \frac{\arcsin(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} - \frac{9\arcsin(ax)^2}{8ac^3\sqrt{1-a^2x^2}} \\
&\quad + \frac{x\arcsin(ax)^3}{4c^3(1-a^2x^2)^2} + \frac{3x\arcsin(ax)^3}{8c^3(1-a^2x^2)} - \frac{5i\arcsin(ax)\arctan\left(e^{i\arcsin(ax)}\right)}{ac^3} \\
&\quad - \frac{3i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{4ac^3} + \frac{9i\arcsin(ax)^2\,\text{PolyLog}\left(2, -ie^{i\arcsin(ax)}\right)}{8ac^3} \\
&\quad - \frac{9i\arcsin(ax)^2\,\text{PolyLog}\left(2, ie^{i\arcsin(ax)}\right)}{8ac^3} \\
&\quad - \frac{(9i)\text{Subst}\left(\int x\,\text{PolyLog}\left(2, -ie^{ix}\right)\,dx, x, \arcsin(ax)\right)}{4ac^3} \\
&\quad + \frac{(9i)\text{Subst}\left(\int x\,\text{PolyLog}\left(2, ie^{ix}\right)\,dx, x, \arcsin(ax)\right)}{4ac^3} \\
&\quad - \frac{\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(ax)\right)}{4ac^3} \\
&\quad + \frac{\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(ax)\right)}{4ac^3} \\
&\quad - \frac{9\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(ax)\right)}{4ac^3} \\
&\quad + \frac{9\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(ax)\right)}{4ac^3}
\end{aligned}
$$

$$= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)}{4c^3(1-a^2x^2)} - \frac{\arcsin(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} - \frac{9\arcsin(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)^3}{4c^3(1-a^2x^2)^2} + \frac{3x\arcsin(ax)^3}{8c^3(1-a^2x^2)} - \frac{5i\arcsin(ax)\arctan\left(e^{i\arcsin(ax)}\right)}{ac^3} - \frac{3i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{4ac^3} + \frac{9i\arcsin(ax)^2\operatorname{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{8ac^3} - \frac{9i\arcsin(ax)^2\operatorname{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{8ac^3} - \frac{9\arcsin(ax)\operatorname{PolyLog}\left(3,-ie^{i\arcsin(ax)}\right)}{4ac^3} + \frac{9\arcsin(ax)\operatorname{PolyLog}\left(3,ie^{i\arcsin(ax)}\right)}{4ac^3} + \frac{i\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(ax)}\right)}{4ac^3} - \frac{i\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(ax)}\right)}{4ac^3} + \frac{(9i)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(ax)}\right)}{4ac^3} - \frac{(9i)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(ax)}\right)}{4ac^3} + \frac{9\text{Subst}\left(\int\operatorname{PolyLog}\left(3,-ie^{ix}\right)\,dx,x,\arcsin(ax)\right)}{4ac^3} - \frac{9\text{Subst}\left(\int\operatorname{PolyLog}\left(3,ie^{ix}\right)\,dx,x,\arcsin(ax)\right)}{4ac^3}$$

$$= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)}{4c^3(1-a^2x^2)} - \frac{\arcsin(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} - \frac{9\arcsin(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)^3}{4c^3(1-a^2x^2)^2} + \frac{3x\arcsin(ax)^3}{8c^3(1-a^2x^2)} - \frac{5i\arcsin(ax)\arctan\left(e^{i\arcsin(ax)}\right)}{ac^3} - \frac{3i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{4ac^3} + \frac{5i\operatorname{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{2ac^3} + \frac{9i\arcsin(ax)^2\operatorname{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{8ac^3} - \frac{5i\operatorname{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{2ac^3} - \frac{9i\arcsin(ax)^2\operatorname{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{8ac^3} - \frac{9\arcsin(ax)\operatorname{PolyLog}\left(3,-ie^{i\arcsin(ax)}\right)}{4ac^3} + \frac{9\arcsin(ax)\operatorname{PolyLog}\left(3,ie^{i\arcsin(ax)}\right)}{4ac^3} - \frac{(9i)\text{Subst}\left(\int\frac{\operatorname{PolyLog}(3,-ix)}{x}\,dx,x,e^{i\arcsin(ax)}\right)}{4ac^3} + \frac{(9i)\text{Subst}\left(\int\frac{\operatorname{PolyLog}(3,ix)}{x}\,dx,x,e^{i\arcsin(ax)}\right)}{4ac^3}$$

$$= -\frac{1}{4ac^3\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)}{4c^3(1-a^2x^2)} - \frac{\arcsin(ax)^2}{4ac^3(1-a^2x^2)^{3/2}} - \frac{9\arcsin(ax)^2}{8ac^3\sqrt{1-a^2x^2}} + \frac{x\arcsin(ax)^3}{4c^3(1-a^2x^2)^2} + \frac{3x\arcsin(ax)^3}{8c^3(1-a^2x^2)} - \frac{5i\arcsin(ax)\arctan\left(e^{i\arcsin(ax)}\right)}{ac^3} - \frac{3i\arcsin(ax)^3\arctan\left(e^{i\arcsin(ax)}\right)}{4ac^3} + \frac{5i\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{2ac^3} + \frac{9i\arcsin(ax)^2\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(ax)}\right)}{8ac^3} - \frac{5i\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{2ac^3} - \frac{9i\arcsin(ax)^2\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(ax)}\right)}{8ac^3} - \frac{9\arcsin(ax)\,\mathrm{PolyLog}\left(3,-ie^{i\arcsin(ax)}\right)}{4ac^3} + \frac{9\arcsin(ax)\,\mathrm{PolyLog}\left(3,ie^{i\arcsin(ax)}\right)}{4ac^3} - \frac{9i\,\mathrm{PolyLog}\left(4,-ie^{i\arcsin(ax)}\right)}{4ac^3} + \frac{9i\,\mathrm{PolyLog}\left(4,ie^{i\arcsin(ax)}\right)}{4ac^3}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1544 vs. $2(455) = 910$.

Time = 12.76 (sec) , antiderivative size = 1544, normalized size of antiderivative = 3.39

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^3}\,dx = -\frac{\frac{1}{4}(1+5\arcsin(ax)^2) - \frac{5}{2}\left(\arcsin(ax)\left(\log\left(1-ie^{i\arcsin(ax)}\right) - \log\left(1+ie^{i\arcsin(ax)}\right)\right) + i\left(\mathrm{PolyLog}\left(2,-ie^{i\right.\right.\right.}}{}$$

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^3,x]
```

```
[Out] -(((1 + 5*ArcSin[a*x]^2)/4 - (5*(ArcSin[a*x]*(Log[1 - I*E^(I*ArcSin[a*x])]
- Log[1 + I*E^(I*ArcSin[a*x])]) + I*(PolyLog[2, (-I)*E^(I*ArcSin[a*x])] - P
olyLog[2, I*E^(I*ArcSin[a*x])])))/2 - (3*((Pi^3*Log[Cot[(Pi/2 - ArcSin[a*x]
)/2]])/8 + (3*Pi^2*((Pi/2 - ArcSin[a*x])*(Log[1 - E^(I*(Pi/2 - ArcSin[a*x])
)] - Log[1 + E^(I*(Pi/2 - ArcSin[a*x]))]) + I*(PolyLog[2, -E^(I*(Pi/2 - Arc
Sin[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcSin[a*x]))])))/4 - (3*Pi*((Pi/2 -
ArcSin[a*x])^2*(Log[1 - E^(I*(Pi/2 - ArcSin[a*x]))] - Log[1 + E^(I*(Pi/2 -
ArcSin[a*x]))]) + (2*I)*(Pi/2 - ArcSin[a*x])*(PolyLog[2, -E^(I*(Pi/2 - ArcS
in[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcSin[a*x]))]) + 2*(-PolyLog[3, -E^(I
*(Pi/2 - ArcSin[a*x]))] + PolyLog[3, E^(I*(Pi/2 - ArcSin[a*x]))])))/2 + 8*(
(I/64)*(Pi/2 - ArcSin[a*x])^4 + (I/4)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2)^4
- ((Pi/2 - ArcSin[a*x])^3*Log[1 + E^(I*(Pi/2 - ArcSin[a*x]))])/8 - (Pi^3*(I
*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2) - Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + A
rcSin[a*x])/2))]))/8 - (Pi/2 + (-1/2*Pi + ArcSin[a*x])/2)^3*Log[1 + E^((2*I
)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2))] + ((3*I)/8)*(Pi/2 - ArcSin[a*x])^2*P
```

```
olyLog[2, -E^(I*(Pi/2 - ArcSin[a*x]))] + (3*Pi^2*((I/2)*(Pi/2 + (-1/2*Pi +
ArcSin[a*x])/2)^2 - (Pi/2 + (-1/2*Pi + ArcSin[a*x])/2)*Log[1 + E^((2*I)*(Pi
/2 + (-1/2*Pi + ArcSin[a*x])/2))] + (I/2)*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/
2*Pi + ArcSin[a*x])/2))]))/4 + ((3*I)/2)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2)
^2*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2))] - (3*(Pi/2 - A
rcSin[a*x])*PolyLog[3, -E^(I*(Pi/2 - ArcSin[a*x]))])/4 - (3*Pi*((I/3)*(Pi/2
 + (-1/2*Pi + ArcSin[a*x])/2)^3 - (Pi/2 + (-1/2*Pi + ArcSin[a*x])/2)^2*Log[
1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2))] + I*(Pi/2 + (-1/2*Pi + Ar
cSin[a*x])/2)*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2))] - P
olyLog[3, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2))]/2))/2 - (3*(Pi/2 +
 (-1/2*Pi + ArcSin[a*x])/2)*PolyLog[3, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcSin[
a*x])/2))])/2 - ((3*I)/4)*PolyLog[4, -E^(I*(Pi/2 - ArcSin[a*x]))] - ((3*I)/
4)*PolyLog[4, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcSin[a*x])/2))])))/8 - ArcSin[
a*x]^3/(16*(Cos[ArcSin[a*x]/2] - Sin[ArcSin[a*x]/2])^4) - (2*ArcSin[a*x] -
ArcSin[a*x]^2 + 3*ArcSin[a*x]^3)/(16*(Cos[ArcSin[a*x]/2] - Sin[ArcSin[a*x]/
2])^2) + (ArcSin[a*x]^2*Sin[ArcSin[a*x]/2])/(8*(Cos[ArcSin[a*x]/2] - Sin[Ar
cSin[a*x]/2])^3) + ArcSin[a*x]^3/(16*(Cos[ArcSin[a*x]/2] + Sin[ArcSin[a*x]/
2])^4) - (ArcSin[a*x]^2*Sin[ArcSin[a*x]/2])/(8*(Cos[ArcSin[a*x]/2] + Sin[Ar
cSin[a*x]/2])^3) - (-2*ArcSin[a*x] - ArcSin[a*x]^2 - 3*ArcSin[a*x]^3)/(16*(
Cos[ArcSin[a*x]/2] + Sin[ArcSin[a*x]/2])^2) - (-Sin[ArcSin[a*x]/2] - 5*ArcS
in[a*x]^2*Sin[ArcSin[a*x]/2])/(4*(Cos[ArcSin[a*x]/2] - Sin[ArcSin[a*x]/2]))
 - (Sin[ArcSin[a*x]/2] + 5*ArcSin[a*x]^2*Sin[ArcSin[a*x]/2])/(4*(Cos[ArcSin
[a*x]/2] + Sin[ArcSin[a*x]/2])))/(a*c^3))
```

Maple [A] (verified)

Time = 0.25 (sec) , antiderivative size = 543, normalized size of antiderivative = 1.19

method	result
derivativedivides	$\frac{-\frac{3a^3x^3\arcsin(ax)^3-9\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^2x^2-5ax\arcsin(ax)^3+2a^3x^3\arcsin(ax)+11\arcsin(ax)^2\sqrt{-a^2x^2+1}-2a^2x^2\sqrt{-a^2x^2}}{8\left(a^4x^4-2a^2x^2+1\right)c^3}}{}$
default	$-\frac{3a^3x^3\arcsin(ax)^3-9\arcsin(ax)^2\sqrt{-a^2x^2+1}\,a^2x^2-5ax\arcsin(ax)^3+2a^3x^3\arcsin(ax)+11\arcsin(ax)^2\sqrt{-a^2x^2+1}-2a^2x^2\sqrt{-a^2x^2}}{8\left(a^4x^4-2a^2x^2+1\right)c^3}$

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^3,x,method=_RETURNVERBOSE)

[Out] 1/a*(-1/8*(3*a^3*x^3*arcsin(a*x)^3-9*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^2*x
^2-5*a*x*arcsin(a*x)^3+2*a^3*x^3*arcsin(a*x)+11*arcsin(a*x)^2*(-a^2*x^2+1)^
(1/2)-2*a^2*x^2*(-a^2*x^2+1)^(1/2)-2*a*x*arcsin(a*x)+2*(-a^2*x^2+1)^(1/2))/
(a^4*x^4-2*a^2*x^2+1)/c^3-3/8/c^3*arcsin(a*x)^3*ln(1+I*(I*a*x+(-a^2*x^2+1)^
(1/2)))+9/8*I/c^3*arcsin(a*x)^2*polylog(2,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))-9/
4/c^3*arcsin(a*x)*polylog(3,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))-9/4*I/c^3*polylo
g(4,-I*(I*a*x+(-a^2*x^2+1)^(1/2)))+3/8/c^3*arcsin(a*x)^3*ln(1-I*(I*a*x+(-a^
2*x^2+1)^(1/2)))-9/8*I/c^3*arcsin(a*x)^2*polylog(2,I*(I*a*x+(-a^2*x^2+1)^(1
```

```
/2)))+9/4/c^3*arcsin(a*x)*polylog(3,I*(I*a*x+(-a^2*x^2+1)^(1/2)))+9/4*I/c^3
*polylog(4,I*(I*a*x+(-a^2*x^2+1)^(1/2)))-5/2/c^3*arcsin(a*x)*ln(1+I*(I*a*x+
(-a^2*x^2+1)^(1/2)))+5/2/c^3*arcsin(a*x)*ln(1-I*(I*a*x+(-a^2*x^2+1)^(1/2)))
+5/2*I/c^3*dilog(1+I*(I*a*x+(-a^2*x^2+1)^(1/2)))-5/2*I/c^3*dilog(1-I*(I*a*x
+(-a^2*x^2+1)^(1/2))))
```

Fricas [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^3}\,dx = \int -\frac{\arcsin{(ax)}^3}{(a^2cx^2-c)^3}\,dx$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^3,x, algorithm="fricas")
[Out] integral(-arcsin(a*x)^3/(a^6*c^3*x^6 - 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 - c^3)
, x)
```

Sympy [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^3}\,dx = -\frac{\int \frac{\operatorname{asin}^3{(ax)}}{a^6x^6-3a^4x^4+3a^2x^2-1}\,dx}{c^3}$$

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**3,x)
[Out] -Integral(asin(a*x)**3/(a**6*x**6 - 3*a**4*x**4 + 3*a**2*x**2 - 1), x)/c**3
```

Maxima [A] (verification not implemented)

none

Time = 0.66 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.17

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^3}\,dx = -\frac{1}{16}\left(\frac{2\,(3\,a^2x^3-5\,x)}{a^4c^3x^4-2\,a^2c^3x^2+c^3}-\frac{3\,\log{(ax+1)}}{ac^3}+\frac{3\,\log{(ax-1)}}{ac^3}\right)\arcsin{(ax)}^3$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^3,x, algorithm="maxima")
[Out] -1/16*(2*(3*a^2*x^3 - 5*x)/(a^4*c^3*x^4 - 2*a^2*c^3*x^2 + c^3) - 3*log(a*x
+ 1)/(a*c^3) + 3*log(a*x - 1)/(a*c^3))*arcsin(a*x)^3
```

Giac [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^3}\,dx=\int -\frac{\arcsin(ax)^3}{(a^2cx^2-c)^3}\,dx$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^3,x, algorithm="giac")
[Out] integrate(-arcsin(a*x)^3/(a^2*c*x^2 - c)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^3}\,dx=\int \frac{\mathrm{asin}(a\,x)^3}{(c-a^2\,c\,x^2)^3}\,dx$$

```
[In] int(asin(a*x)^3/(c - a^2*c*x^2)^3,x)
[Out] int(asin(a*x)^3/(c - a^2*c*x^2)^3, x)
```

3.295 $\int (c - a^2cx^2)^{5/2} \arcsin(ax)^3 \, dx$

Optimal result

Integrand size = 22, antiderivative size = 533

$$\int (c-a^2cx^2)^{5/2}\arcsin(ax)^3\,dx = \frac{865ac^2x^2\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}} - \frac{65a^3c^2x^4\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}}$$
$$- \frac{c^2(1-a^2x^2)^{5/2}\sqrt{c-a^2cx^2}}{216a} - \frac{245}{384}c^2x\sqrt{c-a^2cx^2}\arcsin(ax)$$
$$- \frac{65}{576}c^2x(1-a^2x^2)\sqrt{c-a^2cx^2}\arcsin(ax) - \frac{1}{36}c^2x(1-a^2x^2)^2\sqrt{c-a^2cx^2}\arcsin(ax)$$
$$+ \frac{115c^2\sqrt{c-a^2cx^2}\arcsin(ax)^2}{768a\sqrt{1-a^2x^2}} - \frac{15ac^2x^2\sqrt{c-a^2cx^2}\arcsin(ax)^2}{32\sqrt{1-a^2x^2}}$$
$$+ \frac{5c^2(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{32a} + \frac{c^2(1-a^2x^2)^{5/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{12a}$$
$$+ \frac{5}{16}c^2x\sqrt{c-a^2cx^2}\arcsin(ax)^3 + \frac{5}{24}cx(c-a^2cx^2)^{3/2}\arcsin(ax)^3 + \frac{1}{6}x(c-a^2cx^2)^{5/2}\arcsin(ax)^3 + \frac{5c^2\sqrt{c-a^2c}}{64a\sqrt{1}}$$

```
[Out] 5/24*c*x*(-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3+1/6*x*(-a^2*c*x^2+c)^(5/2)*arcs
in(a*x)^3-1/216*c^2*(-a^2*x^2+1)^(5/2)*(-a^2*c*x^2+c)^(1/2)/a-245/384*c^2*x
*arcsin(a*x)*(-a^2*c*x^2+c)^(1/2)-65/576*c^2*x*(-a^2*x^2+1)*arcsin(a*x)*(-a
^2*c*x^2+c)^(1/2)-1/36*c^2*x*(-a^2*x^2+1)^2*arcsin(a*x)*(-a^2*c*x^2+c)^(1/2
)+5/32*c^2*(-a^2*x^2+1)^(3/2)*arcsin(a*x)^2*(-a^2*c*x^2+c)^(1/2)/a+1/12*c^2
*(-a^2*x^2+1)^(5/2)*arcsin(a*x)^2*(-a^2*c*x^2+c)^(1/2)/a+5/16*c^2*x*arcsin(
a*x)^3*(-a^2*c*x^2+c)^(1/2)+865/2304*a*c^2*x^2*(-a^2*c*x^2+c)^(1/2)/(-a^2*x
^2+1)^(1/2)-65/2304*a^3*c^2*x^4*(-a^2*c*x^2+c)^(1/2)/(-a^2*x^2+1)^(1/2)+115
/768*c^2*arcsin(a*x)^2*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-15/32*a*c^
2*x^2*arcsin(a*x)^2*(-a^2*c*x^2+c)^(1/2)/(-a^2*x^2+1)^(1/2)+5/64*c^2*arcsin
(a*x)^4*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 533, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.409, Rules used = {4743, 4741, 4737, 4723, 4795, 30, 4767, 14, 267}

$$\int \left(c-a^2cx^2\right)^{5/2}\arcsin(ax)^3\,dx = -\frac{15ac^2x^2\arcsin(ax)^2\sqrt{c-a^2cx^2}}{32\sqrt{1-a^2x^2}} + \frac{5}{16}c^2x\arcsin(ax)^3\sqrt{c-a^2cx^2} - \frac{245}{384}c^2x\arcsin(ax)\sqrt{c-a^2cx^2} - \frac{1}{36}c^2x\left(1-a^2x^2\right)^2\arcsin(ax)\sqrt{c-a^2cx^2} - \frac{65}{576}c^2x\left(1-a^2x^2\right)\arcsin(ax)\sqrt{c-a^2cx^2} + \frac{5c^2\arcsin(ax)^4\sqrt{c-a^2cx^2}}{64a\sqrt{1-a^2x^2}} + \frac{c^2(1-a^2x^2)^{5/2}\arcsin(ax)^2\sqrt{c-a^2cx^2}}{12a} + \frac{5c^2(1-a^2x^2)^{3/2}\arcsin(ax)^2\sqrt{c-a^2cx^2}}{32a} + \frac{115c^2\arcsin(ax)^2\sqrt{c-a^2cx^2}}{768a\sqrt{1-a^2x^2}} + \frac{1}{6}x\arcsin(ax)^3\left(c-a^2cx^2\right)^{5/2} + \frac{5}{24}cx\arcsin(ax)^3\left(c-a^2cx^2\right)^{3/2} + \frac{865ac^2x^2\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}} - \frac{c^2(1-a^2x^2)^{5/2}\sqrt{c}}{216a}$$

```
[In] Int[(c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^3,x]
```

```
[Out] (865*a*c^2*x^2*Sqrt[c - a^2*c*x^2])/(2304*Sqrt[1 - a^2*x^2]) - (65*a^3*c^2*
x^4*Sqrt[c - a^2*c*x^2])/(2304*Sqrt[1 - a^2*x^2]) - (c^2*(1 - a^2*x^2)^(5/2
)*Sqrt[c - a^2*c*x^2])/(216*a) - (245*c^2*x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]
)/384 - (65*c^2*x*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x])/576 - (c^2
*x*(1 - a^2*x^2)^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x])/36 + (115*c^2*Sqrt[c -
a^2*c*x^2]*ArcSin[a*x]^2)/(768*a*Sqrt[1 - a^2*x^2]) - (15*a*c^2*x^2*Sqrt[c
- a^2*c*x^2]*ArcSin[a*x]^2)/(32*Sqrt[1 - a^2*x^2]) + (5*c^2*(1 - a^2*x^2)^(
3/2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(32*a) + (c^2*(1 - a^2*x^2)^(5/2)*S
qrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(12*a) + (5*c^2*x*Sqrt[c - a^2*c*x^2]*Arc
Sin[a*x]^3)/16 + (5*c*x*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^3)/24 + (x*(c - a
^2*c*x^2)^(5/2)*ArcSin[a*x]^3)/6 + (5*c^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^4
)/(64*a*Sqrt[1 - a^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{6}x\left(c-a^2cx^2\right)^{5/2}\arcsin(ax)^3 + \frac{1}{6}(5c)\int\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^3\,dx - \frac{\left(ac^2\sqrt{c-a^2cx^2}\right)\int x\left(1-a^2x^2\right)^2\arcsin(ax)^2\,dx}{2\sqrt{1-a^2x^2}}$$

$$= \frac{c^2\left(1-a^2x^2\right)^{5/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{12a} + \frac{5}{24}cx\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^3 + \frac{1}{6}x\left(c-a^2cx^2\right)^{5/2}\arcsin(ax)^3 + \frac{1}{8}\left(5c^2\right)\int\sqrt{c-a^2cx^2}\arcsin(ax)^3\,dx - \frac{\left(c^2\sqrt{c-a^2cx^2}\right)\int\left(1-a^2\right.}{6\sqrt{1-a^2}}$$

$$= -\frac{1}{36}c^2x\left(1-a^2x^2\right)^2\sqrt{c-a^2cx^2}\arcsin(ax) + \frac{5c^2\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{32a} + \frac{c^2\left(1-a^2x^2\right)^{5/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{12a} + \frac{5}{16}c^2x\sqrt{c-a^2cx^2}\arcsin(ax)^3 + \frac{5}{24}cx\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^3 + \frac{1}{6}x\left(c-a^2cx^2\right)^{5/2}\arcsin(ax)^3 - \frac{\left(5c^2\sqrt{c-a^2cx^2}\right)\int\left(1-a^2x^2\right)^{3/}}{36\sqrt{1-a^2x^2}}$$

$$= -\frac{c^2\left(1-a^2x^2\right)^{5/2}\sqrt{c-a^2cx^2}}{216a} - \frac{65}{576}c^2x\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\arcsin(ax) - \frac{1}{36}c^2x\left(1-a^2x^2\right)^2\sqrt{c-a^2cx^2}\arcsin(ax) - \frac{15ac^2x^2\sqrt{c-a^2cx^2}\arcsin(ax)^2}{32\sqrt{1-a^2x^2}} + \frac{5c^2\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{32a} + \frac{c^2\left(1-a^2x^2\right)^{5/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{12a}$$

$$+ \frac{5}{16}c^2x\sqrt{c-a^2cx^2}\arcsin(ax)^3 + \frac{5}{24}cx\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^3 + \frac{1}{6}x\left(c-a^2cx^2\right)^{5/2}\arcsin(ax)^3 +$$

$$= -\frac{c^2(1-a^2x^2)^{5/2}\sqrt{c-a^2cx^2}}{216a} - \frac{245}{384}c^2x\sqrt{c-a^2cx^2}\arcsin(ax) - \frac{65}{576}c^2x(1-a^2x^2)\sqrt{c-a^2cx^2}\arcsin(ax) - \frac{1}{36}c^2x(1-a^2x^2)^2\sqrt{c-a^2cx^2}\arcsin(ax) - \frac{15ac^2x^2\sqrt{c-a^2cx^2}\arcsin(ax)^2}{32\sqrt{1-a^2x^2}} + \frac{5c^2(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{32a} + \frac{c^2(1-a^2x^2)^{5/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{12a} + \frac{5}{16}c^2x\sqrt{c-a^2cx^2}\arcsin(ax)^3 + \frac{5}{24}cx(c-a^2cx^2)^{3/2}\arcsin(ax)^3 + \frac{1}{6}x(c-a^2cx^2)^{5/2}\arcsin(ax)^3 + \frac{5}{}$$

$$= \frac{865ac^2x^2\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}} - \frac{65a^3c^2x^4\sqrt{c-a^2cx^2}}{2304\sqrt{1-a^2x^2}} - \frac{c^2(1-a^2x^2)^{5/2}\sqrt{c-a^2cx^2}}{216a} - \frac{245}{384}c^2x\sqrt{c-a^2cx^2}\arcsin(ax) - \frac{65}{576}c^2x(1-a^2x^2)\sqrt{c-a^2cx^2}\arcsin(ax) - \frac{1}{36}c^2x(1-a^2x^2)^2\sqrt{c-a^2cx^2}\arcsin(ax) + \frac{115c^2\sqrt{c-a^2cx^2}\arcsin(ax)^2}{768a\sqrt{1-a^2x^2}} - \frac{15ac^2x^2\sqrt{c-a^2cx^2}\arcsin(ax)^2}{32\sqrt{1-a^2x^2}} + \frac{5c^2(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{32a} + \frac{c^2(1-a^2x^2)^{5/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{12a} + \frac{5}{16}c^2x\sqrt{c-a^2cx^2}\arcsin(ax)^3 + \frac{5}{24}cx(c-a^2cx^2)^{3/2}\arcsin(ax)^3 + \frac{1}{6}x(c-a^2cx^2)^{5/2}\arcsin(ax)^3 + \frac{5}{}$$

Mathematica [A] (verified)

Time = 0.69 (sec) , antiderivative size = 179, normalized size of antiderivative = 0.34

$$\int (c-a^2cx^2)^{5/2}\arcsin(ax)^3\,dx = \frac{c^2\sqrt{c-a^2cx^2}(4320\arcsin(ax)^4 - 9720\cos(2\arcsin(ax)) - 243\cos(4\arcsin(ax))}{}$$

```
[In] Integrate[(c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^3,x]
[Out] (c^2*Sqrt[c - a^2*c*x^2]*(4320*ArcSin[a*x]^4 - 9720*Cos[2*ArcSin[a*x]] - 24
3*Cos[4*ArcSin[a*x]] - 8*Cos[6*ArcSin[a*x]] + 72*ArcSin[a*x]^2*(270*Cos[2*A
rcSin[a*x]] + 27*Cos[4*ArcSin[a*x]] + 2*Cos[6*ArcSin[a*x]]) + 288*ArcSin[a*
x]^3*(45*Sin[2*ArcSin[a*x]] + 9*Sin[4*ArcSin[a*x]] + Sin[6*ArcSin[a*x]]) -
12*ArcSin[a*x]*(1620*Sin[2*ArcSin[a*x]] + 81*Sin[4*ArcSin[a*x]] + 4*Sin[6*A
rcSin[a*x]])))/(55296*a*Sqrt[1 - a^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.21 (sec) , antiderivative size = 699, normalized size of antiderivative = 1.31

method	result
default	$-\frac{5\sqrt{-c(a^2x^2-1)}\,\sqrt{-a^2x^2+1}\,\arcsin(ax)^4c^2}{64a(a^2x^2-1)}+\frac{\sqrt{-c(a^2x^2-1)}\,\left(-32i\sqrt{-a^2x^2+1}\,a^6x^6+32a^7x^7+48i\sqrt{-a^2x^2+1}\,a^4x^4-64a^5x^5-1\right.}{}$

```
[In] int((-a^2*c*x^2+c)^(5/2)*arcsin(a*x)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -5/64*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/(a^2*x^2-1)*arcsin(a*x)^4
*c^2+1/13824*(-c*(a^2*x^2-1))^(1/2)*(-32*I*(-a^2*x^2+1)^(1/2)*a^6*x^6+32*a^
7*x^7+48*I*(-a^2*x^2+1)^(1/2)*a^4*x^4-64*a^5*x^5-18*I*(-a^2*x^2+1)^(1/2)*a^
2*x^2+38*a^3*x^3+I*(-a^2*x^2+1)^(1/2)-6*a*x)*(18*I*arcsin(a*x)^2+36*arcsin(
a*x)^3-I-6*arcsin(a*x))*c^2/a/(a^2*x^2-1)+15/512*(-c*(a^2*x^2-1))^(1/2)*(2*
I*(-a^2*x^2+1)^(1/2)*a^2*x^2+2*a^3*x^3-I*(-a^2*x^2+1)^(1/2)-2*a*x)*(-6*I*ar
csin(a*x)^2+4*arcsin(a*x)^3+3*I-6*arcsin(a*x))*c^2/a/(a^2*x^2-1)-1/110592*(
-c*(a^2*x^2-1))^(1/2)*(I*a^2*x^2-a*x*(-a^2*x^2+1)^(1/2)-I)*(2088*I*arcsin(a
*x)^2+2304*arcsin(a*x)^3-251*I-924*arcsin(a*x))*cos(5*arcsin(a*x))*c^2/a/(a
^2*x^2-1)+5/110592*(-c*(a^2*x^2-1))^(1/2)*(I*(-a^2*x^2+1)^(1/2)*a*x+a^2*x^2
-1)*(360*I*arcsin(a*x)^2+576*arcsin(a*x)^3-47*I-204*arcsin(a*x))*sin(5*arcs
in(a*x))*c^2/a/(a^2*x^2-1)-3/4096*(-c*(a^2*x^2-1))^(1/2)*(I*a^2*x^2-a*x*(-a
^2*x^2+1)^(1/2)-I)*(264*I*arcsin(a*x)^2+128*arcsin(a*x)^3-123*I-228*arcsin(
a*x))*cos(3*arcsin(a*x))*c^2/a/(a^2*x^2-1)+9/4096*(-c*(a^2*x^2-1))^(1/2)*(I
*(-a^2*x^2+1)^(1/2)*a*x+a^2*x^2-1)*(72*I*arcsin(a*x)^2+64*arcsin(a*x)^3-39*
I-84*arcsin(a*x))*sin(3*arcsin(a*x))*c^2/a/(a^2*x^2-1)
```

Fricas [F]

$$\int \left(c-a^2cx^2\right)^{5/2}\arcsin(ax)^3\,dx=\int \left(-a^2cx^2+c\right)^{\frac{5}{2}}\arcsin\left(ax\right)^3\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^(5/2)*arcsin(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)*sqrt(-a^2*c*x^2 + c)*arcsin(a*
x)^3, x)
```

Sympy [F]

$$\int \left(c-a^2cx^2\right)^{5/2}\arcsin(ax)^3\,dx=\int \left(-c(ax-1)\,(ax+1)\right)^{\frac{5}{2}}\operatorname{asin}^3\left(ax\right)dx$$

```
[In] integrate((-a**2*c*x**2+c)**(5/2)*asin(a*x)**3,x)
[Out] Integral((-c*(a*x - 1)*(a*x + 1))**(5/2)*asin(a*x)**3, x)
```

Maxima [F]

$$\int \left(c-a^2cx^2\right)^{5/2}\arcsin(ax)^3\,dx=\int \left(-a^2cx^2+c\right)^{\frac{5}{2}}\arcsin\left(ax\right)^3\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^(5/2)*arcsin(a*x)^3,x, algorithm="maxima")
[Out] integrate((-a^2*c*x^2 + c)^(5/2)*arcsin(a*x)^3, x)
```

Giac [F(-2)]

Exception generated.

$$\int \left(c-a^2cx^2\right)^{5/2}\arcsin(ax)^3\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(5/2)*arcsin(a*x)^3,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \left(c-a^2cx^2\right)^{5/2}\arcsin(ax)^3\,dx=\int \operatorname{asin}(a\,x)^3\,\left(c-a^2\,c\,x^2\right)^{5/2}\,dx$$

```
[In] int(asin(a*x)^3*(c - a^2*c*x^2)^(5/2),x)
[Out] int(asin(a*x)^3*(c - a^2*c*x^2)^(5/2), x)
```

3.296 $\int (c-a^2cx^2)^{3/2}\arcsin(ax)^3\,dx$

Optimal result

Integrand size = 22, antiderivative size = 365

$$\begin{aligned}\int (c-a^2cx^2)^{3/2}\arcsin(ax)^3\,dx &= \frac{51acx^2\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}-\frac{3a^3cx^4\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}\\&-\frac{45}{64}cx\sqrt{c-a^2cx^2}\arcsin(ax)-\frac{3}{32}cx(1-a^2x^2)\sqrt{c-a^2cx^2}\arcsin(ax)\\&+\frac{27c\sqrt{c-a^2cx^2}\arcsin(ax)^2}{128a\sqrt{1-a^2x^2}}-\frac{9acx^2\sqrt{c-a^2cx^2}\arcsin(ax)^2}{16\sqrt{1-a^2x^2}}\\&+\frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{16a}+\frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^3\\&+\frac{1}{4}x(c-a^2cx^2)^{3/2}\arcsin(ax)^3+\frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^4}{32a\sqrt{1-a^2x^2}}\end{aligned}$$

```
[Out] 1/4*x*(-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3-45/64*c*x*arcsin(a*x)*(-a^2*c*x^2+
c)^(1/2)-3/32*c*x*(-a^2*x^2+1)*arcsin(a*x)*(-a^2*c*x^2+c)^(1/2)+3/16*c*(-a^
2*x^2+1)^(3/2)*arcsin(a*x)^2*(-a^2*c*x^2+c)^(1/2)/a+3/8*c*x*arcsin(a*x)^3*(
-a^2*c*x^2+c)^(1/2)+51/128*a*c*x^2*(-a^2*c*x^2+c)^(1/2)/(-a^2*x^2+1)^(1/2)-
3/128*a^3*c*x^4*(-a^2*c*x^2+c)^(1/2)/(-a^2*x^2+1)^(1/2)+27/128*c*arcsin(a*x
)^2*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-9/16*a*c*x^2*arcsin(a*x)^2*(-
a^2*c*x^2+c)^(1/2)/(-a^2*x^2+1)^(1/2)+3/32*c*arcsin(a*x)^4*(-a^2*c*x^2+c)^(
1/2)/a/(-a^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 365, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4743, 4741, 4737, 4723, 4795, 30, 4767, 14}

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^3\,dx=-\frac{9acx^2\arcsin(ax)^2\sqrt{c-a^2cx^2}}{16\sqrt{1-a^2x^2}}+\frac{1}{4}x\arcsin(ax)^3\left(c-a^2cx^2\right)^{3/2}+\frac{3}{8}cx\arcsin(ax)^3\sqrt{c-a^2cx^2}-\frac{45}{64}cx\arcsin(ax)\sqrt{c-a^2cx^2}-\frac{3}{32}cx\left(1-a^2x^2\right)\arcsin(ax)\sqrt{c-a^2cx^2}+\frac{3c\arcsin(ax)^4\sqrt{c-a^2cx^2}}{32a\sqrt{1-a^2x^2}}+\frac{3c(1-a^2x^2)^{3/2}\arcsin(ax)^2\sqrt{c-a^2cx^2}}{16a}+\frac{27c\arcsin(ax)^2\sqrt{c-a^2cx^2}}{128a\sqrt{1-a^2x^2}}+\frac{51acx^2\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}-\frac{3a^3cx^4\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}}$$

```
[In] Int[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^3,x]
```

```
[Out] (51*a*c*x^2*Sqrt[c - a^2*c*x^2])/(128*Sqrt[1 - a^2*x^2]) - (3*a^3*c*x^4*Sqr
t[c - a^2*c*x^2])/(128*Sqrt[1 - a^2*x^2]) - (45*c*x*Sqrt[c - a^2*c*x^2]*Arc
Sin[a*x])/64 - (3*c*x*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x])/32 + (
27*c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(128*a*Sqrt[1 - a^2*x^2]) - (9*a*c*
x^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(16*Sqrt[1 - a^2*x^2]) + (3*c*(1 - a
^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(16*a) + (3*c*x*Sqrt[c - a
^2*c*x^2]*ArcSin[a*x]^3)/8 + (x*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^3)/4 + (3
*c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^4)/(32*a*Sqrt[1 - a^2*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^3+\frac{1}{4}(3c)\int\sqrt{c-a^2cx^2}\arcsin(ax)^3\,dx - \frac{\left(3ac\sqrt{c-a^2cx^2}\right)\int x(1-a^2x^2)\arcsin(ax)^2\,dx}{4\sqrt{1-a^2x^2}}$$

$$= \frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{16a}+\frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^3 + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^3-\frac{\left(3c\sqrt{c-a^2cx^2}\right)\int(1-a^2x^2)^{3/2}\arcsin(ax)\,dx}{8\sqrt{1-a^2x^2}} + \frac{\left(3c\sqrt{c-a^2cx^2}\right)\int\frac{\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{8\sqrt{1-a^2x^2}}-\frac{\left(9ac\sqrt{c-a^2cx^2}\right)\int x\arcsin(ax)^2\,dx}{8\sqrt{1-a^2x^2}}$$

$$= -\frac{3}{32}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\arcsin(ax)-\frac{9acx^2\sqrt{c-a^2cx^2}\arcsin(ax)^2}{16\sqrt{1-a^2x^2}} + \frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{16a} + \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^3+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^3 + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^4}{32a\sqrt{1-a^2x^2}}-\frac{\left(9c\sqrt{c-a^2cx^2}\right)\int\sqrt{1-a^2x^2}\arcsin(ax)\,dx}{32\sqrt{1-a^2x^2}} + \frac{\left(3ac\sqrt{c-a^2cx^2}\right)\int x\left(1-a^2x^2\right)\,dx}{32\sqrt{1-a^2x^2}}+\frac{\left(9a^2c\sqrt{c-a^2cx^2}\right)\int\frac{x^2\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{8\sqrt{1-a^2x^2}}$$

$$= -\frac{45}{64}cx\sqrt{c-a^2cx^2}\arcsin(ax)-\frac{3}{32}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\arcsin(ax) - \frac{9acx^2\sqrt{c-a^2cx^2}\arcsin(ax)^2}{16\sqrt{1-a^2x^2}}+\frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{16a} + \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^3+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^3 + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^4}{32a\sqrt{1-a^2x^2}}-\frac{\left(9c\sqrt{c-a^2cx^2}\right)\int\frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{64\sqrt{1-a^2x^2}} + \frac{\left(9c\sqrt{c-a^2cx^2}\right)\int\frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{16\sqrt{1-a^2x^2}}+\frac{\left(3ac\sqrt{c-a^2cx^2}\right)\int\left(x-a^2x^3\right)\,dx}{32\sqrt{1-a^2x^2}} + \frac{\left(9ac\sqrt{c-a^2cx^2}\right)\int x\,dx}{64\sqrt{1-a^2x^2}}+\frac{\left(9ac\sqrt{c-a^2cx^2}\right)\int x\,dx}{16\sqrt{1-a^2x^2}}$$

$$= \frac{51acx^2\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}} - \frac{3a^3cx^4\sqrt{c-a^2cx^2}}{128\sqrt{1-a^2x^2}} - \frac{45}{64}cx\sqrt{c-a^2cx^2}\arcsin(ax) - \frac{3}{32}cx(1-a^2x^2)\sqrt{c-a^2cx^2}\arcsin(ax) + \frac{27c\sqrt{c-a^2cx^2}\arcsin(ax)^2}{128a\sqrt{1-a^2x^2}} - \frac{9acx^2\sqrt{c-a^2cx^2}\arcsin(ax)^2}{16\sqrt{1-a^2x^2}} + \frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^2}{16a} + \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^3 + \frac{1}{4}x(c-a^2cx^2)^{3/2}\arcsin(ax)^3 + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^4}{32a\sqrt{1-a^2x^2}}$$

Mathematica [A] (verified)

Time = 0.32 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.38

$$\int (c-a^2cx^2)^{3/2}\arcsin(ax)^3\,dx = \frac{c\sqrt{c-a^2cx^2}(96\arcsin(ax)^4 + 24\arcsin(ax)^2(16\cos(2\arcsin(ax)) + \cos(4\arcsi$$

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^3,x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(96*ArcSin[a*x]^4 + 24*ArcSin[a*x]^2*(16*Cos[2*ArcSi
n[a*x]] + Cos[4*ArcSin[a*x]]) - 3*(64*Cos[2*ArcSin[a*x]] + Cos[4*ArcSin[a*x
]]) + 32*ArcSin[a*x]^3*(8*Sin[2*ArcSin[a*x]] + Sin[4*ArcSin[a*x]]) - 12*Arc
Sin[a*x]*(32*Sin[2*ArcSin[a*x]] + Sin[4*ArcSin[a*x]])))/(1024*a*Sqrt[1 - a^
2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.16 (sec) , antiderivative size = 474, normalized size of antiderivative = 1.30

method	result
default	$-\frac{3\sqrt{-c(a^2x^2-1)}\sqrt{-a^2x^2+1}\arcsin(ax)^4c}{32a(a^2x^2-1)} - \frac{\sqrt{-c(a^2x^2-1)}\left(-8i\sqrt{-a^2x^2+1}\,a^4x^4+8a^5x^5+8i\sqrt{-a^2x^2+1}\,a^2x^2-12a^3x^3-i\sqrt{-a\right.}{2048a(a^2x^2-1)}$

```
[In] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -3/32*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/(a^2*x^2-1)*arcsin(a*x)^4
*c-1/2048*(-c*(a^2*x^2-1))^(1/2)*(-8*I*(-a^2*x^2+1)^(1/2)*a^4*x^4+8*a^5*x^5
+8*I*(-a^2*x^2+1)^(1/2)*a^2*x^2-12*a^3*x^3-I*(-a^2*x^2+1)^(1/2)+4*a*x)*(24*
I*arcsin(a*x)^2+32*arcsin(a*x)^3-3*I-12*arcsin(a*x))*c/a/(a^2*x^2-1)+1/32*(
-c*(a^2*x^2-1))^(1/2)*(2*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+2*a^3*x^3-I*(-a^2*x^2
```

```
+1)^(1/2)-2*a*x)*(-6*I*arcsin(a*x)^2+4*arcsin(a*x)^3+3*I-6*arcsin(a*x))*c/a
/(a^2*x^2-1)-1/2048*(-c*(a^2*x^2-1))^(1/2)*(I*a^2*x^2-a*x*(-a^2*x^2+1)^(1/2
)-I)*(408*I*arcsin(a*x)^2+224*arcsin(a*x)^3-195*I-372*arcsin(a*x))*cos(3*ar
csin(a*x))*c/a/(a^2*x^2-1)+9/2048*(-c*(a^2*x^2-1))^(1/2)*(I*(-a^2*x^2+1)^(1
/2)*a*x+a^2*x^2-1)*(40*I*arcsin(a*x)^2+32*arcsin(a*x)^3-21*I-44*arcsin(a*x)
)*sin(3*arcsin(a*x))*c/a/(a^2*x^2-1)
```

Fricas [F]

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^3\,dx=\int \left(-a^2cx^2+c\right)^{\frac{3}{2}}\arcsin\left(ax\right)^3\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3,x, algorithm="fricas")
[Out] integral(-(a^2*c*x^2 - c)*sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3, x)
```

Sympy [F]

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^3\,dx=\int \left(-c(ax-1)\left(ax+1\right)\right)^{\frac{3}{2}}\operatorname{asin}^3\left(ax\right)dx$$

```
[In] integrate((-a**2*c*x**2+c)**(3/2)*asin(a*x)**3,x)
[Out] Integral((-c*(a*x - 1)*(a*x + 1))**(3/2)*asin(a*x)**3, x)
```

Maxima [F]

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^3\,dx=\int \left(-a^2cx^2+c\right)^{\frac{3}{2}}\arcsin\left(ax\right)^3\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3,x, algorithm="maxima")
[Out] integrate((-a^2*c*x^2 + c)^(3/2)*arcsin(a*x)^3, x)
```

Giac [F(-2)]

Exception generated.

$$\int \left(c - a^2cx^2\right)^{3/2} \arcsin(ax)^3 \, dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \left(c - a^2cx^2\right)^{3/2} \arcsin(ax)^3 \, dx = \int \mathrm{asin}(a\,x)^3 \left(c - a^2\,c\,x^2\right)^{3/2} \, dx$$

```
[In] int(asin(a*x)^3*(c - a^2*c*x^2)^(3/2),x)
```

```
[Out] int(asin(a*x)^3*(c - a^2*c*x^2)^(3/2), x)
```

3.297 $\int \sqrt{c-a^2cx^2}\arcsin(ax)^3\,dx$

Optimal result

Integrand size = 22, antiderivative size = 215

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^3\,dx=\frac{3ax^2\sqrt{c-a^2cx^2}}{8\sqrt{1-a^2x^2}}-\frac{3}{4}x\sqrt{c-a^2cx^2}\arcsin(ax)+\frac{3\sqrt{c-a^2cx^2}\arcsin(ax)^2}{8a\sqrt{1-a^2x^2}}-\frac{3ax^2\sqrt{c-a^2cx^2}\arcsin(ax)^2}{4\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^3+\frac{\sqrt{c-a^2cx^2}\arcsin(ax)^4}{8a\sqrt{1-a^2x^2}}$$

```
[Out] -3/4*x*arcsin(a*x)*(-a^2*c*x^2+c)^(1/2)+1/2*x*arcsin(a*x)^3*(-a^2*c*x^2+c)^
(1/2)+3/8*a*x^2*(-a^2*c*x^2+c)^(1/2)/(-a^2*x^2+1)^(1/2)+3/8*arcsin(a*x)^2*(
-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-3/4*a*x^2*arcsin(a*x)^2*(-a^2*c*x^
2+c)^(1/2)/(-a^2*x^2+1)^(1/2)+1/8*arcsin(a*x)^4*(-a^2*c*x^2+c)^(1/2)/a/(-a^
2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4741, 4737, 4723, 4795, 30}

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^3\,dx=\frac{\arcsin(ax)^4\sqrt{c-a^2cx^2}}{8a\sqrt{1-a^2x^2}}+\frac{1}{2}x\arcsin(ax)^3\sqrt{c-a^2cx^2}-\frac{3ax^2\arcsin(ax)^2\sqrt{c-a^2cx^2}}{4\sqrt{1-a^2x^2}}+\frac{3\arcsin(ax)^2\sqrt{c-a^2cx^2}}{8a\sqrt{1-a^2x^2}}-\frac{3}{4}x\arcsin(ax)\sqrt{c-a^2cx^2}+\frac{3ax^2\sqrt{c-a^2cx^2}}{8\sqrt{1-a^2x^2}}$$

```
[In] Int[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^3,x]
```

```
[Out] (3*a*x^2*Sqrt[c - a^2*c*x^2])/(8*Sqrt[1 - a^2*x^2]) - (3*x*Sqrt[c - a^2*c*x
^2]*ArcSin[a*x])/4 + (3*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(8*a*Sqrt[1 - a^
2*x^2]) - (3*a*x^2*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^2)/(4*Sqrt[1 - a^2*x^2])
 + (x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^3)/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a*
x]^4)/(8*a*Sqrt[1 - a^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^3 + \frac{\sqrt{c-a^2cx^2}\int \frac{\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{2\sqrt{1-a^2x^2}} \\
&\quad - \frac{\left(3a\sqrt{c-a^2cx^2}\right)\int x\arcsin(ax)^2\,dx}{2\sqrt{1-a^2x^2}} \\
&= -\frac{3ax^2\sqrt{c-a^2cx^2}\arcsin(ax)^2}{4\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^3 \\
&\quad + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^4}{8a\sqrt{1-a^2x^2}} + \frac{\left(3a^2\sqrt{c-a^2cx^2}\right)\int \frac{x^2\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{2\sqrt{1-a^2x^2}} \\
&= -\frac{3}{4}x\sqrt{c-a^2cx^2}\arcsin(ax) - \frac{3ax^2\sqrt{c-a^2cx^2}\arcsin(ax)^2}{4\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^3 \\
&\quad + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^4}{8a\sqrt{1-a^2x^2}} + \frac{\left(3\sqrt{c-a^2cx^2}\right)\int \frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{4\sqrt{1-a^2x^2}} + \frac{\left(3a\sqrt{c-a^2cx^2}\right)\int x\,dx}{4\sqrt{1-a^2x^2}} \\
&= \frac{3ax^2\sqrt{c-a^2cx^2}}{8\sqrt{1-a^2x^2}} - \frac{3}{4}x\sqrt{c-a^2cx^2}\arcsin(ax) \\
&\quad + \frac{3\sqrt{c-a^2cx^2}\arcsin(ax)^2}{8a\sqrt{1-a^2x^2}} - \frac{3ax^2\sqrt{c-a^2cx^2}\arcsin(ax)^2}{4\sqrt{1-a^2x^2}} \\
&\quad + \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^3 + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^4}{8a\sqrt{1-a^2x^2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.53

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^3\,dx = \frac{\sqrt{c-a^2cx^2}\left(3a^2x^2-6ax\sqrt{1-a^2x^2}\arcsin(ax)+(3-6a^2x^2)\arcsin(ax)^2+4ax\sqrt{1-a^2x^2}\arcsin(ax)^3+\text{ar}\right.}{8a\sqrt{1-a^2x^2}}$$

```
[In] Integrate[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^3,x]
```

```
[Out] (Sqrt[c - a^2*c*x^2]*(3*a^2*x^2 - 6*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x] + (3
- 6*a^2*x^2)*ArcSin[a*x]^2 + 4*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3 + ArcSin
[a*x]^4))/(8*a*Sqrt[1 - a^2*x^2])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.14 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.21

method	result
default	$-\frac{\sqrt{-c(a^2x^2-1)}\,\sqrt{-a^2x^2+1}\,\arcsin(ax)^4}{8a(a^2x^2-1)}+\frac{\sqrt{-c(a^2x^2-1)}\,\left(-2i\sqrt{-a^2x^2+1}\,a^2x^2+2a^3x^3+i\sqrt{-a^2x^2+1}-2ax\right)\left(6i\arcsin(ax)^2+4\right.}{32a(a^2x^2-1)}$

[In] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^3,x,method=_RETURNVERBOSE)

[Out] -1/8*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/(a^2*x^2-1)*arcsin(a*x)^4+1/32*(-c*(a^2*x^2-1))^(1/2)*(-2*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+2*a^3*x^3+I*(-a^2*x^2+1)^(1/2)-2*a*x)*(6*I*arcsin(a*x)^2+4*arcsin(a*x)^3-3*I-6*arcsin(a*x))/a/(a^2*x^2-1)+1/32*(-c*(a^2*x^2-1))^(1/2)*(2*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+2*a^3*x^3-I*(-a^2*x^2+1)^(1/2)-2*a*x)*(-6*I*arcsin(a*x)^2+4*arcsin(a*x)^3+3*I-6*arcsin(a*x))/a/(a^2*x^2-1)

Fricas [F]

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^3\,dx=\int \sqrt{-a^2cx^2+c}\arcsin\left(ax\right)^3\,dx$$

[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^3,x, algorithm="fricas")

[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3, x)

Sympy [F]

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^3\,dx=\int \sqrt{-c\left(ax-1\right)\left(ax+1\right)}\operatorname{asin}^3\left(ax\right)dx$$

[In] integrate((-a**2*c*x**2+c)**(1/2)*asin(a*x)**3,x)

[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))*asin(a*x)**3, x)

Maxima [F]

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^3\,dx = \int \sqrt{-a^2cx^2+c}\arcsin\left(ax\right)^3\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^3,x, algorithm="maxima")
[Out] integrate(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3, x)
```

Giac [F(-2)]

Exception generated.

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^3\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^3,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^3\,dx = \int \mathrm{asin}(a\,x)^3\,\sqrt{c-a^2\,c\,x^2}\,dx$$

```
[In] int(asin(a*x)^3*(c - a^2*c*x^2)^(1/2),x)
[Out] int(asin(a*x)^3*(c - a^2*c*x^2)^(1/2), x)
```

3.298 $\int \frac{\arcsin(ax)^3}{\sqrt{c-a^2cx^2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 42

$$\int \frac{\arcsin(ax)^3}{\sqrt{c-a^2cx^2}}\,dx=\frac{\sqrt{1-a^2x^2}\arcsin(ax)^4}{4a\sqrt{c-a^2cx^2}}$$

```
[Out] 1/4*arcsin(a*x)^4*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.045, Rules used = {4737}

$$\int \frac{\arcsin(ax)^3}{\sqrt{c-a^2cx^2}}\,dx=\frac{\sqrt{1-a^2x^2}\arcsin(ax)^4}{4a\sqrt{c-a^2cx^2}}$$

```
[In] Int[ArcSin[a*x]^3/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^4)/(4*a*Sqrt[c - a^2*c*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral}=\frac{\sqrt{1-a^2x^2}\arcsin(ax)^4}{4a\sqrt{c-a^2cx^2}}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)^3}{\sqrt{c-a^2cx^2}}\,dx = \frac{\sqrt{1-a^2x^2}\arcsin(ax)^4}{4a\sqrt{c-a^2cx^2}}$$

```
[In] Integrate[ArcSin[a*x]^3/Sqrt[c - a^2*c*x^2],x]
[Out] (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^4)/(4*a*Sqrt[c - a^2*c*x^2])
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 52, normalized size of antiderivative = 1.24

method	result	size
default	$-\frac{\sqrt{-c(a^2x^2-1)}\,\sqrt{-a^2x^2+1}\,\arcsin(ax)^4}{4ac(a^2x^2-1)}$	52

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/4*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c/(a^2*x^2-1)*arcsin(a*x)^
4
```

Fricas [F]

$$\int \frac{\arcsin(ax)^3}{\sqrt{c-a^2cx^2}}\,dx = \int \frac{\arcsin(ax)^3}{\sqrt{-a^2cx^2+c}}\,dx$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3/(a^2*c*x^2 - c), x)
```

Sympy [F]

$$\int \frac{\arcsin(ax)^3}{\sqrt{c-a^2cx^2}}\,dx = \int \frac{\operatorname{asin}^3(ax)}{\sqrt{-c(ax-1)(ax+1)}}\,dx$$

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**(1/2),x)
[Out] Integral(asin(a*x)**3/sqrt(-c*(a*x - 1)*(a*x + 1)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.33

$$\int \frac{\arcsin(ax)^3}{\sqrt{c-a^2cx^2}}\,dx = \frac{\arcsin{(ax)}^4}{4\,a\sqrt{c}}$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] 1/4*arcsin(a*x)^4/(a*sqrt(c))
```

Giac [F]

$$\int \frac{\arcsin(ax)^3}{\sqrt{c-a^2cx^2}}\,dx = \int \frac{\arcsin{(ax)}^3}{\sqrt{-a^2cx^2+c}}\,dx$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^3/sqrt(-a^2*c*x^2 + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^3}{\sqrt{c-a^2cx^2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^3}{\sqrt{c-a^2\,c\,x^2}}\,dx$$

```
[In] int(asin(a*x)^3/(c - a^2*c*x^2)^(1/2),x)
[Out] int(asin(a*x)^3/(c - a^2*c*x^2)^(1/2), x)
```

3.299 $\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 238

$$\begin{aligned}\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{3/2}}\,dx &= \frac{x\arcsin(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\arcsin(ax)^3}{ac\sqrt{c-a^2cx^2}} \\ &+ \frac{3\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}} \\ &- \frac{3i\sqrt{1-a^2x^2}\arcsin(ax)\operatorname{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}} \\ &+ \frac{3\sqrt{1-a^2x^2}\operatorname{PolyLog}\left(3,-e^{2i\arcsin(ax)}\right)}{2ac\sqrt{c-a^2cx^2}}\end{aligned}$$

```
[Out] x*arcsin(a*x)^3/c/(-a^2*c*x^2+c)^(1/2)-I*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)/a
/c/(-a^2*c*x^2+c)^(1/2)+3*arcsin(a*x)^2*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)*
(-a^2*x^2+1)^(1/2)/a/c/(-a^2*c*x^2+c)^(1/2)-3*I*arcsin(a*x)*polylog(2,-(I*a
*x+(-a^2*x^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c/(-a^2*c*x^2+c)^(1/2)+3/2*p
olylog(3,-(I*a*x+(-a^2*x^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c/(-a^2*c*x^2+
c)^(1/2)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4745, 4765, 3800, 2221, 2611, 2320, 6724}

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{3/2}}\,dx = -\frac{3i\sqrt{1-a^2x^2}\arcsin(ax)\,\text{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}} + \frac{3\sqrt{1-a^2x^2}\,\text{PolyLog}\left(3,-e^{2i\arcsin(ax)}\right)}{2ac\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\arcsin(ax)^3}{ac\sqrt{c-a^2cx^2}} + \frac{3\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}}$$

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*ArcSin[a*x]^3)/(c*Sqrt[c - a^2*c*x^2]) - (I*Sqrt[1 - a^2*x^2]*ArcSin[a*x
]^3)/(a*c*Sqrt[c - a^2*c*x^2]) + (3*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2*Log[1 +
 E^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2]) - ((3*I)*Sqrt[1 - a^2*x^
2]*ArcSin[a*x]*PolyLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c*Sqrt[c - a^2*c*x^2]
) + (3*Sqrt[1 - a^2*x^2]*PolyLog[3, -E^((2*I)*ArcSin[a*x])])/(2*a*c*Sqrt[c
- a^2*c*x^2])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x\arcsin(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{\left(3a\sqrt{1-a^2x^2}\right)\int\frac{x\arcsin(ax)^2}{1-a^2x^2}\,dx}{c\sqrt{c-a^2cx^2}}\\
&= \frac{x\arcsin(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{\left(3\sqrt{1-a^2x^2}\right)\mathrm{Subst}\left(\int x^2\tan(x)\,dx,x,\arcsin(ax)\right)}{ac\sqrt{c-a^2cx^2}}\\
&= \frac{x\arcsin(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\arcsin(ax)^3}{ac\sqrt{c-a^2cx^2}} + \frac{\left(6i\sqrt{1-a^2x^2}\right)\mathrm{Subst}\left(\int\frac{e^{2ix}x^2}{1+e^{2ix}}\,dx,x,\arcsin(ax)\right)}{ac\sqrt{c-a^2cx^2}}\\
&= \frac{x\arcsin(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\arcsin(ax)^3}{ac\sqrt{c-a^2cx^2}}\\
&\quad + \frac{3\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}}\\
&\quad - \frac{\left(6\sqrt{1-a^2x^2}\right)\mathrm{Subst}\left(\int x\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(ax)\right)}{ac\sqrt{c-a^2cx^2}}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{x\arcsin(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\arcsin(ax)^3}{ac\sqrt{c-a^2cx^2}} \\
&\quad + \frac{3\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}} \\
&\quad - \frac{3i\sqrt{1-a^2x^2}\arcsin(ax)\,\text{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}} \\
&\quad + \frac{\left(3i\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int \text{PolyLog}\left(2,-e^{2ix}\right)\,dx,x,\arcsin(ax)\right)}{ac\sqrt{c-a^2cx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{x\arcsin(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\arcsin(ax)^3}{ac\sqrt{c-a^2cx^2}} \\
&\quad + \frac{3\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}} \\
&\quad - \frac{3i\sqrt{1-a^2x^2}\arcsin(ax)\,\text{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}} \\
&\quad + \frac{\left(3\sqrt{1-a^2x^2}\right)\text{Subst}\left(\int \frac{\text{PolyLog}(2,-x)}{x}\,dx,x,e^{2i\arcsin(ax)}\right)}{2ac\sqrt{c-a^2cx^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{x\arcsin(ax)^3}{c\sqrt{c-a^2cx^2}} - \frac{i\sqrt{1-a^2x^2}\arcsin(ax)^3}{ac\sqrt{c-a^2cx^2}} \\
&\quad + \frac{3\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}} \\
&\quad - \frac{3i\sqrt{1-a^2x^2}\arcsin(ax)\,\text{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{ac\sqrt{c-a^2cx^2}} \\
&\quad + \frac{3\sqrt{1-a^2x^2}\,\text{PolyLog}\left(3,-e^{2i\arcsin(ax)}\right)}{2ac\sqrt{c-a^2cx^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 157, normalized size of antiderivative = 0.66

$$
\int \frac{\arcsin(ax)^3}{\left(c-a^2cx^2\right)^{3/2}}\,dx = \frac{2\arcsin(ax)^2\left(\left(ax-i\sqrt{1-a^2x^2}\right)\arcsin(ax)+3\sqrt{1-a^2x^2}\log\left(1+e^{2i\arcsin(ax)}\right)\right)-6}{2ac\sqrt{}}
$$

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (2*ArcSin[a*x]^2*((a*x - I*Sqrt[1 - a^2*x^2])*ArcSin[a*x] + 3*Sqrt[1 - a^2*
x^2]*Log[1 + E^((2*I)*ArcSin[a*x])]) - (6*I)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*
PolyLog[2, -E^((2*I)*ArcSin[a*x])] + 3*Sqrt[1 - a^2*x^2]*PolyLog[3, -E^((2*
I)*ArcSin[a*x])])/(2*a*c*Sqrt[c - a^2*c*x^2])
```

Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 203, normalized size of antiderivative = 0.85

method	result
default	$-\frac{\sqrt{-c(a^2x^2-1)}\left(i\sqrt{-a^2x^2+1}+ax\right)\arcsin(ax)^3}{a\,c^2(a^2x^2-1)}+\frac{\sqrt{-a^2x^2+1}\,\sqrt{-c(a^2x^2-1)}\,\left(4i\arcsin(ax)^3-6\arcsin(ax)^2\ln\left(1+\left(iax+\sqrt{-a^2x^2}\right.\right.\right.}{}$

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -(-c*(a^2*x^2-1))^(1/2)*(I*(-a^2*x^2+1)^(1/2)+a*x)*arcsin(a*x)^3/a/c^2/(a^2
*x^2-1)+1/2*(-a^2*x^2+1)^(1/2)*(-c*(a^2*x^2-1))^(1/2)*(4*I*arcsin(a*x)^3-6*
arcsin(a*x)^2*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)+6*I*arcsin(a*x)*polylog(2,
-(I*a*x+(-a^2*x^2+1)^(1/2))^2)-3*polylog(3,-(I*a*x+(-a^2*x^2+1)^(1/2))^2))/
a/c^2/(a^2*x^2-1)
```

Fricas [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\arcsin(ax)^3}{(-a^2cx^2+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3/(a^4*c^2*x^4 - 2*a^2*c^2*x^2 +
c^2), x)
```

Sympy [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\operatorname{asin}^3(ax)}{(-c(ax-1)(ax+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(asin(a*x)**3/(-c*(a*x - 1)*(a*x + 1))**(3/2), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.77 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.21

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{3/2}}\,dx = \frac{x\arcsin\left(ax\right)^3}{\sqrt{-a^2cx^2+c}c} - \frac{3\arcsin\left(ax\right)^2\log\left(x^2-\frac{1}{a^2}\right)}{2\,ac^{\frac{3}{2}}}$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
[Out] x*arcsin(a*x)^3/(sqrt(-a^2*c*x^2 + c)*c) - 3/2*arcsin(a*x)^2*log(x^2 - 1/a^
2)/(a*c^(3/2))
```

Giac [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\arcsin\left(ax\right)^3}{\left(-a^2cx^2+c\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^3/(-a^2*c*x^2 + c)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^3}{\left(c-a^2\,c\,x^2\right)^{3/2}}\,dx$$

```
[In] int(asin(a*x)^3/(c - a^2*c*x^2)^(3/2),x)
[Out] int(asin(a*x)^3/(c - a^2*c*x^2)^(3/2), x)
```

3.300 $\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 388

$$\begin{aligned}\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{5/2}}\,dx &= \frac{x\arcsin(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} \\ &+ \frac{x\arcsin(ax)^3}{3c\,(c-a^2cx^2)^{3/2}} + \frac{2x\arcsin(ax)^3}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)^3}{3ac^2\sqrt{c-a^2cx^2}} \\ &+ \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\log\left(1-a^2x^2\right)}{2ac^2\sqrt{c-a^2cx^2}} \\ &- \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)\operatorname{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}} \\ &+ \frac{\sqrt{1-a^2x^2}\operatorname{PolyLog}\left(3,-e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}}\end{aligned}$$

```
[Out] 1/3*x*arcsin(a*x)^3/c/(-a^2*c*x^2+c)^(3/2)+x*arcsin(a*x)/c^2/(-a^2*c*x^2+c)
^(1/2)+2/3*x*arcsin(a*x)^3/c^2/(-a^2*c*x^2+c)^(1/2)-1/2*arcsin(a*x)^2/a/c^2
/(-a^2*x^2+1)^(1/2)/(-a^2*c*x^2+c)^(1/2)-2/3*I*arcsin(a*x)^3*(-a^2*x^2+1)^(
1/2)/a/c^2/(-a^2*c*x^2+c)^(1/2)+2*arcsin(a*x)^2*ln(1+(I*a*x+(-a^2*x^2+1)^(1
/2))^2)*(-a^2*x^2+1)^(1/2)/a/c^2/(-a^2*c*x^2+c)^(1/2)+1/2*ln(-a^2*x^2+1)*(-
a^2*x^2+1)^(1/2)/a/c^2/(-a^2*c*x^2+c)^(1/2)-2*I*arcsin(a*x)*polylog(2,-(I*a
*x+(-a^2*x^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c^2/(-a^2*c*x^2+c)^(1/2)+pol
ylog(3,-(I*a*x+(-a^2*x^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c^2/(-a^2*c*x^2+
c)^(1/2)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 388, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.455, Rules used = {4747, 4745, 4765, 3800, 2221, 2611, 2320, 6724, 4767, 266}

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{5/2}}\,dx = -\frac{2i\sqrt{1-a^2x^2}\arcsin(ax)\operatorname{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\operatorname{PolyLog}\left(3,-e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}} + \frac{2x\arcsin(ax)^3}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)^3}{3ac^2\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{c^2\sqrt{c-a^2cx^2}} + \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^3}{3c\,(c-a^2cx^2)^{3/2}} + \frac{\sqrt{1-a^2x^2}\log\left(1-a^2x^2\right)}{2ac^2\sqrt{c-a^2cx^2}}$$

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] (x*ArcSin[a*x])/(c^2*Sqrt[c - a^2*c*x^2]) - ArcSin[a*x]^2/(2*a*c^2*Sqrt[1 -
 a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x]^3)/(3*c*(c - a^2*c*x^2)^(3/
2)) + (2*x*ArcSin[a*x]^3)/(3*c^2*Sqrt[c - a^2*c*x^2]) - (((2*I)/3)*Sqrt[1 -
 a^2*x^2]*ArcSin[a*x]^3)/(a*c^2*Sqrt[c - a^2*c*x^2]) + (2*Sqrt[1 - a^2*x^2]
*ArcSin[a*x]^2*Log[1 + E^((2*I)*ArcSin[a*x])])/(a*c^2*Sqrt[c - a^2*c*x^2])
+ (Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2])/(2*a*c^2*Sqrt[c - a^2*c*x^2]) - ((2*
I)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*PolyLog[2, -E^((2*I)*ArcSin[a*x])])/(a*c^2
*Sqrt[c - a^2*c*x^2]) + (Sqrt[1 - a^2*x^2]*PolyLog[3, -E^((2*I)*ArcSin[a*x]
)])/(a*c^2*Sqrt[c - a^2*c*x^2])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
```

```
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
```

```
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x\arcsin(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}}+\frac{2\int\frac{\arcsin(ax)^3}{(c-a^2cx^2)^{3/2}}\,dx}{3c}-\frac{\left(a\sqrt{1-a^2x^2}\right)\int\frac{x\arcsin(ax)^2}{(1-a^2x^2)^2}\,dx}{c^2\sqrt{c-a^2cx^2}}\\
&= -\frac{\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}+\frac{x\arcsin(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}}+\frac{2x\arcsin(ax)^3}{3c^2\sqrt{c-a^2cx^2}}\\
&\quad+\frac{\sqrt{1-a^2x^2}\int\frac{\arcsin(ax)}{(1-a^2x^2)^{3/2}}\,dx}{c^2\sqrt{c-a^2cx^2}}-\frac{\left(2a\sqrt{1-a^2x^2}\right)\int\frac{x\arcsin(ax)^2}{1-a^2x^2}\,dx}{c^2\sqrt{c-a^2cx^2}}\\
&= \frac{x\arcsin(ax)}{c^2\sqrt{c-a^2cx^2}}-\frac{\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}+\frac{x\arcsin(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}}+\frac{2x\arcsin(ax)^3}{3c^2\sqrt{c-a^2cx^2}}\\
&\quad-\frac{\left(2\sqrt{1-a^2x^2}\right)\mathrm{Subst}\left(\int x^2\tan(x)\,dx,x,\arcsin(ax)\right)}{ac^2\sqrt{c-a^2cx^2}}-\frac{\left(a\sqrt{1-a^2x^2}\right)\int\frac{x}{1-a^2x^2}\,dx}{c^2\sqrt{c-a^2cx^2}}\\
&= \frac{x\arcsin(ax)}{c^2\sqrt{c-a^2cx^2}}-\frac{\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}+\frac{x\arcsin(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}}\\
&\quad+\frac{2x\arcsin(ax)^3}{3c^2\sqrt{c-a^2cx^2}}-\frac{2i\sqrt{1-a^2x^2}\arcsin(ax)^3}{3ac^2\sqrt{c-a^2cx^2}}+\frac{\sqrt{1-a^2x^2}\log\left(1-a^2x^2\right)}{2ac^2\sqrt{c-a^2cx^2}}\\
&\quad+\frac{\left(4i\sqrt{1-a^2x^2}\right)\mathrm{Subst}\left(\int\frac{e^{2ix}x^2}{1+e^{2ix}}\,dx,x,\arcsin(ax)\right)}{ac^2\sqrt{c-a^2cx^2}}\\
&= \frac{x\arcsin(ax)}{c^2\sqrt{c-a^2cx^2}}-\frac{\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}+\frac{x\arcsin(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}}+\frac{2x\arcsin(ax)^3}{3c^2\sqrt{c-a^2cx^2}}\\
&\quad-\frac{2i\sqrt{1-a^2x^2}\arcsin(ax)^3}{3ac^2\sqrt{c-a^2cx^2}}+\frac{2\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}}\\
&\quad+\frac{\sqrt{1-a^2x^2}\log\left(1-a^2x^2\right)}{2ac^2\sqrt{c-a^2cx^2}}-\frac{\left(4\sqrt{1-a^2x^2}\right)\mathrm{Subst}\left(\int x\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(ax)\right)}{ac^2\sqrt{c-a^2cx^2}}
\end{aligned}$$

$$= \frac{x \arcsin(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x \arcsin(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\arcsin(ax)^3}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)^3}{3ac^2\sqrt{c-a^2cx^2}} + \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\log\left(1-a^2x^2\right)}{2ac^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)\operatorname{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}} + \frac{\left(2i\sqrt{1-a^2x^2}\right)\operatorname{Subst}\left(\int \operatorname{PolyLog}\left(2,-e^{2ix}\right)\,dx, x, \arcsin(ax)\right)}{ac^2\sqrt{c-a^2cx^2}}$$

$$= \frac{x \arcsin(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x \arcsin(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\arcsin(ax)^3}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)^3}{3ac^2\sqrt{c-a^2cx^2}} + \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\log\left(1-a^2x^2\right)}{2ac^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)\operatorname{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,-x)}{x}\,dx, x, e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}}$$

$$= \frac{x \arcsin(ax)}{c^2\sqrt{c-a^2cx^2}} - \frac{\arcsin(ax)^2}{2ac^2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x \arcsin(ax)^3}{3c\left(c-a^2cx^2\right)^{3/2}} + \frac{2x\arcsin(ax)^3}{3c^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)^3}{3ac^2\sqrt{c-a^2cx^2}} + \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\log\left(1-a^2x^2\right)}{2ac^2\sqrt{c-a^2cx^2}} - \frac{2i\sqrt{1-a^2x^2}\arcsin(ax)\operatorname{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\operatorname{PolyLog}\left(3,-e^{2i\arcsin(ax)}\right)}{ac^2\sqrt{c-a^2cx^2}}$$

Mathematica [A] (verified)

Time = 0.49 (sec) , antiderivative size = 211, normalized size of antiderivative = 0.54

$$\int \frac{\arcsin(ax)^3}{\left(c-a^2cx^2\right)^{5/2}}\,dx = \frac{\left(1-a^2x^2\right)^{3/2}\left(\frac{6ax\arcsin(ax)}{\sqrt{1-a^2x^2}} + \frac{3\arcsin(ax)^2}{-1+a^2x^2} - 4i\arcsin(ax)^3 + \frac{2ax\arcsin(ax)^3}{\left(1-a^2x^2\right)^{3/2}} + \frac{4ax\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\right.}{}$$

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] ((1 - a^2*x^2)^(3/2)*((6*a*x*ArcSin[a*x])/Sqrt[1 - a^2*x^2] + (3*ArcSin[a*x
]^2)/(-1 + a^2*x^2) - (4*I)*ArcSin[a*x]^3 + (2*a*x*ArcSin[a*x]^3)/(1 - a^2*
x^2)^(3/2) + (4*a*x*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2] + 12*ArcSin[a*x]^2*Log
[1 + E^((2*I)*ArcSin[a*x])] + 3*Log[1 - a^2*x^2] - (12*I)*ArcSin[a*x]*PolyL
og[2, -E^((2*I)*ArcSin[a*x])] + 6*PolyLog[3, -E^((2*I)*ArcSin[a*x])]))/(6*a
*c*(c - a^2*c*x^2)^(3/2))
```

Maple [A] (verified)

Time = 0.23 (sec) , antiderivative size = 535, normalized size of antiderivative = 1.38

method	result
default	$-\frac{\sqrt{-c(a^2x^2-1)}\left(2i\sqrt{-a^2x^2+1}\,a^2x^2+2a^3x^3-2i\sqrt{-a^2x^2+1}-3ax\right)\arcsin(ax)\left(-6i\arcsin(ax)a^4x^4-6\arcsin(ax)\sqrt{-a^2x^2+1}\,a^3x^3-\right.}{6}$

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^(5/2),x,method=_RETURNVERBOSE)
[Out] -1/6*(-c*(a^2*x^2-1))^(1/2)*(2*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+2*a^3*x^3-2*I*(
-a^2*x^2+1)^(1/2)-3*a*x)*arcsin(a*x)*(-6*I*arcsin(a*x)*a^4*x^4-6*arcsin(a*x
)*(-a^2*x^2+1)^(1/2)*a^3*x^3+6*I*(-a^2*x^2+1)^(1/2)*a^3*x^3-6*a^4*x^4+6*arc
sin(a*x)^2*a^2*x^2+12*I*arcsin(a*x)*a^2*x^2+9*arcsin(a*x)*(-a^2*x^2+1)^(1/2
)*a*x-6*I*(-a^2*x^2+1)^(1/2)*a*x+18*a^2*x^2-8*arcsin(a*x)^2-6*I*arcsin(a*x)
-12)/c^3/(3*a^6*x^6-10*a^4*x^4+11*a^2*x^2-4)/a+2*(-c*(a^2*x^2-1))^(1/2)*(-a
^2*x^2+1)^(1/2)/a/c^3/(a^2*x^2-1)*ln(I*a*x+(-a^2*x^2+1)^(1/2))-(-c*(a^2*x^2
-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^3/(a^2*x^2-1)*ln(1+(I*a*x+(-a^2*x^2+1)^(1
/2))^2)+1/3*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)*(4*I*arcsin(a*x)^3-6*
arcsin(a*x)^2*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)+6*I*arcsin(a*x)*polylog(2,
-(I*a*x+(-a^2*x^2+1)^(1/2))^2)-3*polylog(3,-(I*a*x+(-a^2*x^2+1)^(1/2))^2))/
a/c^3/(a^2*x^2-1)
```

Fricas [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{5/2}}\,dx=\int \frac{\arcsin\left(ax\right)^3}{\left(-a^2cx^2+c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3/(a^6*c^3*x^6 - 3*a^4*c^3*x^4 +
 3*a^2*c^3*x^2 - c^3), x)
```

Sympy [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{5/2}}\,dx=\int \frac{\operatorname{asin}^3\left(ax\right)}{\left(-c\left(ax-1\right)\left(ax+1\right)\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**(5/2),x)
[Out] Integral(asin(a*x)**3/(-c*(a*x - 1)*(a*x + 1))**(5/2), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.52 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.27

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{5/2}}\,dx = \frac{1}{2}\,a\left(\frac{1}{a^4c^{\frac{5}{2}}x^2-a^2c^{\frac{5}{2}}}+\frac{2\,\log\left(ax+1\right)}{a^2c^{\frac{5}{2}}}+\frac{2\,\log\left(ax-1\right)}{a^2c^{\frac{5}{2}}}\right)\arcsin\left(ax\right)^2 + \frac{1}{3}\left(\frac{2\,x}{\sqrt{-a^2cx^2+c}c^2}+\frac{x}{\left(-a^2cx^2+c\right)^{\frac{3}{2}}c}\right)\arcsin\left(ax\right)^3$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
[Out] 1/2*a*(1/(a^4*c^(5/2)*x^2 - a^2*c^(5/2)) + 2*log(a*x + 1)/(a^2*c^(5/2)) + 2
*log(a*x - 1)/(a^2*c^(5/2)))*arcsin(a*x)^2 + 1/3*(2*x/(sqrt(-a^2*c*x^2 + c)
*c^2) + x/((-a^2*c*x^2 + c)^(3/2)*c))*arcsin(a*x)^3
```

Giac [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{5/2}}\,dx = \int \frac{\arcsin\left(ax\right)^3}{\left(-a^2cx^2+c\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(5/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^3/(-a^2*c*x^2 + c)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{5/2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^3}{\left(c-a^2\,c\,x^2\right)^{5/2}}\,dx$$

```
[In] int(asin(a*x)^3/(c - a^2*c*x^2)^(5/2),x)
[Out] int(asin(a*x)^3/(c - a^2*c*x^2)^(5/2), x)
```

3.301 $\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{7/2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 547

$$\begin{aligned}\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{7/2}}\,dx = & -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}+\frac{x\arcsin(ax)}{c^3\sqrt{c-a^2cx^2}} \\ & +\frac{x\arcsin(ax)}{10c^3(1-a^2x^2)\sqrt{c-a^2cx^2}}-\frac{3\arcsin(ax)^2}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} \\ & -\frac{2\arcsin(ax)^2}{5ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}+\frac{x\arcsin(ax)^3}{5c(c-a^2cx^2)^{5/2}} \\ & +\frac{4x\arcsin(ax)^3}{15c^2(c-a^2cx^2)^{3/2}}+\frac{8x\arcsin(ax)^3}{15c^3\sqrt{c-a^2cx^2}}-\frac{8i\sqrt{1-a^2x^2}\arcsin(ax)^3}{15ac^3\sqrt{c-a^2cx^2}} \\ & +\frac{8\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}}+\frac{\sqrt{1-a^2x^2}\log(1-a^2x^2)}{2ac^3\sqrt{c-a^2cx^2}} \\ & -\frac{8i\sqrt{1-a^2x^2}\arcsin(ax)\operatorname{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}} \\ & +\frac{4\sqrt{1-a^2x^2}\operatorname{PolyLog}\left(3,-e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}}\end{aligned}$$

```
[Out] 1/5*x*arcsin(a*x)^3/c/(-a^2*c*x^2+c)^(5/2)+4/15*x*arcsin(a*x)^3/c^2/(-a^2*c
*x^2+c)^(3/2)+x*arcsin(a*x)/c^3/(-a^2*c*x^2+c)^(1/2)+1/10*x*arcsin(a*x)/c^3
/(-a^2*x^2+1)/(-a^2*c*x^2+c)^(1/2)-3/20*arcsin(a*x)^2/a/c^3/(-a^2*x^2+1)^(3
/2)/(-a^2*c*x^2+c)^(1/2)+8/15*x*arcsin(a*x)^3/c^3/(-a^2*c*x^2+c)^(1/2)-1/20
/a/c^3/(-a^2*x^2+1)^(1/2)/(-a^2*c*x^2+c)^(1/2)-2/5*arcsin(a*x)^2/a/c^3/(-a^
2*x^2+1)^(1/2)/(-a^2*c*x^2+c)^(1/2)-8/15*I*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)
/a/c^3/(-a^2*c*x^2+c)^(1/2)+8/5*arcsin(a*x)^2*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2
))^2)*(-a^2*x^2+1)^(1/2)/a/c^3/(-a^2*c*x^2+c)^(1/2)+1/2*ln(-a^2*x^2+1)*(-a^
2*x^2+1)^(1/2)/a/c^3/(-a^2*c*x^2+c)^(1/2)-8/5*I*arcsin(a*x)*polylog(2,-(I*a
```

```
*x+(-a^2*x^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c^3/(-a^2*c*x^2+c)^(1/2)+4/5
*polylog(3,-(I*a*x+(-a^2*x^2+1)^(1/2))^2)*(-a^2*x^2+1)^(1/2)/a/c^3/(-a^2*c*
x^2+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 547, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4747, 4745, 4765, 3800, 2221, 2611, 2320, 6724, 4767, 266, 267}

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{7/2}}\,dx = -\frac{8i\sqrt{1-a^2x^2}\arcsin(ax)\operatorname{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}} + \frac{4\sqrt{1-a^2x^2}\operatorname{PolyLog}\left(3,-e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}} + \frac{8x\arcsin(ax)^3}{15c^3\sqrt{c-a^2cx^2}} - \frac{8i\sqrt{1-a^2x^2}\arcsin(ax)^3}{15ac^3\sqrt{c-a^2cx^2}} - \frac{2\arcsin(ax)^2}{5ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} - \frac{3\arcsin(ax)^2}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{10c^3(1-a^2x^2)\sqrt{c-a^2cx^2}} + \frac{8\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}} + \frac{4x\arcsin(ax)^3}{15c^2(c-a^2cx^2)^{3/2}} + \frac{x\arcsin(ax)^3}{5c(c-a^2cx^2)^{5/2}} - \frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\log(1-a^2x^2)}{2ac^3\sqrt{c-a^2cx^2}}$$

```
[In] Int[ArcSin[a*x]^3/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] -1/20*1/(a*c^3*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x])/(c^
3*Sqrt[c - a^2*c*x^2]) + (x*ArcSin[a*x])/(10*c^3*(1 - a^2*x^2)*Sqrt[c - a^2
*c*x^2]) - (3*ArcSin[a*x]^2)/(20*a*c^3*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x
^2]) - (2*ArcSin[a*x]^2)/(5*a*c^3*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2]) +
(x*ArcSin[a*x]^3)/(5*c*(c - a^2*c*x^2)^(5/2)) + (4*x*ArcSin[a*x]^3)/(15*c^2
*(c - a^2*c*x^2)^(3/2)) + (8*x*ArcSin[a*x]^3)/(15*c^3*Sqrt[c - a^2*c*x^2])
- (((8*I)/15)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(a*c^3*Sqrt[c - a^2*c*x^2])
+ (8*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2*Log[1 + E^((2*I)*ArcSin[a*x])])/(5*a*c
^3*Sqrt[c - a^2*c*x^2]) + (Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2])/(2*a*c^3*Sqr
t[c - a^2*c*x^2]) - (((8*I)/5)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*PolyLog[2, -E^
((2*I)*ArcSin[a*x])])/(a*c^3*Sqrt[c - a^2*c*x^2]) + (4*Sqrt[1 - a^2*x^2]*Po
lyLog[3, -E^((2*I)*ArcSin[a*x])])/(5*a*c^3*Sqrt[c - a^2*c*x^2])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
```

```
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x\arcsin(ax)^3}{5c\left(c-a^2cx^2\right)^{5/2}}+\frac{4\int\frac{\arcsin(ax)^3}{\left(c-a^2cx^2\right)^{5/2}}\,dx}{5c}-\frac{\left(3a\sqrt{1-a^2x^2}\right)\int\frac{x\arcsin(ax)^2}{\left(1-a^2x^2\right)^3}\,dx}{5c^3\sqrt{c-a^2cx^2}}\\
&=-\frac{3\arcsin(ax)^2}{20ac^3\left(1-a^2x^2\right)^{3/2}\sqrt{c-a^2cx^2}}+\frac{x\arcsin(ax)^3}{5c\left(c-a^2cx^2\right)^{5/2}}\\
&\quad+\frac{4x\arcsin(ax)^3}{15c^2\left(c-a^2cx^2\right)^{3/2}}+\frac{8\int\frac{\arcsin(ax)^3}{\left(c-a^2cx^2\right)^{3/2}}\,dx}{15c^2}+\frac{\left(3\sqrt{1-a^2x^2}\right)\int\frac{\arcsin(ax)}{\left(1-a^2x^2\right)^{5/2}}\,dx}{10c^3\sqrt{c-a^2cx^2}}\\
&\quad-\frac{\left(4a\sqrt{1-a^2x^2}\right)\int\frac{x\arcsin(ax)^2}{\left(1-a^2x^2\right)^2}\,dx}{5c^3\sqrt{c-a^2cx^2}}
\end{aligned}$$

$$= \frac{x\arcsin(ax)}{10c^3(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{3\arcsin(ax)^2}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2\arcsin(ax)^2}{5ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^3}{5c(c-a^2cx^2)^{5/2}} + \frac{4x\arcsin(ax)^3}{15c^2(c-a^2cx^2)^{3/2}} + \frac{8x\arcsin(ax)^3}{15c^3\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\int\frac{\arcsin(ax)}{(1-a^2x^2)^{3/2}}dx}{5c^3\sqrt{c-a^2cx^2}} + \frac{\left(4\sqrt{1-a^2x^2}\right)\int\frac{\arcsin(ax)}{(1-a^2x^2)^{3/2}}dx}{5c^3\sqrt{c-a^2cx^2}} - \frac{\left(a\sqrt{1-a^2x^2}\right)\int\frac{x}{(1-a^2x^2)^2}dx}{10c^3\sqrt{c-a^2cx^2}} - \frac{\left(8a\sqrt{1-a^2x^2}\right)\int\frac{x\arcsin(ax)^2}{1-a^2x^2}dx}{5c^3\sqrt{c-a^2cx^2}}$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{10c^3(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{3\arcsin(ax)^2}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2\arcsin(ax)^2}{5ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^3}{5c(c-a^2cx^2)^{5/2}} + \frac{4x\arcsin(ax)^3}{15c^2(c-a^2cx^2)^{3/2}} + \frac{8x\arcsin(ax)^3}{15c^3\sqrt{c-a^2cx^2}} - \frac{\left(8\sqrt{1-a^2x^2}\right)\mathrm{Subst}\left(\int x^2\tan(x)\,dx, x, \arcsin(ax)\right)}{5ac^3\sqrt{c-a^2cx^2}} - \frac{\left(a\sqrt{1-a^2x^2}\right)\int\frac{x}{1-a^2x^2}dx}{5c^3\sqrt{c-a^2cx^2}} - \frac{\left(4a\sqrt{1-a^2x^2}\right)\int\frac{x}{1-a^2x^2}dx}{5c^3\sqrt{c-a^2cx^2}}$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{10c^3(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{3\arcsin(ax)^2}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2\arcsin(ax)^2}{5ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^3}{5c(c-a^2cx^2)^{5/2}} + \frac{4x\arcsin(ax)^3}{15c^2(c-a^2cx^2)^{3/2}} + \frac{8x\arcsin(ax)^3}{15c^3\sqrt{c-a^2cx^2}} - \frac{8i\sqrt{1-a^2x^2}\arcsin(ax)^3}{15ac^3\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\log(1-a^2x^2)}{2ac^3\sqrt{c-a^2cx^2}} + \frac{\left(16i\sqrt{1-a^2x^2}\right)\mathrm{Subst}\left(\int\frac{e^{2ix}x^2}{1+e^{2ix}}dx, x, \arcsin(ax)\right)}{5ac^3\sqrt{c-a^2cx^2}}$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{10c^3(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{3\arcsin(ax)^2}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2\arcsin(ax)^2}{5ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^3}{5c(c-a^2cx^2)^{5/2}} + \frac{4x\arcsin(ax)^3}{15c^2(c-a^2cx^2)^{3/2}} + \frac{8x\arcsin(ax)^3}{15c^3\sqrt{c-a^2cx^2}} - \frac{8i\sqrt{1-a^2x^2}\arcsin(ax)^3}{15ac^3\sqrt{c-a^2cx^2}} + \frac{8\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\log(1-a^2x^2)}{2ac^3\sqrt{c-a^2cx^2}} - \frac{\left(16\sqrt{1-a^2x^2}\right)\mathrm{Subst}\left(\int x\log\left(1+e^{2ix}\right)dx, x, \arcsin(ax)\right)}{5ac^3\sqrt{c-a^2cx^2}}$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{10c^3(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{3\arcsin(ax)^2}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2\arcsin(ax)^2}{5ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^3}{5c(c-a^2cx^2)^{5/2}} + \frac{4x\arcsin(ax)^3}{15c^2(c-a^2cx^2)^{3/2}} + \frac{8x\arcsin(ax)^3}{15c^3\sqrt{c-a^2cx^2}} - \frac{8i\sqrt{1-a^2x^2}\arcsin(ax)^3}{15ac^3\sqrt{c-a^2cx^2}} + \frac{8\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\log(1-a^2x^2)}{2ac^3\sqrt{c-a^2cx^2}} - \frac{8i\sqrt{1-a^2x^2}\arcsin(ax)\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}} + \frac{\left(8i\sqrt{1-a^2x^2}\right)\mathrm{Subst}\left(\int \mathrm{PolyLog}\left(2,-e^{2ix}\right)\,dx, x, \arcsin(ax)\right)}{5ac^3\sqrt{c-a^2cx^2}}$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{10c^3(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{3\arcsin(ax)^2}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2\arcsin(ax)^2}{5ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^3}{5c(c-a^2cx^2)^{5/2}} + \frac{4x\arcsin(ax)^3}{15c^2(c-a^2cx^2)^{3/2}} + \frac{8x\arcsin(ax)^3}{15c^3\sqrt{c-a^2cx^2}} - \frac{8i\sqrt{1-a^2x^2}\arcsin(ax)^3}{15ac^3\sqrt{c-a^2cx^2}} + \frac{8\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\log(1-a^2x^2)}{2ac^3\sqrt{c-a^2cx^2}} - \frac{8i\sqrt{1-a^2x^2}\arcsin(ax)\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}} + \frac{\left(4\sqrt{1-a^2x^2}\right)\mathrm{Subst}\left(\int \frac{\mathrm{PolyLog}(2,-x)}{x}\,dx, x, e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}}$$

$$= -\frac{1}{20ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{c^3\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)}{10c^3(1-a^2x^2)\sqrt{c-a^2cx^2}} - \frac{3\arcsin(ax)^2}{20ac^3(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}} - \frac{2\arcsin(ax)^2}{5ac^3\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}} + \frac{x\arcsin(ax)^3}{5c(c-a^2cx^2)^{5/2}} + \frac{4x\arcsin(ax)^3}{15c^2(c-a^2cx^2)^{3/2}} + \frac{8x\arcsin(ax)^3}{15c^3\sqrt{c-a^2cx^2}} - \frac{8i\sqrt{1-a^2x^2}\arcsin(ax)^3}{15ac^3\sqrt{c-a^2cx^2}} + \frac{8\sqrt{1-a^2x^2}\arcsin(ax)^2\log\left(1+e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}} + \frac{\sqrt{1-a^2x^2}\log(1-a^2x^2)}{2ac^3\sqrt{c-a^2cx^2}} - \frac{8i\sqrt{1-a^2x^2}\arcsin(ax)\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}} + \frac{4\sqrt{1-a^2x^2}\,\mathrm{PolyLog}\left(3,-e^{2i\arcsin(ax)}\right)}{5ac^3\sqrt{c-a^2cx^2}}$$

Mathematica [A] (verified)

Time = 0.69 (sec) , antiderivative size = 319, normalized size of antiderivative = 0.58

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{7/2}}\,dx = \frac{-\frac{3}{\sqrt{1-a^2x^2}} + 60ax\arcsin(ax) + \frac{6ax\arcsin(ax)}{1-a^2x^2} - \frac{9\arcsin(ax)^2}{(1-a^2x^2)^{3/2}} - \frac{24\arcsin(ax)^2}{\sqrt{1-a^2x^2}} + 32ax\arcsin(}{}$$

```
[In] Integrate[ArcSin[a*x]^3/(c - a^2*c*x^2)^(7/2),x]
```

```
[Out] (-3/Sqrt[1 - a^2*x^2] + 60*a*x*ArcSin[a*x] + (6*a*x*ArcSin[a*x])/(1 - a^2*x
^2) - (9*ArcSin[a*x]^2)/(1 - a^2*x^2)^(3/2) - (24*ArcSin[a*x]^2)/Sqrt[1 - a
^2*x^2] + 32*a*x*ArcSin[a*x]^3 + (16*a*x*ArcSin[a*x]^3)/(1 - a^2*x^2) - (32
*I)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3 + (12*a*x*ArcSin[a*x]^3)/(-1 + a^2*x^2)
^2 + 96*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^2*Log[1 + E^((2*I)*ArcSin[a*x])] + 30
*Sqrt[1 - a^2*x^2]*Log[1 - a^2*x^2] - (96*I)*Sqrt[1 - a^2*x^2]*ArcSin[a*x]*
PolyLog[2, -E^((2*I)*ArcSin[a*x])] + 48*Sqrt[1 - a^2*x^2]*PolyLog[3, -E^((2
*I)*ArcSin[a*x])])/(60*a*c^3*Sqrt[c - a^2*c*x^2])
```

Maple [A] (verified)

Time = 0.29 (sec) , antiderivative size = 891, normalized size of antiderivative = 1.63

method	result
default	$-\frac{\sqrt{-c(a^2x^2-1)}\left(8a^5x^5-20a^3x^3+8i\sqrt{-a^2x^2+1}\,a^4x^4+15ax-16i\sqrt{-a^2x^2+1}\,a^2x^2+8i\sqrt{-a^2x^2+1}\right)\left(1590a^4x^4\arcsin(ax)-1410a^2\right.}{}$

```
[In] int(arcsin(a*x)^3/(-a^2*c*x^2+c)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/60*(-c*(a^2*x^2-1))^(1/2)*(8*a^5*x^5-20*a^3*x^3+8*I*(-a^2*x^2+1)^(1/2)*a
^4*x^4+15*a*x-16*I*(-a^2*x^2+1)^(1/2)*a^2*x^2+8*I*(-a^2*x^2+1)^(1/2))*(1590
*a^4*x^4*arcsin(a*x)-1410*a^2*x^2*arcsin(a*x)+105*a^3*x^3*(-a^2*x^2+1)^(1/2
)-45*a*x*(-a^2*x^2+1)^(1/2)-84*(-a^2*x^2+1)^(1/2)*a^5*x^5-744*arcsin(a*x)^2
*(-a^2*x^2+1)^(1/2)*a^5*x^5+192*arcsin(a*x)*a^8*x^8-852*arcsin(a*x)*a^6*x^6
+160*arcsin(a*x)^3*a^4*x^4-380*arcsin(a*x)^3*a^2*x^2+144*I*a^4*x^4+24*I+256
*arcsin(a*x)^3+480*arcsin(a*x)+24*I*a^8*x^8-96*I*a^6*x^6-96*I*a^2*x^2+1020*
arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a^3*x^3-495*arcsin(a*x)^2*(-a^2*x^2+1)^(1/
2)*a*x+192*I*arcsin(a*x)^2*a^8*x^8-840*I*arcsin(a*x)^2*a^6*x^6+1368*I*arcsi
n(a*x)^2*a^4*x^4-984*I*arcsin(a*x)^2*a^2*x^2+192*arcsin(a*x)^2*(-a^2*x^2+1)
^(1/2)*a^7*x^7+264*I*arcsin(a*x)^2-936*I*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a^3
*x^3+372*I*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a*x-192*I*arcsin(a*x)*(-a^2*x^2+1
)^(1/2)*a^7*x^7+756*I*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a^5*x^5+24*(-a^2*x^2+1
)^(1/2)*a^7*x^7)/c^4/(40*a^10*x^10-215*a^8*x^8+469*a^6*x^6-517*a^4*x^4+287*
a^2*x^2-64)/a+2*(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c^4/(a^2*x^2-1)
*ln(I*a*x+(-a^2*x^2+1)^(1/2))-(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)/a/c
```

```
^4/(a^2*x^2-1)*ln(1+(I*a*x+(-a^2*x^2+1)^(1/2))^2)+4/15*(-c*(a^2*x^2-1))^(1/
2)*(-a^2*x^2+1)^(1/2)*(4*I*arcsin(a*x)^3-6*arcsin(a*x)^2*ln(1+(I*a*x+(-a^2*
x^2+1)^(1/2))^2)+6*I*arcsin(a*x)*polylog(2,-(I*a*x+(-a^2*x^2+1)^(1/2))^2)-3
*polylog(3,-(I*a*x+(-a^2*x^2+1)^(1/2))^2))/a/c^4/(a^2*x^2-1)
```

Fricas [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{7/2}}\,dx = \int \frac{\arcsin\left(ax\right)^3}{\left(-a^2cx^2+c\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(7/2),x, algorithm="fricas")
[Out] integral(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^3/(a^8*c^4*x^8 - 4*a^6*c^4*x^6 +
6*a^4*c^4*x^4 - 4*a^2*c^4*x^2 + c^4), x)
```

Sympy [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{7/2}}\,dx = \int \frac{\operatorname{asin}^3\left(ax\right)}{\left(-c\left(ax-1\right)\left(ax+1\right)\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(asin(a*x)**3/(-a**2*c*x**2+c)**(7/2),x)
[Out] Integral(asin(a*x)**3/(-c*(a*x - 1)*(a*x + 1))**(7/2), x)
```

Maxima [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{7/2}}\,dx = \int \frac{\arcsin\left(ax\right)^3}{\left(-a^2cx^2+c\right)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(7/2),x, algorithm="maxima")
[Out] integrate(arcsin(a*x)^3/(-a^2*c*x^2 + c)^(7/2), x)
```

Giac [F]

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{7/2}}\,dx = \int \frac{\arcsin{(ax)}^3}{(-a^2cx^2+c)^{\frac{7}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*c*x^2+c)^(7/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^3/(-a^2*c*x^2 + c)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^3}{(c-a^2cx^2)^{7/2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^3}{(c-a^2\,c\,x^2)^{7/2}}\,dx$$

```
[In] int(asin(a*x)^3/(c - a^2*c*x^2)^(7/2),x)
[Out] int(asin(a*x)^3/(c - a^2*c*x^2)^(7/2), x)
```

3.302 $\int \frac{x^m \arcsin(ax)^3}{\sqrt{1-a^2x^2}} \, dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{x^m \arcsin(ax)^3}{\sqrt{1-a^2x^2}} \, dx = \text{Int}\left(\frac{x^m \arcsin(ax)^3}{\sqrt{1-a^2x^2}}, x\right)$$

```
[Out] Unintegrable(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m \arcsin(ax)^3}{\sqrt{1-a^2x^2}} \, dx = \int \frac{x^m \arcsin(ax)^3}{\sqrt{1-a^2x^2}} \, dx$$

```
[In] Int[(x^m*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] Defer[Int][(x^m*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2], x]
```

Rubi steps

$$\text{integral} = \int \frac{x^m \arcsin(ax)^3}{\sqrt{1-a^2x^2}} \, dx$$

Mathematica [N/A]

Not integrable

Time = 0.96 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{x^m \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx$$

```
[In] Integrate[(x^m*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
[Out] Integrate[(x^m*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2], x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.20 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{x^m \arcsin\left(ax\right)^3}{\sqrt{-a^2x^2+1}}dx$$

```
[In] int(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x)
[Out] int(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.50

$$\int \frac{x^m \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin\left(ax\right)^3}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m*arcsin(a*x)^3/(a^2*x^2 - 1), x)
```

Sympy [N/A]

Not integrable

Time = 2.42 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{x^m \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \operatorname{asin}^3\left(ax\right)}{\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

```
[In] integrate(x**m*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x**m*asin(a*x)**3/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Maxima [N/A]

Not integrable

Time = 0.44 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{x^m \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin{(ax)}^3}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^m*arcsin(a*x)^3/sqrt(-a^2*x^2 + 1), x)
```

Giac [N/A]

Not integrable

Time = 0.67 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{x^m \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin{(ax)}^3}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^m*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(x^m*arcsin(a*x)^3/sqrt(-a^2*x^2 + 1), x)
```

Mupad [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{x^m \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m\,\mathrm{asin}(a\,x)^3}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^m*asin(a*x)^3)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^m*asin(a*x)^3)/(1 - a^2*x^2)^(1/2), x)
```

3.303 $\int \frac{x^4 \arcsin(ax)^3}{\sqrt{1-a^2x^2}} dx$

Optimal result

Integrand size = 24, antiderivative size = 191

$$\int \frac{x^4 \arcsin(ax)^3}{\sqrt{1-a^2x^2}} dx = -\frac{45x^2}{128a^3} - \frac{3x^4}{128a} + \frac{45x\sqrt{1-a^2x^2}\arcsin(ax)}{64a^4} + \frac{3x^3\sqrt{1-a^2x^2}\arcsin(ax)}{32a^2} - \frac{45\arcsin(ax)^2}{128a^5} + \frac{9x^2\arcsin(ax)^2}{16a^3} + \frac{3x^4\arcsin(ax)^2}{16a} - \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)^3}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)^3}{4a^2} + \frac{3\arcsin(ax)^4}{32a^5}$$

```
[Out] -45/128*x^2/a^3-3/128*x^4/a-45/128*arcsin(a*x)^2/a^5+9/16*x^2*arcsin(a*x)^2
/a^3+3/16*x^4*arcsin(a*x)^2/a+3/32*arcsin(a*x)^4/a^5+45/64*x*arcsin(a*x)*(-
a^2*x^2+1)^(1/2)/a^4+3/32*x^3*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^2-3/8*x*arcs
in(a*x)^3*(-a^2*x^2+1)^(1/2)/a^4-1/4*x^3*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)/a
^2
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 191, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used

$= \{4795, 4737, 4723, 30\}$

$$\int \frac{x^4 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{3\arcsin(ax)^4}{32a^5} - \frac{45\arcsin(ax)^2}{128a^5} + \frac{9x^2\arcsin(ax)^2}{16a^3} - \frac{45x^2}{128a^3} - \frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)^3}{4a^2} + \frac{3x^3\sqrt{1-a^2x^2}\arcsin(ax)}{32a^2} - \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)^3}{8a^4} + \frac{45x\sqrt{1-a^2x^2}\arcsin(ax)}{64a^4} + \frac{3x^4\arcsin(ax)^2}{16a} - \frac{3x^4}{128a}$$

```
[In] Int[(x^4*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-45*x^2)/(128*a^3) - (3*x^4)/(128*a) + (45*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]
)/(64*a^4) + (3*x^3*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(32*a^2) - (45*ArcSin[a*
x]^2)/(128*a^5) + (9*x^2*ArcSin[a*x]^2)/(16*a^3) + (3*x^4*ArcSin[a*x]^2)/(1
6*a) - (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(8*a^4) - (x^3*Sqrt[1 - a^2*x^
2]*ArcSin[a*x]^3)/(4*a^2) + (3*ArcSin[a*x]^4)/(32*a^5)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
```

```
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = -\frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)^3}{4a^2} + \frac{3\int \frac{x^2\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{4a^2} + \frac{3\int x^3\arcsin(ax)^2\,dx}{4a}$$
$$= \frac{3x^4\arcsin(ax)^2}{16a} - \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)^3}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)^3}{4a^2} - \frac{3}{8}\int \frac{x^4\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx + \frac{3\int \frac{\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{8a^4} + \frac{9\int x\arcsin(ax)^2\,dx}{8a^3}$$
$$= \frac{3x^3\sqrt{1-a^2x^2}\arcsin(ax)}{32a^2} + \frac{9x^2\arcsin(ax)^2}{16a^3} + \frac{3x^4\arcsin(ax)^2}{16a} - \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)^3}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)^3}{4a^2} + \frac{3\arcsin(ax)^4}{32a^5} - \frac{9\int \frac{x^2\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{32a^2} - \frac{9\int \frac{x^2\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{8a^2} - \frac{3\int x^3\,dx}{32a}$$
$$= -\frac{3x^4}{128a} + \frac{45x\sqrt{1-a^2x^2}\arcsin(ax)}{64a^4} + \frac{3x^3\sqrt{1-a^2x^2}\arcsin(ax)}{32a^2} + \frac{9x^2\arcsin(ax)^2}{16a^3} + \frac{3x^4\arcsin(ax)^2}{16a} - \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)^3}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)^3}{4a^2} + \frac{3\arcsin(ax)^4}{32a^5} - \frac{9\int \frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{64a^4} - \frac{9\int \frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{16a^4} - \frac{9\int x\,dx}{64a^3} - \frac{9\int x\,dx}{16a^3}$$
$$= -\frac{45x^2}{128a^3} - \frac{3x^4}{128a} + \frac{45x\sqrt{1-a^2x^2}\arcsin(ax)}{64a^4} + \frac{3x^3\sqrt{1-a^2x^2}\arcsin(ax)}{32a^2} - \frac{45\arcsin(ax)^2}{128a^5} + \frac{9x^2\arcsin(ax)^2}{16a^3} + \frac{3x^4\arcsin(ax)^2}{16a} - \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)^3}{8a^4} - \frac{x^3\sqrt{1-a^2x^2}\arcsin(ax)^3}{4a^2} + \frac{3\arcsin(ax)^4}{32a^5}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.65

$$\int \frac{x^4\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{-3a^2x^2(15+a^2x^2) + 6ax\sqrt{1-a^2x^2}(15+2a^2x^2)\arcsin(ax) + 3(-15+24a^2x^2+8a^4x^4)\arcsin(ax)^2 - 16}{128a^5}$$

```
[In] Integrate[(x^4*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-3*a^2*x^2*(15 + a^2*x^2) + 6*a*x*Sqrt[1 - a^2*x^2]*(15 + 2*a^2*x^2)*ArcSi
n[a*x] + 3*(-15 + 24*a^2*x^2 + 8*a^4*x^4)*ArcSin[a*x]^2 - 16*a*x*Sqrt[1 - a
^2*x^2]*(3 + 2*a^2*x^2)*ArcSin[a*x]^3 + 12*ArcSin[a*x]^4)/(128*a^5)
```

Maple [A] (verified)

Time = 0.10 (sec) , antiderivative size = 160, normalized size of antiderivative = 0.84

method	result
default	$\frac{-128\arcsin(ax)^3\sqrt{-a^2x^2+1}\,a^3x^3+96a^4x^4\arcsin(ax)^2+48\arcsin(ax)\sqrt{-a^2x^2+1}\,a^3x^3-12a^4x^4-192\arcsin(ax)^3\sqrt{-a^2x^2+1}\,ax+288}{512a^5}$

[In] int(x^4*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/512*(-128*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)*a^3*x^3+96*a^4*x^4*arcsin(a*x)^2+48*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a^3*x^3-12*a^4*x^4-192*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)*a*x+288*arcsin(a*x)^2*a^2*x^2+48*arcsin(a*x)^4+360*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a*x-180*a^2*x^2-180*arcsin(a*x)^2-27)/a^5

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.58

$$\int \frac{x^4\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = -\frac{3\,a^4x^4+45\,a^2x^2-12\,\arcsin\left(ax\right)^4-3\left(8\,a^4x^4+24\,a^2x^2-15\right)\arcsin\left(ax\right)^2+2\,\sqrt{-a^2x^2+1}\left(8\left(2\,a^3x^3+\right.\right.}{128\,a^5}$$

[In] integrate(x^4*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")

[Out] -1/128*(3*a^4*x^4 + 45*a^2*x^2 - 12*arcsin(a*x)^4 - 3*(8*a^4*x^4 + 24*a^2*x^2 - 15)*arcsin(a*x)^2 + 2*sqrt(-a^2*x^2 + 1)*(8*(2*a^3*x^3 + 3*a*x)*arcsin(a*x)^3 - 3*(2*a^3*x^3 + 15*a*x)*arcsin(a*x)))/a^5

Sympy [A] (verification not implemented)

Time = 0.74 (sec) , antiderivative size = 185, normalized size of antiderivative = 0.97

$$\int \frac{x^4\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{3x^4\operatorname{asin}^2(ax)}{16a}-\frac{3x^4}{128a}-\frac{x^3\sqrt{-a^2x^2+1}\operatorname{asin}^3(ax)}{4a^2}+\frac{3x^3\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{32a^2}+\frac{9x^2\operatorname{asin}^2(ax)}{16a^3}-\frac{45x^2}{128a^3}-\frac{3x\sqrt{-a^2x^2+1}\operatorname{asin}^3(ax)}{8a^4}+ \\ 0 \end{cases}$$

[In] integrate(x**4*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)

[Out] Piecewise((3*x**4*asin(a*x)**2/(16*a) - 3*x**4/(128*a) - x**3*sqrt(-a**2*x**2 + 1)*asin(a*x)**3/(4*a**2) + 3*x**3*sqrt(-a**2*x**2 + 1)*asin(a*x)/(32*a

```
**2) + 9*x**2*asin(a*x)**2/(16*a**3) - 45*x**2/(128*a**3) - 3*x*sqrt(-a**2*
x**2 + 1)*asin(a*x)**3/(8*a**4) + 45*x*sqrt(-a**2*x**2 + 1)*asin(a*x)/(64*a
**4) + 3*asin(a*x)**4/(32*a**5) - 45*asin(a*x)**2/(128*a**5), Ne(a, 0)), (0
, True))
```

Maxima [F]

$$\int \frac{x^4 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^4 \arcsin(ax)^3}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^4*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^4*arcsin(a*x)^3/sqrt(-a^2*x^2 + 1), x)
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.01

$$\begin{aligned}\int \frac{x^4 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx &= \frac{(-a^2x^2+1)^{\frac{3}{2}} x \arcsin(ax)^3}{4a^4} - \frac{5\sqrt{-a^2x^2+1}x \arcsin(ax)^3}{8a^4} \\ &\quad - \frac{3(-a^2x^2+1)^{\frac{3}{2}} x \arcsin(ax)}{32a^4} + \frac{3(a^2x^2-1)^2 \arcsin(ax)^2}{16a^5} \\ &\quad + \frac{3\arcsin(ax)^4}{32a^5} + \frac{51\sqrt{-a^2x^2+1}x \arcsin(ax)}{64a^4} \\ &\quad + \frac{15(a^2x^2-1)\arcsin(ax)^2}{16a^5} - \frac{3(a^2x^2-1)^2}{128a^5} \\ &\quad + \frac{51\arcsin(ax)^2}{128a^5} - \frac{51(a^2x^2-1)}{128a^5} - \frac{195}{1024a^5}\end{aligned}$$

```
[In] integrate(x^4*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] 1/4*(-a^2*x^2 + 1)^(3/2)*x*arcsin(a*x)^3/a^4 - 5/8*sqrt(-a^2*x^2 + 1)*x*arc
sin(a*x)^3/a^4 - 3/32*(-a^2*x^2 + 1)^(3/2)*x*arcsin(a*x)/a^4 + 3/16*(a^2*x^
2 - 1)^2*arcsin(a*x)^2/a^5 + 3/32*arcsin(a*x)^4/a^5 + 51/64*sqrt(-a^2*x^2 +
 1)*x*arcsin(a*x)/a^4 + 15/16*(a^2*x^2 - 1)*arcsin(a*x)^2/a^5 - 3/128*(a^2*
x^2 - 1)^2/a^5 + 51/128*arcsin(a*x)^2/a^5 - 51/128*(a^2*x^2 - 1)/a^5 - 195/
1024/a^5
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^4\,\mathrm{asin}(a\,x)^3}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^4*asin(a*x)^3)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^4*asin(a*x)^3)/(1 - a^2*x^2)^(1/2), x)
```

3.304 $\int \frac{x^3 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 157

$$\int \frac{x^3 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = -\frac{40x}{9a^3} - \frac{2x^3}{27a} + \frac{40\sqrt{1-a^2x^2}\arcsin(ax)}{9a^4} + \frac{2x^2\sqrt{1-a^2x^2}\arcsin(ax)}{9a^2} + \frac{2x\arcsin(ax)^2}{a^3} + \frac{x^3\arcsin(ax)^2}{3a} - \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a^4} - \frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a^2}$$

```
[Out] -40/9*x/a^3-2/27*x^3/a+2*x*arcsin(a*x)^2/a^3+1/3*x^3*arcsin(a*x)^2/a+40/9*a
rcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^4+2/9*x^2*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^
2-2/3*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)/a^4-1/3*x^2*arcsin(a*x)^3*(-a^2*x^2+
1)^(1/2)/a^2
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4795, 4767, 4715, 8, 4723, 30}

$$\int \frac{x^3 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{2x\arcsin(ax)^2}{a^3} - \frac{40x}{9a^3} - \frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a^2} + \frac{2x^2\sqrt{1-a^2x^2}\arcsin(ax)}{9a^2} - \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a^4} + \frac{40\sqrt{1-a^2x^2}\arcsin(ax)}{9a^4} + \frac{x^3\arcsin(ax)^2}{3a} - \frac{2x^3}{27a}$$

```
[In] Int[(x^3*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-40*x)/(9*a^3) - (2*x^3)/(27*a) + (40*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(9*a^
4) + (2*x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(9*a^2) + (2*x*ArcSin[a*x]^2)/a^
3 + (x^3*ArcSin[a*x]^2)/(3*a) - (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a^4)
 - (x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(3*a^2)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a^2} + \frac{2\int \frac{x\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{3a^2} + \frac{\int x^2\arcsin(ax)^2\,dx}{a} \\
&= \frac{x^3\arcsin(ax)^2}{3a} - \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a^4} - \frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a^2} \\
&\quad - \frac{2}{3}\int \frac{x^3\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx + \frac{2\int \arcsin(ax)^2\,dx}{a^3} \\
&= \frac{2x^2\sqrt{1-a^2x^2}\arcsin(ax)}{9a^2} + \frac{2x\arcsin(ax)^2}{a^3} + \frac{x^3\arcsin(ax)^2}{3a} - \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a^4} \\
&\quad - \frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a^2} - \frac{4\int \frac{x\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{9a^2} - \frac{4\int \frac{x\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{a^2} - \frac{2\int x^2\,dx}{9a} \\
&= -\frac{2x^3}{27a} + \frac{40\sqrt{1-a^2x^2}\arcsin(ax)}{9a^4} + \frac{2x^2\sqrt{1-a^2x^2}\arcsin(ax)}{9a^2} \\
&\quad + \frac{2x\arcsin(ax)^2}{a^3} + \frac{x^3\arcsin(ax)^2}{3a} - \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a^4} \\
&\quad - \frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a^2} - \frac{4\int 1\,dx}{9a^3} - \frac{4\int 1\,dx}{a^3} \\
&= -\frac{40x}{9a^3} - \frac{2x^3}{27a} + \frac{40\sqrt{1-a^2x^2}\arcsin(ax)}{9a^4} + \frac{2x^2\sqrt{1-a^2x^2}\arcsin(ax)}{9a^2} + \frac{2x\arcsin(ax)^2}{a^3} \\
&\quad + \frac{x^3\arcsin(ax)^2}{3a} - \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a^4} - \frac{x^2\sqrt{1-a^2x^2}\arcsin(ax)^3}{3a^2}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.64

$$
\int \frac{x^3\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx
= \frac{-2ax(60+a^2x^2) + 6\sqrt{1-a^2x^2}(20+a^2x^2)\arcsin(ax) + 9ax(6+a^2x^2)\arcsin(ax)^2 - 9\sqrt{1-a^2x^2}(2+a^2}{27a^4}
$$

```
[In] Integrate[(x^3*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-2*a*x*(60 + a^2*x^2) + 6*Sqrt[1 - a^2*x^2]*(20 + a^2*x^2)*ArcSin[a*x] + 9
*a*x*(6 + a^2*x^2)*ArcSin[a*x]^2 - 9*Sqrt[1 - a^2*x^2]*(2 + a^2*x^2)*ArcSin
[a*x]^3)/(27*a^4)
```

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.15

method	result
default	$-\frac{\left(9 \arcsin(ax)^3 a^4 x^4+9 \arcsin(ax)^3 a^2 x^2+9 \arcsin(ax)^2 \sqrt{-a^2x^2+1}\, a^3 x^3-6 a^4 x^4 \arcsin(ax)-114 a^2 x^2 \arcsin(ax)-2 a^3 x^3 \sqrt{-a^2x^2+1}+\right.}{27 a^4 (a^2x^2-1)}$

```
[In] int(x^3*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/27/a^4*(9*arcsin(a*x)^3*a^4*x^4+9*arcsin(a*x)^3*a^2*x^2+9*arcsin(a*x)^2*
(-a^2*x^2+1)^(1/2)*a^3*x^3-6*a^4*x^4*arcsin(a*x)-114*a^2*x^2*arcsin(a*x)-2*
a^3*x^3*(-a^2*x^2+1)^(1/2)-18*arcsin(a*x)^3+54*arcsin(a*x)^2*(-a^2*x^2+1)^(
1/2)*a*x+120*arcsin(a*x)-120*a*x*(-a^2*x^2+1)^(1/2))*(-a^2*x^2+1)^(1/2)/(a^
2*x^2-1)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.54

$$\int \frac{x^3 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\, dx = -\frac{2\, a^3x^3 - 9\,(a^3x^3 + 6\, ax) \arcsin{(ax)}^2 + 120\, ax + 3\, \sqrt{-a^2x^2+1}\left(3\,(a^2x^2+2) \arcsin{(ax)}^3 - 2\,(a^2x^2+20)\right.}{27\, a^4}$$

```
[In] integrate(x^3*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/27*(2*a^3*x^3 - 9*(a^3*x^3 + 6*a*x)*arcsin(a*x)^2 + 120*a*x + 3*sqrt(-a^
2*x^2 + 1)*(3*(a^2*x^2 + 2)*arcsin(a*x)^3 - 2*(a^2*x^2 + 20)*arcsin(a*x)))/
a^4
```

Sympy [A] (verification not implemented)

Time = 0.55 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.94

$$\int \frac{x^3 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\, dx = \begin{cases} \frac{x^3 \operatorname{asin}^2{(ax)}}{3a} - \frac{2x^3}{27a} - \frac{x^2\sqrt{-a^2x^2+1} \operatorname{asin}^3{(ax)}}{3a^2} + \frac{2x^2\sqrt{-a^2x^2+1} \operatorname{asin}{(ax)}}{9a^2} + \frac{2x \operatorname{asin}^2{(ax)}}{a^3} - \frac{40x}{9a^3} - \frac{2\sqrt{-a^2x^2+1} \operatorname{asin}^3{(ax)}}{3a^4} + \frac{40\sqrt{-}}{} \\ 0 \end{cases}$$

```
[In] integrate(x**3*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x**3*asin(a*x)**2/(3*a) - 2*x**3/(27*a) - x**2*sqrt(-a**2*x**2 +
 1)*asin(a*x)**3/(3*a**2) + 2*x**2*sqrt(-a**2*x**2 + 1)*asin(a*x)/(9*a**2)
+ 2*x*asin(a*x)**2/a**3 - 40*x/(9*a**3) - 2*sqrt(-a**2*x**2 + 1)*asin(a*x)*
*3/(3*a**4) + 40*sqrt(-a**2*x**2 + 1)*asin(a*x)/(9*a**4), Ne(a, 0)), (0, Tr
ue))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 131, normalized size of antiderivative = 0.83

$$\int \frac{x^3 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = -\frac{1}{3}\left(\frac{\sqrt{-a^2x^2+1}x^2}{a^2} + \frac{2\sqrt{-a^2x^2+1}}{a^4}\right)\arcsin(ax)^3 + \frac{2}{27}a\left(\frac{3\left(\sqrt{-a^2x^2+1}x^2 + \frac{20\sqrt{-a^2x^2+1}}{a^2}\right)\arcsin(ax)}{a^3} - \frac{a^2x^3+60x}{a^4}\right) + \frac{(a^2x^3+6x)\arcsin(ax)^2}{3a^3}$$

```
[In] integrate(x^3*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/3*(sqrt(-a^2*x^2 + 1)*x^2/a^2 + 2*sqrt(-a^2*x^2 + 1)/a^4)*arcsin(a*x)^3
+ 2/27*a*(3*(sqrt(-a^2*x^2 + 1)*x^2 + 20*sqrt(-a^2*x^2 + 1)/a^2)*arcsin(a*x
)/a^3 - (a^2*x^3 + 60*x)/a^4) + 1/3*(a^2*x^3 + 6*x)*arcsin(a*x)^2/a^3
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^3 \operatorname{asin}(a\,x)^3}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^3*asin(a*x)^3)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^3*asin(a*x)^3)/(1 - a^2*x^2)^(1/2), x)
```

3.305 $\int \frac{x^2 \arcsin(ax)^3}{\sqrt{1-a^2x^2}} dx$

Optimal result

Integrand size = 24, antiderivative size = 107

$$\int \frac{x^2 \arcsin(ax)^3}{\sqrt{1-a^2x^2}} dx = -\frac{3x^2}{8a} + \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)}{4a^2} - \frac{3\arcsin(ax)^2}{8a^3} + \frac{3x^2\arcsin(ax)^2}{4a} - \frac{x\sqrt{1-a^2x^2}\arcsin(ax)^3}{2a^2} + \frac{\arcsin(ax)^4}{8a^3}$$

```
[Out] -3/8*x^2/a-3/8*arcsin(a*x)^2/a^3+3/4*x^2*arcsin(a*x)^2/a+1/8*arcsin(a*x)^4/
a^3+3/4*x*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^2-1/2*x*arcsin(a*x)^3*(-a^2*x^2+
1)^(1/2)/a^2
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4795, 4737, 4723, 30}

$$\int \frac{x^2 \arcsin(ax)^3}{\sqrt{1-a^2x^2}} dx = \frac{\arcsin(ax)^4}{8a^3} - \frac{3\arcsin(ax)^2}{8a^3} - \frac{x\sqrt{1-a^2x^2}\arcsin(ax)^3}{2a^2} + \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)}{4a^2} + \frac{3x^2\arcsin(ax)^2}{4a} - \frac{3x^2}{8a}$$

```
[In] Int[(x^2*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-3*x^2)/(8*a) + (3*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/(4*a^2) - (3*ArcSin[a*
x]^2)/(8*a^3) + (3*x^2*ArcSin[a*x]^2)/(4*a) - (x*Sqrt[1 - a^2*x^2]*ArcSin[a
*x]^3)/(2*a^2) + ArcSin[a*x]^4/(8*a^3)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{x\sqrt{1-a^2x^2}\arcsin(ax)^3}{2a^2}+\frac{\int\frac{\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx}{2a^2}+\frac{3\int x\arcsin(ax)^2\,dx}{2a}\\
&= \frac{3x^2\arcsin(ax)^2}{4a}-\frac{x\sqrt{1-a^2x^2}\arcsin(ax)^3}{2a^2}+\frac{\arcsin(ax)^4}{8a^3}-\frac{3}{2}\int\frac{x^2\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx\\
&= \frac{3x\sqrt{1-a^2x^2}\arcsin(ax)}{4a^2}+\frac{3x^2\arcsin(ax)^2}{4a}-\frac{x\sqrt{1-a^2x^2}\arcsin(ax)^3}{2a^2}\\
&\quad+\frac{\arcsin(ax)^4}{8a^3}-\frac{3\int\frac{\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx}{4a^2}-\frac{3\int x\,dx}{4a}\\
&= -\frac{3x^2}{8a}+\frac{3x\sqrt{1-a^2x^2}\arcsin(ax)}{4a^2}-\frac{3\arcsin(ax)^2}{8a^3}\\
&\quad+\frac{3x^2\arcsin(ax)^2}{4a}-\frac{x\sqrt{1-a^2x^2}\arcsin(ax)^3}{2a^2}+\frac{\arcsin(ax)^4}{8a^3}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.79

$$\int \frac{x^2 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx$$
$$= \frac{-3a^2x^2+6ax\sqrt{1-a^2x^2}\arcsin(ax)+(-3+6a^2x^2)\arcsin(ax)^2-4ax\sqrt{1-a^2x^2}\arcsin(ax)^3+\arcsin(a}{8a^3}$$

```
[In] Integrate[(x^2*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-3*a^2*x^2 + 6*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x] + (-3 + 6*a^2*x^2)*ArcSin
[a*x]^2 - 4*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3 + ArcSin[a*x]^4)/(8*a^3)
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.79

method	result	size
default	$\frac{-4\arcsin(ax)^3\sqrt{-a^2x^2+1}\,ax+6\arcsin(ax)^2a^2x^2+\arcsin(ax)^4+6\arcsin(ax)\sqrt{-a^2x^2+1}\,ax-3a^2x^2-3\arcsin(ax)^2}{8a^3}$	85

```
[In] int(x^2*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/8*(-4*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)*a*x+6*arcsin(a*x)^2*a^2*x^2+arcsin
(a*x)^4+6*arcsin(a*x)*(-a^2*x^2+1)^(1/2)*a*x-3*a^2*x^2-3*arcsin(a*x)^2)/a^3
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.68

$$\int \frac{x^2 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx =$$
$$-\frac{3\,a^2x^2-\arcsin\left(ax\right)^4-3\left(2\,a^2x^2-1\right)\arcsin\left(ax\right)^2+2\left(2\,ax\arcsin\left(ax\right)^3-3\,ax\arcsin\left(ax\right)\right)\sqrt{-a^2x^2+}}{8\,a^3}$$

```
[In] integrate(x^2*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/8*(3*a^2*x^2 - arcsin(a*x)^4 - 3*(2*a^2*x^2 - 1)*arcsin(a*x)^2 + 2*(2*a*
x*arcsin(a*x)^3 - 3*a*x*arcsin(a*x))*sqrt(-a^2*x^2 + 1))/a^3
```

Sympy [A] (verification not implemented)

Time = 0.40 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.93

$$\int \frac{x^2 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{3x^2 \operatorname{asin}^2(ax)}{4a} - \frac{3x^2}{8a} - \frac{x\sqrt{-a^2x^2+1}\operatorname{asin}^3(ax)}{2a^2} + \frac{3x\sqrt{-a^2x^2+1}\operatorname{asin}(ax)}{4a^2} + \frac{\operatorname{asin}^4(ax)}{8a^3} - \frac{3\operatorname{asin}^2(ax)}{8a^3} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

```
[In] integrate(x**2*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((3*x**2*asin(a*x)**2/(4*a) - 3*x**2/(8*a) - x*sqrt(-a**2*x**2 + 1
)*asin(a*x)**3/(2*a**2) + 3*x*sqrt(-a**2*x**2 + 1)*asin(a*x)/(4*a**2) + asi
n(a*x)**4/(8*a**3) - 3*asin(a*x)**2/(8*a**3), Ne(a, 0)), (0, True))
```

Maxima [F]

$$\int \frac{x^2 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^2 \arcsin(ax)^3}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^2*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2*arcsin(a*x)^3/sqrt(-a^2*x^2 + 1), x)
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.01

$$\int \frac{x^2 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{-a^2x^2+1}x \arcsin(ax)^3}{2a^2} + \frac{\arcsin(ax)^4}{8a^3} + \frac{3\sqrt{-a^2x^2+1}x \arcsin(ax)}{4a^2} + \frac{3(a^2x^2-1)\arcsin(ax)^2}{4a^3} + \frac{3\arcsin(ax)^2}{8a^3} - \frac{3(a^2x^2-1)}{8a^3} - \frac{3}{16a^3}$$

```
[In] integrate(x^2*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)^3/a^2 + 1/8*arcsin(a*x)^4/a^3 + 3/4*s
qrt(-a^2*x^2 + 1)*x*arcsin(a*x)/a^2 + 3/4*(a^2*x^2 - 1)*arcsin(a*x)^2/a^3 +
 3/8*arcsin(a*x)^2/a^3 - 3/8*(a^2*x^2 - 1)/a^3 - 3/16/a^3
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2 \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^2\,\mathrm{asin}(a\,x)^3}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^2*asin(a*x)^3)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^2*asin(a*x)^3)/(1 - a^2*x^2)^(1/2), x)
```

3.306 $\int \frac{x \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 67

$$\int \frac{x \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = -\frac{6x}{a} + \frac{6\sqrt{1-a^2x^2}\arcsin(ax)}{a^2} + \frac{3x\arcsin(ax)^2}{a} - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{a^2}$$

```
[Out] -6*x/a+3*x*arcsin(a*x)^2/a+6*arcsin(a*x)*(-a^2*x^2+1)^(1/2)/a^2-arcsin(a*x)
^3*(-a^2*x^2+1)^(1/2)/a^2
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4767, 4715, 8}

$$\int \frac{x \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{a^2} + \frac{6\sqrt{1-a^2x^2}\arcsin(ax)}{a^2} + \frac{3x\arcsin(ax)^2}{a} - \frac{6x}{a}$$

```
[In] Int[(x*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-6*x)/a + (6*Sqrt[1 - a^2*x^2]*ArcSin[a*x])/a^2 + (3*x*ArcSin[a*x]^2)/a -
(Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/a^2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{a^2}+\frac{3\int\arcsin(ax)^2\,dx}{a}\\
&= \frac{3x\arcsin(ax)^2}{a}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{a^2}-6\int\frac{x\arcsin(ax)}{\sqrt{1-a^2x^2}}\,dx\\
&= \frac{6\sqrt{1-a^2x^2}\arcsin(ax)}{a^2}+\frac{3x\arcsin(ax)^2}{a}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{a^2}-\frac{6\int 1\,dx}{a}\\
&= -\frac{6x}{a}+\frac{6\sqrt{1-a^2x^2}\arcsin(ax)}{a^2}+\frac{3x\arcsin(ax)^2}{a}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{a^2}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.91

$$\int\frac{x\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{-6ax+6\sqrt{1-a^2x^2}\arcsin(ax)+3ax\arcsin(ax)^2-\sqrt{1-a^2x^2}\arcsin(ax)^3}{a^2}$$

```
[In] Integrate[(x*ArcSin[a*x]^3)/Sqrt[1 - a^2*x^2],x]
[Out] (-6*a*x + 6*Sqrt[1 - a^2*x^2]*ArcSin[a*x] + 3*a*x*ArcSin[a*x]^2 - Sqrt[1 -
a^2*x^2]*ArcSin[a*x]^3)/a^2
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.60

method	result	siz
default	$-\frac{\sqrt{-a^{2}x^{2}+1}\,\left(\arcsin(ax)^{3}a^{2}x^{2}-\arcsin(ax)^{3}+3\arcsin(ax)^{2}\sqrt{-a^{2}x^{2}+1}\,ax-6a^{2}x^{2}\arcsin(ax)+6\arcsin(ax)-6ax\sqrt{-a^{2}x^{2}+1}\right)}{a^{2}\left(a^{2}x^{2}-1\right)}$	10

```
[In] int(x*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/a^2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)*(arcsin(a*x)^3*a^2*x^2-arcsin(a*x)^3+
3*arcsin(a*x)^2*(-a^2*x^2+1)^(1/2)*a*x-6*a^2*x^2*arcsin(a*x)+6*arcsin(a*x)-
6*a*x*(-a^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.69

$$\int \frac{x\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{3\,ax\arcsin\left(ax\right)^2-6\,ax-\sqrt{-a^2x^2+1}\left(\arcsin\left(ax\right)^3-6\,\arcsin\left(ax\right)\right)}{a^2}$$

```
[In] integrate(x*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] (3*a*x*arcsin(a*x)^2 - 6*a*x - sqrt(-a^2*x^2 + 1)*(arcsin(a*x)^3 - 6*arcsin
(a*x)))/a^2
```

Sympy [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.91

$$\int \frac{x\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{3x\operatorname{asin}^{2}\left(ax\right)}{a}-\frac{6x}{a}-\frac{\sqrt{-a^{2}x^{2}+1}\operatorname{asin}^{3}\left(ax\right)}{a^{2}}+\frac{6\sqrt{-a^{2}x^{2}+1}\operatorname{asin}\left(ax\right)}{a^{2}} & \text{for}\ a\neq 0\\ 0 & \text{otherwise} \end{cases}$$

```
[In] integrate(x*asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((3*x*asin(a*x)**2/a - 6*x/a - sqrt(-a**2*x**2 + 1)*asin(a*x)**3/a
**2 + 6*sqrt(-a**2*x**2 + 1)*asin(a*x)/a**2, Ne(a, 0)), (0, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.96

$$\int \frac{x \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{3\,x \arcsin{(ax)}^2}{a} - \frac{\sqrt{-a^2x^2+1}\arcsin{(ax)}^3}{a^2} - \frac{6\left(x - \frac{\sqrt{-a^2x^2+1}\arcsin(ax)}{a}\right)}{a}$$

```
[In] integrate(x*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] 3*x*arcsin(a*x)^2/a - sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/a^2 - 6*(x - sqrt(-a
^2*x^2 + 1)*arcsin(a*x)/a)/a
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.93

$$\int \frac{x \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{-a^2x^2+1}\arcsin{(ax)}^3}{a^2} + \frac{3\left(x\arcsin{(ax)}^2 - 2\,x + \frac{2\sqrt{-a^2x^2+1}\arcsin(ax)}{a}\right)}{a}$$

```
[In] integrate(x*arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] -sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/a^2 + 3*(x*arcsin(a*x)^2 - 2*x + 2*sqrt(-
a^2*x^2 + 1)*arcsin(a*x)/a)/a
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x \arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x\,\mathrm{asin}(a\,x)^3}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x*asin(a*x)^3)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x*asin(a*x)^3)/(1 - a^2*x^2)^(1/2), x)
```

3.307 $\int \frac{\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 13

$$\int \frac{\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^4}{4a}$$

```
[Out] 1/4*arcsin(a*x)^4/a
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4737}

$$\int \frac{\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^4}{4a}$$

```
[In] Int[ArcSin[a*x]^3/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^4/(4*a)
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral} = \frac{\arcsin(ax)^4}{4a}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^4}{4a}$$

```
[In] Integrate[ArcSin[a*x]^3/Sqrt[1 - a^2*x^2],x]
[Out] ArcSin[a*x]^4/(4*a)
```

Maple [A] (verified)

Time = 0.10 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.92

method	result	size
derivativedivides	$\frac{\arcsin(ax)^4}{4a}$	12
default	$\frac{\arcsin(ax)^4}{4a}$	12

```
[In] int(arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/4*arcsin(a*x)^4/a
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^4}{4\,a}$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] 1/4*arcsin(a*x)^4/a
```

Sympy [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 10, normalized size of antiderivative = 0.77

$$\int \frac{\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{\operatorname{asin}^4(ax)}{4a} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

```
[In] integrate(asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
[Out] Piecewise((asin(a*x)**4/(4*a), Ne(a, 0)), (0, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^4}{4a}$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] 1/4*arcsin(a*x)^4/a
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^4}{4a}$$

```
[In] integrate(arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] 1/4*arcsin(a*x)^4/a
```

Mupad [B] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{\arcsin(ax)^3}{\sqrt{1-a^2x^2}}\,dx = \frac{\operatorname{asin}(a\,x)^4}{4\,a}$$

```
[In] int(asin(a*x)^3/(1 - a^2*x^2)^(1/2),x)
[Out] asin(a*x)^4/(4*a)
```

3.308 $\int \frac{\arcsin(ax)^3}{x\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 138

$$\begin{aligned}\int \frac{\arcsin(ax)^3}{x\sqrt{1-a^2x^2}}\,dx = & -2\arcsin(ax)^3\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right)\\ & + 3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right)\\ & - 3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right)\\ & - 6\arcsin(ax)\operatorname{PolyLog}\left(3,-e^{i\arcsin(ax)}\right)\\ & + 6\arcsin(ax)\operatorname{PolyLog}\left(3,e^{i\arcsin(ax)}\right)\\ & - 6i\operatorname{PolyLog}\left(4,-e^{i\arcsin(ax)}\right) + 6i\operatorname{PolyLog}\left(4,e^{i\arcsin(ax)}\right)\end{aligned}$$

```
[Out] -2*arcsin(a*x)^3*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))+3*I*arcsin(a*x)^2*polylo
g(2,-I*a*x-(-a^2*x^2+1)^(1/2))-3*I*arcsin(a*x)^2*polylog(2,I*a*x+(-a^2*x^2+
1)^(1/2))-6*arcsin(a*x)*polylog(3,-I*a*x-(-a^2*x^2+1)^(1/2))+6*arcsin(a*x)*
polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))-6*I*polylog(4,-I*a*x-(-a^2*x^2+1)^(1/2)
)+6*I*polylog(4,I*a*x+(-a^2*x^2+1)^(1/2))
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used

$= \{4803, 4268, 2611, 6744, 2320, 6724\}$

$$\int \frac{\arcsin(ax)^3}{x\sqrt{1-a^2x^2}}\,dx = -2\arcsin(ax)^3\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) + 3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) - 3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) - 6\arcsin(ax)\operatorname{PolyLog}\left(3,-e^{i\arcsin(ax)}\right) + 6\arcsin(ax)\operatorname{PolyLog}\left(3,e^{i\arcsin(ax)}\right) - 6i\operatorname{PolyLog}\left(4,-e^{i\arcsin(ax)}\right) + 6i\operatorname{PolyLog}\left(4,e^{i\arcsin(ax)}\right)$$

```
[In] Int[ArcSin[a*x]^3/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] -2*ArcSin[a*x]^3*ArcTanh[E^(I*ArcSin[a*x])] + (3*I)*ArcSin[a*x]^2*PolyLog[2
, -E^(I*ArcSin[a*x])] - (3*I)*ArcSin[a*x]^2*PolyLog[2, E^(I*ArcSin[a*x])] -
 6*ArcSin[a*x]*PolyLog[3, -E^(I*ArcSin[a*x])] + 6*ArcSin[a*x]*PolyLog[3, E^
(I*ArcSin[a*x])] - (6*I)*PolyLog[4, -E^(I*ArcSin[a*x])] + (6*I)*PolyLog[4,
E^(I*ArcSin[a*x])]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
```

```
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \text{Subst}\left(\int x^3\csc(x)\,dx, x, \arcsin(ax)\right)\\
&= -2\arcsin(ax)^3\text{arctanh}\left(e^{i\arcsin(ax)}\right) - 3\text{Subst}\left(\int x^2\log\left(1-e^{ix}\right)\,dx, x, \arcsin(ax)\right)\\
&\quad + 3\text{Subst}\left(\int x^2\log\left(1+e^{ix}\right)\,dx, x, \arcsin(ax)\right)\\
&= -2\arcsin(ax)^3\text{arctanh}\left(e^{i\arcsin(ax)}\right) + 3i\arcsin(ax)^2\,\text{PolyLog}\left(2,-e^{i\arcsin(ax)}\right)\\
&\quad - 3i\arcsin(ax)^2\,\text{PolyLog}\left(2,e^{i\arcsin(ax)}\right)\\
&\quad - 6i\text{Subst}\left(\int x\,\text{PolyLog}\left(2,-e^{ix}\right)\,dx, x, \arcsin(ax)\right)\\
&\quad + 6i\text{Subst}\left(\int x\,\text{PolyLog}\left(2,e^{ix}\right)\,dx, x, \arcsin(ax)\right)\\
&= -2\arcsin(ax)^3\text{arctanh}\left(e^{i\arcsin(ax)}\right) + 3i\arcsin(ax)^2\,\text{PolyLog}\left(2,-e^{i\arcsin(ax)}\right)\\
&\quad - 3i\arcsin(ax)^2\,\text{PolyLog}\left(2,e^{i\arcsin(ax)}\right)\\
&\quad - 6\arcsin(ax)\,\text{PolyLog}\left(3,-e^{i\arcsin(ax)}\right) + 6\arcsin(ax)\,\text{PolyLog}\left(3,e^{i\arcsin(ax)}\right)\\
&\quad + 6\text{Subst}\left(\int \text{PolyLog}\left(3,-e^{ix}\right)\,dx, x, \arcsin(ax)\right)\\
&\quad - 6\text{Subst}\left(\int \text{PolyLog}\left(3,e^{ix}\right)\,dx, x, \arcsin(ax)\right)
\end{aligned}
$$

$$
\begin{aligned}
&= -2\arcsin(ax)^3\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) + 3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) \\
&\quad - 3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) \\
&\quad - 6\arcsin(ax)\operatorname{PolyLog}\left(3,-e^{i\arcsin(ax)}\right) + 6\arcsin(ax)\operatorname{PolyLog}\left(3,e^{i\arcsin(ax)}\right) \\
&\quad - 6i\text{Subst}\left(\int\frac{\operatorname{PolyLog}(3,-x)}{x}\,dx,x,e^{i\arcsin(ax)}\right) \\
&\quad + 6i\text{Subst}\left(\int\frac{\operatorname{PolyLog}(3,x)}{x}\,dx,x,e^{i\arcsin(ax)}\right) \\
&= -2\arcsin(ax)^3\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) + 3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) \\
&\quad - 3i\arcsin(ax)^2\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) \\
&\quad - 6\arcsin(ax)\operatorname{PolyLog}\left(3,-e^{i\arcsin(ax)}\right) + 6\arcsin(ax)\operatorname{PolyLog}\left(3,e^{i\arcsin(ax)}\right) \\
&\quad - 6i\operatorname{PolyLog}\left(4,-e^{i\arcsin(ax)}\right) + 6i\operatorname{PolyLog}\left(4,e^{i\arcsin(ax)}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.30

$$
\begin{aligned}
\int\frac{\arcsin(ax)^3}{x\sqrt{1-a^2x^2}}\,dx = -\frac{1}{8}i\Big(&\pi^4 - 2\arcsin(ax)^4 + 8i\arcsin(ax)^3\log\left(1-e^{-i\arcsin(ax)}\right) \\
&- 8i\arcsin(ax)^3\log\left(1+e^{i\arcsin(ax)}\right) \\
&- 24\arcsin(ax)^2\operatorname{PolyLog}\left(2,e^{-i\arcsin(ax)}\right) \\
&- 24\arcsin(ax)^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) \\
&+ 48i\arcsin(ax)\operatorname{PolyLog}\left(3,e^{-i\arcsin(ax)}\right) \\
&- 48i\arcsin(ax)\operatorname{PolyLog}\left(3,-e^{i\arcsin(ax)}\right) \\
&+ 48\operatorname{PolyLog}\left(4,e^{-i\arcsin(ax)}\right) + 48\operatorname{PolyLog}\left(4,-e^{i\arcsin(ax)}\right)\Big)
\end{aligned}
$$

```
[In] Integrate[ArcSin[a*x]^3/(x*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (-1/8*I)*(Pi^4 - 2*ArcSin[a*x]^4 + (8*I)*ArcSin[a*x]^3*Log[1 - E^((-I)*ArcS
in[a*x])] - (8*I)*ArcSin[a*x]^3*Log[1 + E^(I*ArcSin[a*x])] - 24*ArcSin[a*x]
^2*PolyLog[2, E^((-I)*ArcSin[a*x])] - 24*ArcSin[a*x]^2*PolyLog[2, -E^(I*Arc
Sin[a*x])] + (48*I)*ArcSin[a*x]*PolyLog[3, E^((-I)*ArcSin[a*x])] - (48*I)*A
rcSin[a*x]*PolyLog[3, -E^(I*ArcSin[a*x])] + 48*PolyLog[4, E^((-I)*ArcSin[a*
x])] + 48*PolyLog[4, -E^(I*ArcSin[a*x])])
```

Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 225, normalized size of antiderivative = 1.63

method	result
default	$i\left(i \arcsin \left(a x\right)^{3} \ln \left(1+i a x+\sqrt{-a^{2} x^{2}+1}\right)+3 \arcsin \left(a x\right)^{2} \operatorname{polylog}\left(2,-i a x-\sqrt{-a^{2} x^{2}+1}\right)+6$

```
[In] int(arcsin(a*x)^3/x/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] I*(I*arcsin(a*x)^3*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))+3*arcsin(a*x)^2*polylog(2
,-I*a*x-(-a^2*x^2+1)^(1/2))+6*I*arcsin(a*x)*polylog(3,-I*a*x-(-a^2*x^2+1)^(
1/2))-6*polylog(4,-I*a*x-(-a^2*x^2+1)^(1/2))-I*arcsin(a*x)^3*ln(1-I*a*x-(-a
^2*x^2+1)^(1/2))-3*arcsin(a*x)^2*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))-6*I*ar
csin(a*x)*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))+6*polylog(4,I*a*x+(-a^2*x^2+1
)^(1/2)))
```

Fricas [F]

$$\int \frac{\arcsin(ax)^3}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin\left(ax\right)^3}{\sqrt{-a^2x^2+1}x}\,dx$$

```
[In] integrate(arcsin(a*x)^3/x/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/(a^2*x^3 - x), x)
```

Sympy [F]

$$\int \frac{\arcsin(ax)^3}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\operatorname{asin}^3\left(ax\right)}{x\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

```
[In] integrate(asin(a*x)**3/x/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(asin(a*x)**3/(x*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Maxima [F]

$$\int \frac{\arcsin(ax)^3}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin{(ax)}^3}{\sqrt{-a^2x^2+1}x}\,dx$$

```
[In] integrate(arcsin(a*x)^3/x/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x), x)
```

Giac [F]

$$\int \frac{\arcsin(ax)^3}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin{(ax)}^3}{\sqrt{-a^2x^2+1}x}\,dx$$

```
[In] integrate(arcsin(a*x)^3/x/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^3}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^3}{x\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(asin(a*x)^3/(x*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^3/(x*(1 - a^2*x^2)^(1/2)), x)
```

3.309 $\int \frac{\arcsin(ax)^3}{x^2\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 99

$$\int \frac{\arcsin(ax)^3}{x^2\sqrt{1-a^2x^2}}\,dx = -ia\arcsin(ax)^3 - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{x} + 3a\arcsin(ax)^2\log\left(1-e^{2i\arcsin(ax)}\right) - 3ia\arcsin(ax)\operatorname{PolyLog}\left(2,e^{2i\arcsin(ax)}\right) + \frac{3}{2}a\operatorname{PolyLog}\left(3,e^{2i\arcsin(ax)}\right)$$

```
[Out] -I*a*arcsin(a*x)^3+3*a*arcsin(a*x)^2*ln(1-(I*a*x+(-a^2*x^2+1)^(1/2))^2)-3*I
*a*arcsin(a*x)*polylog(2,(I*a*x+(-a^2*x^2+1)^(1/2))^2)+3/2*a*polylog(3,(I*a
*x+(-a^2*x^2+1)^(1/2))^2)-arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)/x
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.292$, Rules used = {4771, 4721, 3798, 2221, 2611, 2320, 6724}

$$\int \frac{\arcsin(ax)^3}{x^2\sqrt{1-a^2x^2}}\,dx = -\frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{x} - 3ia\arcsin(ax)\operatorname{PolyLog}\left(2,e^{2i\arcsin(ax)}\right) + \frac{3}{2}a\operatorname{PolyLog}\left(3,e^{2i\arcsin(ax)}\right) - ia\arcsin(ax)^3 + 3a\arcsin(ax)^2\log\left(1-e^{2i\arcsin(ax)}\right)$$

```
[In] Int[ArcSin[a*x]^3/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (-I)*a*ArcSin[a*x]^3 - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/x + 3*a*ArcSin[a*x
]^2*Log[1 - E^((2*I)*ArcSin[a*x])] - (3*I)*a*ArcSin[a*x]*PolyLog[2, E^((2*I
)*ArcSin[a*x])] + (3*a*PolyLog[3, E^((2*I)*ArcSin[a*x])])/2
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{x} + (3a)\int \frac{\arcsin(ax)^2}{x}\,dx \\
&= -\frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{x} + (3a)\text{Subst}\left(\int x^2\cot(x)\,dx, x, \arcsin(ax)\right) \\
&= -ia\arcsin(ax)^3 - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{x} - (6ia)\text{Subst}\left(\int \frac{e^{2ix}x^2}{1-e^{2ix}}\,dx, x, \arcsin(ax)\right) \\
&= -ia\arcsin(ax)^3 - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{x} + 3a\arcsin(ax)^2\log\left(1-e^{2i\arcsin(ax)}\right) \\
&\quad - (6a)\text{Subst}\left(\int x\log\left(1-e^{2ix}\right)\,dx, x, \arcsin(ax)\right) \\
&= -ia\arcsin(ax)^3 - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{x} \\
&\quad + 3a\arcsin(ax)^2\log\left(1-e^{2i\arcsin(ax)}\right) - 3ia\arcsin(ax)\,\text{PolyLog}\left(2, e^{2i\arcsin(ax)}\right) \\
&\quad + (3ia)\text{Subst}\left(\int \text{PolyLog}\left(2, e^{2ix}\right)\,dx, x, \arcsin(ax)\right) \\
&= -ia\arcsin(ax)^3 - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{x} \\
&\quad + 3a\arcsin(ax)^2\log\left(1-e^{2i\arcsin(ax)}\right) - 3ia\arcsin(ax)\,\text{PolyLog}\left(2, e^{2i\arcsin(ax)}\right) \\
&\quad + \frac{1}{2}(3a)\text{Subst}\left(\int \frac{\text{PolyLog}(2,x)}{x}\,dx, x, e^{2i\arcsin(ax)}\right) \\
&= -ia\arcsin(ax)^3 - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{x} + 3a\arcsin(ax)^2\log\left(1-e^{2i\arcsin(ax)}\right) \\
&\quad - 3ia\arcsin(ax)\,\text{PolyLog}\left(2, e^{2i\arcsin(ax)}\right) + \frac{3}{2}a\,\text{PolyLog}\left(3, e^{2i\arcsin(ax)}\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.09

$$\int \frac{\arcsin(ax)^3}{x^2\sqrt{1-a^2x^2}}\,dx = \frac{1}{8}a\left(-i\pi^3+8i\arcsin(ax)^3-\frac{8\sqrt{1-a^2x^2}\arcsin(ax)^3}{ax}+24\arcsin(ax)^2\log\left(1-e^{-2i\arcsin(ax)}\right)+24i\arcsin(ax)\operatorname{PolyLog}\left(2,e^{-2i\arcsin(ax)}\right)+12\operatorname{PolyLog}\left(3,e^{-2i\arcsin(ax)}\right)\right)$$

```
[In] Integrate[ArcSin[a*x]^3/(x^2*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (a*((-I)*Pi^3 + (8*I)*ArcSin[a*x]^3 - (8*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(
a*x) + 24*ArcSin[a*x]^2*Log[1 - E^((-2*I)*ArcSin[a*x])] + (24*I)*ArcSin[a*x
]*PolyLog[2, E^((-2*I)*ArcSin[a*x])] + 12*PolyLog[3, E^((-2*I)*ArcSin[a*x])
]))/8
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 205, normalized size of antiderivative = 2.07

method	result
default	$\frac{\left(iax-\sqrt{-a^2x^2+1}\right)\arcsin(ax)^3}{x} - a\left(2i\arcsin\left(ax\right)^3 - 3\arcsin\left(ax\right)^2\ln\left(1+iax+\sqrt{-a^2x^2+1}\right) - 3\arcsin$

```
[In] int(arcsin(a*x)^3/x^2/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] (I*a*x-(-a^2*x^2+1)^(1/2))*arcsin(a*x)^3/x-a*(2*I*arcsin(a*x)^3-3*arcsin(a*
x)^2*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))-3*arcsin(a*x)^2*ln(1-I*a*x-(-a^2*x^2+1)
^(1/2))+6*I*arcsin(a*x)*polylog(2,-I*a*x-(-a^2*x^2+1)^(1/2))+6*I*arcsin(a*x
)*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))-6*polylog(3,-I*a*x-(-a^2*x^2+1)^(1/2)
)-6*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{\arcsin(ax)^3}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin\left(ax\right)^3}{\sqrt{-a^2x^2+1}x^2}\,dx$$

[In] integrate(arcsin(a*x)^3/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/(a^2*x^4 - x^2), x)

Sympy [F]

$$\int \frac{\arcsin(ax)^3}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\operatorname{asin}^3\left(ax\right)}{x^2\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

[In] integrate(asin(a*x)**3/x**2/(-a**2*x**2+1)**(1/2),x)

[Out] Integral(asin(a*x)**3/(x**2*sqrt(-(a*x - 1)*(a*x + 1))), x)

Maxima [F]

$$\int \frac{\arcsin(ax)^3}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin\left(ax\right)^3}{\sqrt{-a^2x^2+1}x^2}\,dx$$

[In] integrate(arcsin(a*x)^3/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] (3*a^3*x*integrate(x*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))^2, x) - sqrt(a*x + 1)*sqrt(-a*x + 1)*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))^3)/x

Giac [F]

$$\int \frac{\arcsin(ax)^3}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin\left(ax\right)^3}{\sqrt{-a^2x^2+1}x^2}\,dx$$

[In] integrate(arcsin(a*x)^3/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")

[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x^2), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^3}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^3}{x^2\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(asin(a*x)^3/(x^2*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^3/(x^2*(1 - a^2*x^2)^(1/2)), x)
```

3.310 $\int \frac{\arcsin(ax)^3}{x^3\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 264

$$
\begin{aligned}
\int \frac{\arcsin(ax)^3}{x^3\sqrt{1-a^2x^2}}\,dx = & -\frac{3a\arcsin(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{2x^2} \\
& - 6a^2\arcsin(ax)\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) \\
& - a^2\arcsin(ax)^3\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) + 3ia^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) \\
& + \frac{3}{2}ia^2\arcsin(ax)^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) \\
& - 3ia^2\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) \\
& - \frac{3}{2}ia^2\arcsin(ax)^2\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) \\
& - 3a^2\arcsin(ax)\operatorname{PolyLog}\left(3,-e^{i\arcsin(ax)}\right) \\
& + 3a^2\arcsin(ax)\operatorname{PolyLog}\left(3,e^{i\arcsin(ax)}\right) \\
& - 3ia^2\operatorname{PolyLog}\left(4,-e^{i\arcsin(ax)}\right) + 3ia^2\operatorname{PolyLog}\left(4,e^{i\arcsin(ax)}\right)
\end{aligned}
$$

```
[Out] -3/2*a*arcsin(a*x)^2/x-6*a^2*arcsin(a*x)*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))-
a^2*arcsin(a*x)^3*arctanh(I*a*x+(-a^2*x^2+1)^(1/2))+3*I*a^2*polylog(2,-I*a*
x-(-a^2*x^2+1)^(1/2))+3/2*I*a^2*arcsin(a*x)^2*polylog(2,-I*a*x-(-a^2*x^2+1)
^(1/2))-3*I*a^2*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))-3/2*I*a^2*arcsin(a*x)^2
*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))-3*a^2*arcsin(a*x)*polylog(3,-I*a*x-(-a
^2*x^2+1)^(1/2))+3*a^2*arcsin(a*x)*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))-3*I*
a^2*polylog(4,-I*a*x-(-a^2*x^2+1)^(1/2))+3*I*a^2*polylog(4,I*a*x+(-a^2*x^2+
1)^(1/2))-1/2*arcsin(a*x)^3*(-a^2*x^2+1)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 264, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4789, 4803, 4268, 2611, 6744, 2320, 6724, 4723, 2317, 2438}

$$\int \frac{\arcsin(ax)^3}{x^3\sqrt{1-a^2x^2}}\,dx = -a^2\arcsin(ax)^3\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) - 6a^2\arcsin(ax)\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) + \frac{3}{2}ia^2\arcsin(ax)^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) - \frac{3}{2}ia^2\arcsin(ax)^2\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) - 3a^2\arcsin(ax)\operatorname{PolyLog}\left(3,-e^{i\arcsin(ax)}\right) + 3a^2\arcsin(ax)\operatorname{PolyLog}\left(3,e^{i\arcsin(ax)}\right) + 3ia^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) - 3ia^2\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) - 3ia^2\operatorname{PolyLog}\left(4,-e^{i\arcsin(ax)}\right) + 3ia^2\operatorname{PolyLog}\left(4,e^{i\arcsin(ax)}\right) - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{2x^2} - \frac{3a\arcsin(ax)^2}{2x}$$

```
[In] Int[ArcSin[a*x]^3/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (-3*a*ArcSin[a*x]^2)/(2*x) - (Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3)/(2*x^2) - 6*
a^2*ArcSin[a*x]*ArcTanh[E^(I*ArcSin[a*x])] - a^2*ArcSin[a*x]^3*ArcTanh[E^(I
*ArcSin[a*x])] + (3*I)*a^2*PolyLog[2, -E^(I*ArcSin[a*x])] + ((3*I)/2)*a^2*A
rcSin[a*x]^2*PolyLog[2, -E^(I*ArcSin[a*x])] - (3*I)*a^2*PolyLog[2, E^(I*Arc
Sin[a*x])] - ((3*I)/2)*a^2*ArcSin[a*x]^2*PolyLog[2, E^(I*ArcSin[a*x])] - 3*
a^2*ArcSin[a*x]*PolyLog[3, -E^(I*ArcSin[a*x])] + 3*a^2*ArcSin[a*x]*PolyLog[
3, E^(I*ArcSin[a*x])] - (3*I)*a^2*PolyLog[4, -E^(I*ArcSin[a*x])] + (3*I)*a^
2*PolyLog[4, E^(I*ArcSin[a*x])]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{2x^2}+\frac{1}{2}(3a)\int\frac{\arcsin(ax)^2}{x^2}\,dx+\frac{1}{2}a^2\int\frac{\arcsin(ax)^3}{x\sqrt{1-a^2x^2}}\,dx\\
&= -\frac{3a\arcsin(ax)^2}{2x}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{2x^2}\\
&\quad+\frac{1}{2}a^2\text{Subst}\left(\int x^3\csc(x)\,dx,x,\arcsin(ax)\right)+\left(3a^2\right)\int\frac{\arcsin(ax)}{x\sqrt{1-a^2x^2}}\,dx\\
&= -\frac{3a\arcsin(ax)^2}{2x}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{2x^2}-a^2\arcsin(ax)^3\text{arctanh}\left(e^{i\arcsin(ax)}\right)\\
&\quad-\frac{1}{2}\left(3a^2\right)\text{Subst}\left(\int x^2\log\left(1-e^{ix}\right)\,dx,x,\arcsin(ax)\right)\\
&\quad+\frac{1}{2}\left(3a^2\right)\text{Subst}\left(\int x^2\log\left(1+e^{ix}\right)\,dx,x,\arcsin(ax)\right)\\
&\quad+\left(3a^2\right)\text{Subst}(\int x\csc(x)\,dx,x,\arcsin(ax))\\
&= -\frac{3a\arcsin(ax)^2}{2x}-\frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{2x^2}-6a^2\arcsin(ax)\text{arctanh}\left(e^{i\arcsin(ax)}\right)\\
&\quad-a^2\arcsin(ax)^3\text{arctanh}\left(e^{i\arcsin(ax)}\right)+\frac{3}{2}ia^2\arcsin(ax)^2\,\text{PolyLog}\left(2,-e^{i\arcsin(ax)}\right)\\
&\quad-\frac{3}{2}ia^2\arcsin(ax)^2\,\text{PolyLog}\left(2,e^{i\arcsin(ax)}\right)\\
&\quad-\left(3ia^2\right)\text{Subst}\left(\int x\,\text{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(ax)\right)\\
&\quad+\left(3ia^2\right)\text{Subst}\left(\int x\,\text{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(ax)\right)\\
&\quad-\left(3a^2\right)\text{Subst}\left(\int\log\left(1-e^{ix}\right)\,dx,x,\arcsin(ax)\right)\\
&\quad+\left(3a^2\right)\text{Subst}\left(\int\log\left(1+e^{ix}\right)\,dx,x,\arcsin(ax)\right)
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{3a\arcsin(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{2x^2} - 6a^2\arcsin(ax)\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) \\
&\quad - a^2\arcsin(ax)^3\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) + \frac{3}{2}ia^2\arcsin(ax)^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) \\
&\quad - \frac{3}{2}ia^2\arcsin(ax)^2\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) \\
&\quad - 3a^2\arcsin(ax)\operatorname{PolyLog}\left(3,-e^{i\arcsin(ax)}\right) + 3a^2\arcsin(ax)\operatorname{PolyLog}\left(3,e^{i\arcsin(ax)}\right) \\
&\quad + \left(3ia^2\right)\operatorname{Subst}\left(\int\frac{\log(1-x)}{x}\,dx, x, e^{i\arcsin(ax)}\right) \\
&\quad - \left(3ia^2\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx, x, e^{i\arcsin(ax)}\right) \\
&\quad + \left(3a^2\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(3,-e^{ix}\right)\,dx, x, \arcsin(ax)\right) \\
&\quad - \left(3a^2\right)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(3,e^{ix}\right)\,dx, x, \arcsin(ax)\right)
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{3a\arcsin(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{2x^2} - 6a^2\arcsin(ax)\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) \\
&\quad - a^2\arcsin(ax)^3\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) + 3ia^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) \\
&\quad + \frac{3}{2}ia^2\arcsin(ax)^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) \\
&\quad - 3ia^2\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) - \frac{3}{2}ia^2\arcsin(ax)^2\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) \\
&\quad - 3a^2\arcsin(ax)\operatorname{PolyLog}\left(3,-e^{i\arcsin(ax)}\right) + 3a^2\arcsin(ax)\operatorname{PolyLog}\left(3,e^{i\arcsin(ax)}\right) \\
&\quad - \left(3ia^2\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(3,-x)}{x}\,dx, x, e^{i\arcsin(ax)}\right) \\
&\quad + \left(3ia^2\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(3,x)}{x}\,dx, x, e^{i\arcsin(ax)}\right)
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{3a\arcsin(ax)^2}{2x} - \frac{\sqrt{1-a^2x^2}\arcsin(ax)^3}{2x^2} - 6a^2\arcsin(ax)\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) \\
&\quad - a^2\arcsin(ax)^3\operatorname{arctanh}\left(e^{i\arcsin(ax)}\right) + 3ia^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) \\
&\quad + \frac{3}{2}ia^2\arcsin(ax)^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right) \\
&\quad - 3ia^2\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) - \frac{3}{2}ia^2\arcsin(ax)^2\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right) \\
&\quad - 3a^2\arcsin(ax)\operatorname{PolyLog}\left(3,-e^{i\arcsin(ax)}\right) + 3a^2\arcsin(ax)\operatorname{PolyLog}\left(3,e^{i\arcsin(ax)}\right) \\
&\quad - 3ia^2\operatorname{PolyLog}\left(4,-e^{i\arcsin(ax)}\right) + 3ia^2\operatorname{PolyLog}\left(4,e^{i\arcsin(ax)}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 3.44 (sec) , antiderivative size = 317, normalized size of antiderivative = 1.20

$$\int \frac{\arcsin(ax)^3}{x^3\sqrt{1-a^2x^2}}\,dx = \frac{1}{16}a^2\left(-i\pi^4+2i\arcsin(ax)^4-12\arcsin(ax)^2\cot\left(\frac{1}{2}\arcsin(ax)\right)\right.$$
$$-2\arcsin(ax)^3\csc^2\left(\frac{1}{2}\arcsin(ax)\right)$$
$$+8\arcsin(ax)^3\log\left(1-e^{-i\arcsin(ax)}\right)+48\arcsin(ax)\log\left(1-e^{i\arcsin(ax)}\right)$$
$$-48\arcsin(ax)\log\left(1+e^{i\arcsin(ax)}\right)-8\arcsin(ax)^3\log\left(1+e^{i\arcsin(ax)}\right)$$
$$+24i\arcsin(ax)^2\operatorname{PolyLog}\left(2,e^{-i\arcsin(ax)}\right)$$
$$+24i\left(2+\arcsin(ax)^2\right)\operatorname{PolyLog}\left(2,-e^{i\arcsin(ax)}\right)$$
$$-48i\operatorname{PolyLog}\left(2,e^{i\arcsin(ax)}\right)+48\arcsin(ax)\operatorname{PolyLog}\left(3,e^{-i\arcsin(ax)}\right)$$
$$-48\arcsin(ax)\operatorname{PolyLog}\left(3,-e^{i\arcsin(ax)}\right)$$
$$-48i\operatorname{PolyLog}\left(4,e^{-i\arcsin(ax)}\right)-48i\operatorname{PolyLog}\left(4,-e^{i\arcsin(ax)}\right)$$
$$+2\arcsin(ax)^3\sec^2\left(\frac{1}{2}\arcsin(ax)\right)$$
$$\left.-12\arcsin(ax)^2\tan\left(\frac{1}{2}\arcsin(ax)\right)\right)$$

```
[In] Integrate[ArcSin[a*x]^3/(x^3*Sqrt[1 - a^2*x^2]),x]
```

```
[Out] (a^2*((-I)*Pi^4 + (2*I)*ArcSin[a*x]^4 - 12*ArcSin[a*x]^2*Cot[ArcSin[a*x]/2]
 - 2*ArcSin[a*x]^3*Csc[ArcSin[a*x]/2]^2 + 8*ArcSin[a*x]^3*Log[1 - E^((-I)*A
rcSin[a*x])] + 48*ArcSin[a*x]*Log[1 - E^(I*ArcSin[a*x])] - 48*ArcSin[a*x]*L
og[1 + E^(I*ArcSin[a*x])] - 8*ArcSin[a*x]^3*Log[1 + E^(I*ArcSin[a*x])] + (2
4*I)*ArcSin[a*x]^2*PolyLog[2, E^((-I)*ArcSin[a*x])] + (24*I)*(2 + ArcSin[a*
x]^2)*PolyLog[2, -E^(I*ArcSin[a*x])] - (48*I)*PolyLog[2, E^(I*ArcSin[a*x])]
 + 48*ArcSin[a*x]*PolyLog[3, E^((-I)*ArcSin[a*x])] - 48*ArcSin[a*x]*PolyLog
[3, -E^(I*ArcSin[a*x])] - (48*I)*PolyLog[4, E^((-I)*ArcSin[a*x])] - (48*I)*
PolyLog[4, -E^(I*ArcSin[a*x])] + 2*ArcSin[a*x]^3*Sec[ArcSin[a*x]/2]^2 - 12*
ArcSin[a*x]^2*Tan[ArcSin[a*x]/2]))/16
```

Maple [A] (verified)

Time = 0.15 (sec) , antiderivative size = 399, normalized size of antiderivative = 1.51

method	result
default	$-\frac{\sqrt{-a^2x^2+1}\,\arcsin(ax)^2\left(a^2x^2\arcsin(ax)-3ax\sqrt{-a^2x^2+1}-\arcsin(ax)\right)}{2(a^2x^2-1)x^2}+\frac{ia^2\left(i\arcsin(ax)^3\ln\left(1+iax+\sqrt{-a^2x^2+1}\right)-i\arcsin(ax\right.}{}$

```
[In] int(arcsin(a*x)^3/x^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*(-a^2*x^2+1)^(1/2)/(a^2*x^2-1)/x^2*arcsin(a*x)^2*(a^2*x^2*arcsin(a*x)-
3*a*x*(-a^2*x^2+1)^(1/2)-arcsin(a*x))+1/2*I*a^2*(I*arcsin(a*x)^3*ln(1+I*a*x
+(-a^2*x^2+1)^(1/2))-I*arcsin(a*x)^3*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))+6*I*arc
sin(a*x)*ln(1+I*a*x+(-a^2*x^2+1)^(1/2))+6*I*arcsin(a*x)*polylog(3,-I*a*x-(-
a^2*x^2+1)^(1/2))-6*I*arcsin(a*x)*ln(1-I*a*x-(-a^2*x^2+1)^(1/2))-6*I*arcsin
(a*x)*polylog(3,I*a*x+(-a^2*x^2+1)^(1/2))+3*arcsin(a*x)^2*polylog(2,-I*a*x-
(-a^2*x^2+1)^(1/2))-3*arcsin(a*x)^2*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))+6*p
olylog(2,-I*a*x-(-a^2*x^2+1)^(1/2))-6*polylog(4,-I*a*x-(-a^2*x^2+1)^(1/2))-
6*polylog(2,I*a*x+(-a^2*x^2+1)^(1/2))+6*polylog(4,I*a*x+(-a^2*x^2+1)^(1/2))
)
```

Fricas [F]

$$\int \frac{\arcsin(ax)^3}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin\left(ax\right)^3}{\sqrt{-a^2x^2+1}x^3}\,dx$$

```
[In] integrate(arcsin(a*x)^3/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^3/(a^2*x^5 - x^3), x)
```

Sympy [F]

$$\int \frac{\arcsin(ax)^3}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\operatorname{asin}^3\left(ax\right)}{x^3\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

```
[In] integrate(asin(a*x)**3/x**3/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(asin(a*x)**3/(x**3*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Maxima [F]

$$\int \frac{\arcsin(ax)^3}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin\left(ax\right)^3}{\sqrt{-a^2x^2+1}x^3}\,dx$$

```
[In] integrate(arcsin(a*x)^3/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

Giac [F]

$$\int \frac{\arcsin(ax)^3}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin\left(ax\right)^3}{\sqrt{-a^2x^2+1}x^3}\,dx$$

```
[In] integrate(arcsin(a*x)^3/x^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^3/(sqrt(-a^2*x^2 + 1)*x^3), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^3}{x^3\sqrt{1-a^2x^2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^3}{x^3\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(asin(a*x)^3/(x^3*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^3/(x^3*(1 - a^2*x^2)^(1/2)), x)
```

3.311 $\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 67

$$\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)}\,dx = \frac{35c^3\,\text{CosIntegral}(\arcsin(ax))}{64a} + \frac{21c^3\,\text{CosIntegral}(3\arcsin(ax))}{64a} + \frac{7c^3\,\text{CosIntegral}(5\arcsin(ax))}{64a} + \frac{c^3\,\text{CosIntegral}(7\arcsin(ax))}{64a}$$

```
[Out] 35/64*c^3*Ci(arcsin(a*x))/a+21/64*c^3*Ci(3*arcsin(a*x))/a+7/64*c^3*Ci(5*arc
sin(a*x))/a+1/64*c^3*Ci(7*arcsin(a*x))/a
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {4753, 3393, 3383}

$$\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)}\,dx = \frac{35c^3\,\text{CosIntegral}(\arcsin(ax))}{64a} + \frac{21c^3\,\text{CosIntegral}(3\arcsin(ax))}{64a} + \frac{7c^3\,\text{CosIntegral}(5\arcsin(ax))}{64a} + \frac{c^3\,\text{CosIntegral}(7\arcsin(ax))}{64a}$$

```
[In] Int[(c - a^2*c*x^2)^3/ArcSin[a*x],x]
```

```
[Out] (35*c^3*CosIntegral[ArcSin[a*x]])/(64*a) + (21*c^3*CosIntegral[3*ArcSin[a*x
]])/(64*a) + (7*c^3*CosIntegral[5*ArcSin[a*x]])/(64*a) + (c^3*CosIntegral[7
*ArcSin[a*x]])/(64*a)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{c^3\text{Subst}\left(\int \frac{\cos^7(x)}{x}\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{c^3\text{Subst}\left(\int \left(\frac{35\cos(x)}{64x}+\frac{21\cos(3x)}{64x}+\frac{7\cos(5x)}{64x}+\frac{\cos(7x)}{64x}\right)\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{c^3\text{Subst}\left(\int \frac{\cos(7x)}{x}\,dx, x, \arcsin(ax)\right)}{64a}+\frac{(7c^3)\,\text{Subst}\left(\int \frac{\cos(5x)}{x}\,dx, x, \arcsin(ax)\right)}{64a}\\
&\quad+\frac{(21c^3)\,\text{Subst}\left(\int \frac{\cos(3x)}{x}\,dx, x, \arcsin(ax)\right)}{64a}+\frac{(35c^3)\,\text{Subst}\left(\int \frac{\cos(x)}{x}\,dx, x, \arcsin(ax)\right)}{64a}\\
&= \frac{35c^3\,\text{CosIntegral}(\arcsin(ax))}{64a}+\frac{21c^3\,\text{CosIntegral}(3\arcsin(ax))}{64a}\\
&\quad+\frac{7c^3\,\text{CosIntegral}(5\arcsin(ax))}{64a}+\frac{c^3\,\text{CosIntegral}(7\arcsin(ax))}{64a}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.64

$$\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)}\,dx$$
$$= \frac{c^3(35\,\text{CosIntegral}(\arcsin(ax))+21\,\text{CosIntegral}(3\arcsin(ax))+7\,\text{CosIntegral}(5\arcsin(ax))+\text{CosIntegral}(}{64a}$$

```
[In] Integrate[(c - a^2*c*x^2)^3/ArcSin[a*x],x]
[Out] (c^3*(35*CosIntegral[ArcSin[a*x]] + 21*CosIntegral[3*ArcSin[a*x]] + 7*CosIn
tegral[5*ArcSin[a*x]] + CosIntegral[7*ArcSin[a*x]]))/(64*a)
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.63

method	result	size
derivativedivides	$\frac{c^3(35\ \mathrm{Ci}(\arcsin(ax))+21\ \mathrm{Ci}(3\arcsin(ax))+7\ \mathrm{Ci}(5\arcsin(ax))+\mathrm{Ci}(7\arcsin(ax)))}{64a}$	42
default	$\frac{c^3(35\ \mathrm{Ci}(\arcsin(ax))+21\ \mathrm{Ci}(3\arcsin(ax))+7\ \mathrm{Ci}(5\arcsin(ax))+\mathrm{Ci}(7\arcsin(ax)))}{64a}$	42

```
[In] int((-a^2*c*x^2+c)^3/arcsin(a*x),x,method=_RETURNVERBOSE)
[Out] 1/64/a*c^3*(35*Ci(arcsin(a*x))+21*Ci(3*arcsin(a*x))+7*Ci(5*arcsin(a*x))+Ci(
7*arcsin(a*x)))
```

Fricas [F]

$$\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)}\,dx = \int -\frac{(a^2cx^2-c)^3}{\arcsin(ax)}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x),x, algorithm="fricas")
[Out] integral(-(a^6*c^3*x^6 - 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 - c^3)/arcsin(a*x),
x)
```

Sympy [F]

$$\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)}\,dx = -c^3\left(\int \frac{3a^2x^2}{\operatorname{asin}(ax)}\,dx + \int \left(-\frac{3a^4x^4}{\operatorname{asin}(ax)}\right)dx + \int \frac{a^6x^6}{\operatorname{asin}(ax)}\,dx + \int \left(-\frac{1}{\operatorname{asin}(ax)}\right)dx\right)$$

```
[In] integrate((-a**2*c*x**2+c)**3/asin(a*x),x)
[Out] -c**3*(Integral(3*a**2*x**2/asin(a*x), x) + Integral(-3*a**4*x**4/asin(a*x)
, x) + Integral(a**6*x**6/asin(a*x), x) + Integral(-1/asin(a*x), x))
```

Maxima [F]

$$\int \frac{(c - a^2cx^2)^3}{\arcsin(ax)}\,dx = \int -\frac{(a^2cx^2 - c)^3}{\arcsin(ax)}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x),x, algorithm="maxima")
[Out] -integrate((a^2*c*x^2 - c)^3/arcsin(a*x), x)
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.88

$$\int \frac{(c - a^2cx^2)^3}{\arcsin(ax)}\,dx = \frac{c^3 \operatorname{Ci}(7 \arcsin(ax))}{64\,a} + \frac{7\,c^3 \operatorname{Ci}(5 \arcsin(ax))}{64\,a} + \frac{21\,c^3 \operatorname{Ci}(3 \arcsin(ax))}{64\,a} + \frac{35\,c^3 \operatorname{Ci}(\arcsin(ax))}{64\,a}$$

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x),x, algorithm="giac")
[Out] 1/64*c^3*cos_integral(7*arcsin(a*x))/a + 7/64*c^3*cos_integral(5*arcsin(a*x
))/a + 21/64*c^3*cos_integral(3*arcsin(a*x))/a + 35/64*c^3*cos_integral(arc
sin(a*x))/a
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(c - a^2cx^2)^3}{\arcsin(ax)}\,dx = \int \frac{(c - a^2\,c\,x^2)^3}{\operatorname{asin}(a\,x)}\,dx$$

```
[In] int((c - a^2*c*x^2)^3/asin(a*x),x)
[Out] int((c - a^2*c*x^2)^3/asin(a*x), x)
```

3.312 $\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)} dx$

Optimal result

Integrand size = 20, antiderivative size = 50

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)} dx = \frac{5c^2 \operatorname{CosIntegral}(\arcsin(ax))}{8a} + \frac{5c^2 \operatorname{CosIntegral}(3\arcsin(ax))}{16a} + \frac{c^2 \operatorname{CosIntegral}(5\arcsin(ax))}{16a}$$

```
[Out] 5/8*c^2*Ci(arcsin(a*x))/a+5/16*c^2*Ci(3*arcsin(a*x))/a+1/16*c^2*Ci(5*arcsin
(a*x))/a
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {4753, 3393, 3383}

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)} dx = \frac{5c^2 \operatorname{CosIntegral}(\arcsin(ax))}{8a} + \frac{5c^2 \operatorname{CosIntegral}(3\arcsin(ax))}{16a} + \frac{c^2 \operatorname{CosIntegral}(5\arcsin(ax))}{16a}$$

```
[In] Int[(c - a^2*c*x^2)^2/ArcSin[a*x],x]
```

```
[Out] (5*c^2*CosIntegral[ArcSin[a*x]])/(8*a) + (5*c^2*CosIntegral[3*ArcSin[a*x]])
/(16*a) + (c^2*CosIntegral[5*ArcSin[a*x]])/(16*a)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
```

```
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{c^2\text{Subst}\left(\int \frac{\cos^5(x)}{x}\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{c^2\text{Subst}\left(\int \left(\frac{5\cos(x)}{8x}+\frac{5\cos(3x)}{16x}+\frac{\cos(5x)}{16x}\right)\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{c^2\text{Subst}\left(\int \frac{\cos(5x)}{x}\,dx, x, \arcsin(ax)\right)}{16a}+\frac{(5c^2)\,\text{Subst}\left(\int \frac{\cos(3x)}{x}\,dx, x, \arcsin(ax)\right)}{16a}\\
&\quad+\frac{(5c^2)\,\text{Subst}\left(\int \frac{\cos(x)}{x}\,dx, x, \arcsin(ax)\right)}{8a}\\
&= \frac{5c^2\,\text{CosIntegral}(\arcsin(ax))}{8a}+\frac{5c^2\,\text{CosIntegral}(3\arcsin(ax))}{16a}+\frac{c^2\,\text{CosIntegral}(5\arcsin(ax))}{16a}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 34, normalized size of antiderivative = 0.68

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)}\,dx = \frac{c^2(10\,\text{CosIntegral}(\arcsin(ax))+5\,\text{CosIntegral}(3\arcsin(ax))+\text{CosIntegral}(5\arcsin(ax)))}{16a}$$

```
[In] Integrate[(c - a^2*c*x^2)^2/ArcSin[a*x],x]
[Out] (c^2*(10*CosIntegral[ArcSin[a*x]] + 5*CosIntegral[3*ArcSin[a*x]] + CosInteg
ral[5*ArcSin[a*x]]))/(16*a)
```

Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 33, normalized size of antiderivative = 0.66

method	result	size
derivativedivides	$\frac{c^{2}\left(10\,\mathrm{Ci}\left(\arcsin\left(a x\right)\right)+5\,\mathrm{Ci}\left(3 \arcsin\left(a x\right)\right)+\mathrm{Ci}\left(5 \arcsin\left(a x\right)\right)\right)}{16 a}$	33
default	$\frac{c^{2}\left(10\,\mathrm{Ci}\left(\arcsin\left(a x\right)\right)+5\,\mathrm{Ci}\left(3 \arcsin\left(a x\right)\right)+\mathrm{Ci}\left(5 \arcsin\left(a x\right)\right)\right)}{16 a}$	33

```
[In] int((-a^2*c*x^2+c)^2/arcsin(a*x),x,method=_RETURNVERBOSE)
[Out] 1/16/a*c^2*(10*Ci(arcsin(a*x))+5*Ci(3*arcsin(a*x))+Ci(5*arcsin(a*x)))
```

Fricas [F]

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)}\,dx = \int \frac{(a^2cx^2-c)^2}{\arcsin(ax)}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)/arcsin(a*x), x)
```

Sympy [F]

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)}\,dx = c^2\left(\int\left(-\frac{2a^2x^2}{\operatorname{asin}(ax)}\right)dx + \int\frac{a^4x^4}{\operatorname{asin}(ax)}\,dx + \int\frac{1}{\operatorname{asin}(ax)}\,dx\right)$$

```
[In] integrate((-a**2*c*x**2+c)**2/asin(a*x),x)
[Out] c**2*(Integral(-2*a**2*x**2/asin(a*x), x) + Integral(a**4*x**4/asin(a*x), x
) + Integral(1/asin(a*x), x))
```

Maxima [F]

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)}\,dx = \int \frac{(a^2cx^2-c)^2}{\arcsin(ax)}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 - c)^2/arcsin(a*x), x)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.88

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)}\,dx=\frac{c^2\,\mathrm{Ci}\,(5\,\arcsin\,(ax))}{16\,a}+\frac{5\,c^2\,\mathrm{Ci}\,(3\,\arcsin\,(ax))}{16\,a}+\frac{5\,c^2\,\mathrm{Ci}\,(\arcsin\,(ax))}{8\,a}$$

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="giac")
```

```
[Out] 1/16*c^2*cos_integral(5*arcsin(a*x))/a + 5/16*c^2*cos_integral(3*arcsin(a*x
))/a + 5/8*c^2*cos_integral(arcsin(a*x))/a
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)}\,dx=\int \frac{(c-a^2\,c\,x^2)^2}{\mathrm{asin}\,(a\,x)}\,dx$$

```
[In] int((c - a^2*c*x^2)^2/asin(a*x),x)
```

```
[Out] int((c - a^2*c*x^2)^2/asin(a*x), x)
```

3.313 $\int \frac{c-a^2cx^2}{\arcsin(ax)}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 29

$$\int \frac{c-a^2cx^2}{\arcsin(ax)}\,dx = \frac{3c\,\mathrm{CosIntegral}(\arcsin(ax))}{4a} + \frac{c\,\mathrm{CosIntegral}(3\arcsin(ax))}{4a}$$

```
[Out] 3/4*c*Ci(arcsin(a*x))/a+1/4*c*Ci(3*arcsin(a*x))/a
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4753, 3393, 3383}

$$\int \frac{c-a^2cx^2}{\arcsin(ax)}\,dx = \frac{3c\,\mathrm{CosIntegral}(\arcsin(ax))}{4a} + \frac{c\,\mathrm{CosIntegral}(3\arcsin(ax))}{4a}$$

```
[In] Int[(c - a^2*c*x^2)/ArcSin[a*x],x]
```

```
[Out] (3*c*CosIntegral[ArcSin[a*x]])/(4*a) + (c*CosIntegral[3*ArcSin[a*x]])/(4*a)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
```

```
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{c\text{Subst}\left(\int \frac{\cos^3(x)}{x}\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{c\text{Subst}\left(\int \left(\frac{3\cos(x)}{4x} + \frac{\cos(3x)}{4x}\right)\,dx, x, \arcsin(ax)\right)}{a}\\
&= \frac{c\text{Subst}\left(\int \frac{\cos(3x)}{x}\,dx, x, \arcsin(ax)\right)}{4a} + \frac{(3c)\text{Subst}\left(\int \frac{\cos(x)}{x}\,dx, x, \arcsin(ax)\right)}{4a}\\
&= \frac{3c\,\text{CosIntegral}(\arcsin(ax))}{4a} + \frac{c\,\text{CosIntegral}(3\arcsin(ax))}{4a}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.79

$$\int \frac{c - a^2cx^2}{\arcsin(ax)}\,dx = \frac{c(3\,\text{CosIntegral}(\arcsin(ax)) + \text{CosIntegral}(3\arcsin(ax)))}{4a}$$

```
[In] Integrate[(c - a^2*c*x^2)/ArcSin[a*x],x]
[Out] (c*(3*CosIntegral[ArcSin[a*x]] + CosIntegral[3*ArcSin[a*x]]))/(4*a)
```

Maple [A] (verified)

Time = 0.04 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.76

method	result	size
derivativedivides	$\frac{c(3\ \text{Ci}(\arcsin(ax))+\text{Ci}(3\arcsin(ax)))}{4a}$	22
default	$\frac{c(3\ \text{Ci}(\arcsin(ax))+\text{Ci}(3\arcsin(ax)))}{4a}$	22

```
[In] int((-a^2*c*x^2+c)/arcsin(a*x),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/a*c*(3*Ci(arcsin(a*x))+Ci(3*arcsin(a*x)))
```

Fricas [F]

$$\int \frac{c - a^2cx^2}{\arcsin(ax)} \, dx = \int -\frac{a^2cx^2 - c}{\arcsin(ax)} \, dx$$

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="fricas")
[Out] integral(-(a^2*c*x^2 - c)/arcsin(a*x), x)
```

Sympy [F]

$$\int \frac{c - a^2cx^2}{\arcsin(ax)} \, dx = -c\left(\int \frac{a^2x^2}{\operatorname{asin}(ax)} \, dx + \int \left(-\frac{1}{\operatorname{asin}(ax)}\right) \, dx\right)$$

```
[In] integrate((-a**2*c*x**2+c)/asin(a*x),x)
[Out] -c*(Integral(a**2*x**2/asin(a*x), x) + Integral(-1/asin(a*x), x))
```

Maxima [F]

$$\int \frac{c - a^2cx^2}{\arcsin(ax)} \, dx = \int -\frac{a^2cx^2 - c}{\arcsin(ax)} \, dx$$

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="maxima")
[Out] -integrate((a^2*c*x^2 - c)/arcsin(a*x), x)
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 25, normalized size of antiderivative = 0.86

$$\int \frac{c - a^2cx^2}{\arcsin(ax)} \, dx = \frac{c \operatorname{Ci}(3 \arcsin(ax))}{4a} + \frac{3 c \operatorname{Ci}(\arcsin(ax))}{4a}$$

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="giac")
[Out] 1/4*c*cos_integral(3*arcsin(a*x))/a + 3/4*c*cos_integral(arcsin(a*x))/a
```

Mupad [F(-1)]

Timed out.

$$\int \frac{c-a^2cx^2}{\arcsin(ax)}\,dx=\int \frac{c-a^2\,c\,x^2}{\mathrm{asin}\left(a\,x\right)}\,dx$$

```
[In] int((c - a^2*c*x^2)/asin(a*x),x)
[Out] int((c - a^2*c*x^2)/asin(a*x), x)
```

3.314 $\int \frac{1}{(c-a^2cx^2)\arcsin(ax)}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 20

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)}\,dx = \text{Int}\left(\frac{1}{(c-a^2cx^2)\arcsin(ax)},x\right)$$

```
[Out] Unintegrable(1/(-a^2*c*x^2+c)/arcsin(a*x),x)
```

Rubi [N/A]

Not integrable

Time = 0.02 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)}\,dx = \int \frac{1}{(c-a^2cx^2)\arcsin(ax)}\,dx$$

```
[In] Int[1/((c - a^2*c*x^2)*ArcSin[a*x]),x]
[Out] Defer[Int][1/((c - a^2*c*x^2)*ArcSin[a*x]), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(c-a^2cx^2)\arcsin(ax)}\,dx$$

Mathematica [N/A]

Not integrable

Time = 2.60 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)}\,dx = \int \frac{1}{(c-a^2cx^2)\arcsin(ax)}\,dx$$

```
[In] Integrate[1/((c - a^2*c*x^2)*ArcSin[a*x]),x]
[Out] Integrate[1/((c - a^2*c*x^2)*ArcSin[a*x]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.22 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00

$$\int \frac{1}{(-a^2c\,x^2+c)\arcsin(ax)}dx$$

```
[In] int(1/(-a^2*c*x^2+c)/arcsin(a*x),x)
[Out] int(1/(-a^2*c*x^2+c)/arcsin(a*x),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.20

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)}\,dx = \int -\frac{1}{(a^2cx^2-c)\arcsin(ax)}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="fricas")
[Out] integral(-1/((a^2*c*x^2 - c)*arcsin(a*x)), x)
```

Sympy [N/A]

Not integrable

Time = 0.75 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)}\,dx = -\frac{\int \frac{1}{a^2x^2\,\mathrm{asin}\,(ax)-\mathrm{asin}\,(ax)}\,dx}{c}$$

```
[In] integrate(1/(-a**2*c*x**2+c)/asin(a*x),x)
[Out] -Integral(1/(a**2*x**2*asin(a*x) - asin(a*x)), x)/c
```

Maxima [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.25

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)}\,dx = \int -\frac{1}{(a^2cx^2-c)\arcsin(ax)}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="maxima")
[Out] -integrate(1/((a^2*c*x^2 - c)*arcsin(a*x)), x)
```

Giac [N/A]

Not integrable

Time = 0.46 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.20

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)}\,dx = \int -\frac{1}{(a^2cx^2-c)\arcsin(ax)}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x),x, algorithm="giac")
[Out] integrate(-1/((a^2*c*x^2 - c)*arcsin(a*x)), x)
```

Mupad [N/A]

Not integrable

Time = 0.14 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)}\,dx = \int \frac{1}{\mathrm{asin}(a\,x)\,\left(c-a^2\,c\,x^2\right)}\,dx$$

```
[In] int(1/(asin(a*x)*(c - a^2*c*x^2)),x)
[Out] int(1/(asin(a*x)*(c - a^2*c*x^2)), x)
```

3.315 $\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)} dx$

Optimal result

Integrand size = 20, antiderivative size = 20

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)} dx = \text{Int}\left(\frac{1}{(c-a^2cx^2)^2 \arcsin(ax)}, x\right)$$

```
[Out] Unintegrable(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x)
```

Rubi [N/A]

Not integrable

Time = 0.02 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)} dx = \int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)} dx$$

```
[In] Int[1/((c - a^2*c*x^2)^2*ArcSin[a*x]),x]
[Out] Defer[Int][1/((c - a^2*c*x^2)^2*ArcSin[a*x]), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)} dx$$

Mathematica [N/A]

Not integrable

Time = 7.01 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)}\,dx = \int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)}\,dx$$

```
[In] Integrate[1/((c - a^2*c*x^2)^2*ArcSin[a*x]),x]
[Out] Integrate[1/((c - a^2*c*x^2)^2*ArcSin[a*x]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.45 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00

$$\int \frac{1}{\left(-a^2c\,x^2+c\right)^2 \arcsin\left(ax\right)}dx$$

```
[In] int(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x)
[Out] int(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.80

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)}\,dx = \int \frac{1}{(a^2cx^2-c)^2 \arcsin\left(ax\right)}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="fricas")
[Out] integral(1/((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)*arcsin(a*x)), x)
```

Sympy [N/A]

Not integrable

Time = 1.04 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.80

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)}\,dx = \frac{\int \frac{1}{a^4x^4\operatorname{asin}(ax)-2a^2x^2\operatorname{asin}(ax)+\operatorname{asin}(ax)}\,dx}{c^2}$$

```
[In] integrate(1/(-a**2*c*x**2+c)**2/asin(a*x),x)
[Out] Integral(1/(a**4*x**4*asin(a*x) - 2*a**2*x**2*asin(a*x) + asin(a*x)), x)/c*
*2
```

Maxima [N/A]

Not integrable

Time = 0.39 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.15

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)}\,dx = \int \frac{1}{(a^2cx^2-c)^2 \arcsin(ax)}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="maxima")
[Out] integrate(1/((a^2*c*x^2 - c)^2*arcsin(a*x)), x)
```

Giac [N/A]

Not integrable

Time = 1.13 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.15

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)}\,dx = \int \frac{1}{(a^2cx^2-c)^2 \arcsin(ax)}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x),x, algorithm="giac")
[Out] integrate(1/((a^2*c*x^2 - c)^2*arcsin(a*x)), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)}\,dx = \int \frac{1}{\mathrm{asin}(a\,x)\,\left(c-a^2\,c\,x^2\right)^2}\,dx$$

```
[In] int(1/(asin(a*x)*(c - a^2*c*x^2)^2),x)
[Out] int(1/(asin(a*x)*(c - a^2*c*x^2)^2), x)
```

3.316 $\int \frac{x^4\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 206

$$\int \frac{x^4\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = -\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^5} - \frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc^5} + \frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^5} + \frac{\log(a+b\arcsin(cx))}{16bc^5} - \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^5} - \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc^5} + \frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^5}$$

```
[Out] -1/32*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c^5-1/16*Ci(4*(a+b*arcsin(c*x)
)/b)*cos(4*a/b)/b/c^5+1/32*Ci(6*(a+b*arcsin(c*x))/b)*cos(6*a/b)/b/c^5+1/16*
ln(a+b*arcsin(c*x))/b/c^5-1/32*Si(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b/c^5-1
/16*Si(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b/c^5+1/32*Si(6*(a+b*arcsin(c*x))/
b)*sin(6*a/b)/b/c^5
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4809, 4491, 3384, 3380, 3383}

$$\int \frac{x^4\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = -\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^5} - \frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc^5} + \frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^5} - \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^5} - \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc^5} + \frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^5} + \frac{\log(a+b\arcsin(cx))}{16bc^5}$$

```
[In] Int[(x^4*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/32*(Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(b*c^5) - (Cos[
(4*a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c^5) + (Cos[(6*a)/b]
*CosIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^5) + Log[a + b*ArcSin[c*x]
]/(16*b*c^5) - (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*
c^5) - (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c^5) + (
Sin[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^5)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^5}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{16x}+\frac{\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)}{32x}-\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{16x}-\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{32x}\right)dx, x, a+b\arcsin(cx)\right)}{bc^5}\\
&= \frac{\log(a+b\arcsin(cx))}{16bc^5}+\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^5}\\
&\quad -\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^5}\\
&\quad -\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^5}\\
&= \frac{\log(a+b\arcsin(cx))}{16bc^5}-\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^5}\\
&\quad -\frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^5}\\
&\quad +\frac{\cos\left(\frac{6a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^5}\\
&\quad -\frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^5}\\
&\quad -\frac{\sin\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^5}\\
&\quad +\frac{\sin\left(\frac{6a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^5}
\end{aligned}$$

$$= -\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^5} - \frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc^5} + \frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^5} + \frac{\log(a+b\arcsin(cx))}{16bc^5} - \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^5} - \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc^5} + \frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^5}$$

Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 152, normalized size of antiderivative = 0.74

$$\int \frac{x^4\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = -\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)+2\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\arcsin(cx)\right)\right)-\cos\left(\frac{6a}{b}\right)\text{CosInt}}{}$$

```
[In] Integrate[(x^4*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/32*(Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + 2*Cos[(4*a)/b]*Cos
Integral[4*(a/b + ArcSin[c*x])] - Cos[(6*a)/b]*CosIntegral[6*(a/b + ArcSin[
c*x])] - 2*Log[a + b*ArcSin[c*x]] + Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSi
n[c*x])] + 2*Sin[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])] - Sin[(6*a)/b]
*SinIntegral[6*(a/b + ArcSin[c*x])])/(b*c^5)
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 157, normalized size of antiderivative = 0.76

method	result
default	$\frac{\text{Si}\left(6\arcsin(cx)+\frac{6a}{b}\right)\sin\left(\frac{6a}{b}\right)+\text{Ci}\left(6\arcsin(cx)+\frac{6a}{b}\right)\cos\left(\frac{6a}{b}\right)-2\,\text{Si}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)-2\,\text{Ci}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)-\text{Si}(2\,\text{ar}}{32c^5b}$

```
[In] int(x^4*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/c^5*(Si(6*arcsin(c*x)+6*a/b)*sin(6*a/b)+Ci(6*arcsin(c*x)+6*a/b)*cos(6*
a/b)-2*Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)-2*Ci(4*arcsin(c*x)+4*a/b)*cos(4*a
/b)-Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)-Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/b)+2
*ln(a+b*arcsin(c*x)))/b
```

Fricas [F]

$$\int \frac{x^4\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{-c^2x^2+1}x^4}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x^4*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^4/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{x^4\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^4\sqrt{-(cx-1)(cx+1)}}{a+b\,\mathrm{asin}\,(cx)}\,dx$$

```
[In] integrate(x**4*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**4*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{x^4\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{-c^2x^2+1}x^4}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x^4*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*x^2 + 1)*x^4/(b*arcsin(c*x) + a), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 472 vs. $2(192) = 384$.

Time = 0.32 (sec) , antiderivative size = 472, normalized size of antiderivative = 2.29

$$\int \frac{x^4\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \frac{\cos\left(\frac{a}{b}\right)^6 \operatorname{Ci}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{bc^5} + \frac{\cos\left(\frac{a}{b}\right)^5 \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{bc^5} - \frac{3\cos\left(\frac{a}{b}\right)^4 \operatorname{Ci}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{2bc^5} - \frac{\cos\left(\frac{a}{b}\right)^4 \operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{2bc^5} - \frac{\cos\left(\frac{a}{b}\right)^3 \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{bc^5} - \frac{\cos\left(\frac{a}{b}\right)^3 \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{2bc^5} + \frac{9\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{16bc^5} + \frac{\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{2bc^5} - \frac{\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{16bc^5} + \frac{3\cos\left(\frac{a}{b}\right) \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{16bc^5} + \frac{\cos\left(\frac{a}{b}\right) \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{4bc^5} - \frac{\cos\left(\frac{a}{b}\right) \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{16bc^5} - \frac{\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{32bc^5} - \frac{\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{16bc^5} + \frac{\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{32bc^5} + \frac{\log(b\arcsin(cx)+a)}{16bc^5}$$

```
[In] integrate(x^4*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^6*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^5) + cos(a/b)^5*sin(a/b
)*sin_integral(6*a/b + 6*arcsin(c*x))/(b*c^5) - 3/2*cos(a/b)^4*cos_integral
(6*a/b + 6*arcsin(c*x))/(b*c^5) - 1/2*cos(a/b)^4*cos_integral(4*a/b + 4*arc
sin(c*x))/(b*c^5) - cos(a/b)^3*sin(a/b)*sin_integral(6*a/b + 6*arcsin(c*x))
/(b*c^5) - 1/2*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c
^5) + 9/16*cos(a/b)^2*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^5) + 1/2*cos
(a/b)^2*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) - 1/16*cos(a/b)^2*cos_i
ntegral(2*a/b + 2*arcsin(c*x))/(b*c^5) + 3/16*cos(a/b)*sin(a/b)*sin_integra
l(6*a/b + 6*arcsin(c*x))/(b*c^5) + 1/4*cos(a/b)*sin(a/b)*sin_integral(4*a/b
```

```
 + 4*arcsin(c*x))/(b*c^5) - 1/16*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*a
rcsin(c*x))/(b*c^5) - 1/32*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^5) - 1/
16*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) + 1/32*cos_integral(2*a/b +
2*arcsin(c*x))/(b*c^5) + 1/16*log(b*arcsin(c*x) + a)/(b*c^5)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx=\int \frac{x^4\,\sqrt{1-c^2\,x^2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((x^4*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)),x)
[Out] int((x^4*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)), x)
```

3.317 $\int \frac{x^3\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 183

$$\int \frac{x^3\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = -\frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8bc^4} - \frac{\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16bc^4} + \frac{\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{16bc^4} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^4} + \frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^4} - \frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^4}$$

```
[Out] 1/8*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^4+1/16*cos(3*a/b)*Si(3*(a+b*arcsin
(c*x))/b)/b/c^4-1/16*cos(5*a/b)*Si(5*(a+b*arcsin(c*x))/b)/b/c^4-1/8*Ci((a+b
*arcsin(c*x))/b)*sin(a/b)/b/c^4-1/16*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b
/c^4+1/16*Ci(5*(a+b*arcsin(c*x))/b)*sin(5*a/b)/b/c^4
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used

$= \{4809, 4491, 3384, 3380, 3383\}$

$$\int \frac{x^3\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = -\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^4} - \frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^4} + \frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^4} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^4} + \frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^4} - \frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^4}$$

```
[In] Int[(x^3*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/8*(CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b*c^4) - (CosIntegral[(
3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b*c^4) + (CosIntegral[(5*(a + b
*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(16*b*c^4) + (Cos[a/b]*SinIntegral[(a + b*A
rcSin[c*x])/b])/(8*b*c^4) + (Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]
))/b])/(16*b*c^4) - (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(
16*b*c^4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\text{Subst}\left(\int \frac{\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^4} \\
&= -\frac{\text{Subst}\left(\int \left(-\frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x}+\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x}+\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right)dx, x, a+b\arcsin(cx)\right)}{bc^4} \\
&= \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^4} \\
&\quad -\frac{\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^4} \\
&\quad -\frac{\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8bc^4} \\
&= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8bc^4} \\
&\quad +\frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^4} \\
&\quad -\frac{\cos\left(\frac{5a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^4} \\
&\quad -\frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8bc^4} \\
&\quad -\frac{\sin\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^4} \\
&\quad +\frac{\sin\left(\frac{5a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^4}
\end{aligned}$$

$$= -\frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8bc^4} - \frac{\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16bc^4} + \frac{\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{16bc^4} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^4} + \frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^4} - \frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^4}$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.74

$$\int \frac{x^3\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \frac{-2\,\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right) - \text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{3a}{b}\right) + \text{CosIntegral}\left(5\left(\frac{a}{b}+\right.\right.}{}$$

```
[In] Integrate[(x^3*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-2*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - CosIntegral[3*(a/b + ArcSin[c
*x])]*Sin[(3*a)/b] + CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b] + 2*Co
s[a/b]*SinIntegral[a/b + ArcSin[c*x]] + Cos[(3*a)/b]*SinIntegral[3*(a/b + A
rcSin[c*x])] - Cos[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*b*c^4)
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.75

method	result
default	$-\frac{\text{Ci}\left(3\arcsin(cx)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)-\text{Ci}\left(5\arcsin(cx)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)+2\,\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)-2\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-\text{Si}(3\,\text{arcs}}{16c^4b}$

```
[In] int(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/16/c^4*(Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)-Ci(5*arcsin(c*x)+5*a/b)*sin(5
*a/b)+2*Ci(arcsin(c*x)+a/b)*sin(a/b)-2*Si(arcsin(c*x)+a/b)*cos(a/b)-Si(3*ar
csin(c*x)+3*a/b)*cos(3*a/b)+Si(5*arcsin(c*x)+5*a/b)*cos(5*a/b))/b
```

Fricas [F]

$$\int \frac{x^3\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{-c^2x^2+1}x^3}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^3/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{x^3\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^3\sqrt{-(cx-1)(cx+1)}}{a+b\operatorname{asin}(cx)}\,dx$$

```
[In] integrate(x**3*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**3*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{x^3\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{-c^2x^2+1}x^3}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*x^2 + 1)*x^3/(b*arcsin(c*x) + a), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^3\,\sqrt{1-c^2\,x^2}}{a+b\,\mathrm{asin}\,(c\,x)}\,dx$$

```
[In] int((x^3*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)),x)
[Out] int((x^3*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)), x)
```

3.318 $\int \frac{x^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 82

$$\int \frac{x^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = -\frac{\cos\left(\frac{4a}{b}\right)\operatorname{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc^3} + \frac{\log(a+b\arcsin(cx))}{8bc^3} - \frac{\sin\left(\frac{4a}{b}\right)\operatorname{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc^3}$$

```
[Out] -1/8*Ci(4*(a+b*arcsin(c*x))/b)*cos(4*a/b)/b/c^3+1/8*ln(a+b*arcsin(c*x))/b/c
^3-1/8*Si(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b/c^3
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4809, 4491, 3384, 3380, 3383}

$$\int \frac{x^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = -\frac{\cos\left(\frac{4a}{b}\right)\operatorname{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc^3} - \frac{\sin\left(\frac{4a}{b}\right)\operatorname{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc^3} + \frac{\log(a+b\arcsin(cx))}{8bc^3}$$

```
[In] Int[(x^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/8*(Cos[(4*a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(b*c^3) + Log[a
+ b*ArcSin[c*x]]/(8*b*c^3) - (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x
]))/b])/(8*b*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int \frac{\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^3}\\ &= \frac{\text{Subst}\left(\int \left(\frac{1}{8x}-\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8x}\right)\,dx, x, a+b\arcsin(cx)\right)}{bc^3}\\ &= \frac{\log(a+b\arcsin(cx))}{8bc^3}-\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8bc^3}\end{aligned}$$

$$= \frac{\log(a + b\arcsin(cx))}{8bc^3} - \frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx, x, a + b\arcsin(cx)\right)}{8bc^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx, x, a + b\arcsin(cx)\right)}{8bc^3}$$

$$= -\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc^3} + \frac{\log(a + b\arcsin(cx))}{8bc^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc^3}$$

Mathematica [A] (verified)

Time = 0.25 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.80

$$\int \frac{x^2\sqrt{1 - c^2x^2}}{a + b\arcsin(cx)}\,dx = -\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b} + \arcsin(cx)\right)\right) - \log(8(a + b\arcsin(cx))) + \sin\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b} + \arcsin(cx)\right)\right)}{8bc^3}$$

```
[In] Integrate[(x^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
[Out] -1/8*(Cos[(4*a)/b]*CosIntegral[4*(a/b + ArcSin[c*x])] - Log[8*(a + b*ArcSin
[c*x])] + Sin[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])])/(b*c^3)
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.79

method	result	size
default	$-\frac{\text{Si}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)+\text{Ci}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)-\ln(a+b\arcsin(cx))}{8c^3b}$	65

```
[In] int(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] -1/8/c^3*(Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)+Ci(4*arcsin(c*x)+4*a/b)*cos(4*
a/b)-ln(a+b*arcsin(c*x)))/b
```

Fricas [F]

$$\int \frac{x^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{-c^2x^2+1}x^2}{b\arcsin{(cx)}+a}\,dx$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^2/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{x^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^2\sqrt{-(cx-1)(cx+1)}}{a+b\operatorname{asin}{(cx)}}\,dx$$

```
[In] integrate(x**2*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**2*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{x^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{-c^2x^2+1}x^2}{b\arcsin{(cx)}+a}\,dx$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*x^2 + 1)*x^2/(b*arcsin(c*x) + a), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 169 vs. 2(76) = 152.

Time = 0.32 (sec) , antiderivative size = 169, normalized size of antiderivative = 2.06

$$\begin{aligned}\int \frac{x^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = &-\frac{\cos\left(\frac{a}{b}\right)^4\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin{(cx)}\right)}{bc^3}\\&-\frac{\cos\left(\frac{a}{b}\right)^3\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin{(cx)}\right)}{bc^3}\\&+\frac{\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin{(cx)}\right)}{bc^3}\\&+\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin{(cx)}\right)}{2\,bc^3}\\&-\frac{\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin{(cx)}\right)}{8\,bc^3}+\frac{\log\left(b\arcsin{(cx)}+a\right)}{8\,bc^3}\end{aligned}$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) - cos(a/b)^3*sin(a/
b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) + cos(a/b)^2*cos_integral(4*
a/b + 4*arcsin(c*x))/(b*c^3) + 1/2*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4
*arcsin(c*x))/(b*c^3) - 1/8*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) + 1
/8*log(b*arcsin(c*x) + a)/(b*c^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^2\,\sqrt{1-c^2\,x^2}}{a+b\,\mathrm{asin}\,(c\,x)}\,dx$$

```
[In] int((x^2*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)),x)
```

```
[Out] int((x^2*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)), x)
```

3.319 $\int \frac{x\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 121

$$\int \frac{x\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = -\frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4bc^2} - \frac{\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4bc^2} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4bc^2} + \frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4bc^2}$$

```
[Out] 1/4*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^2+1/4*cos(3*a/b)*Si(3*(a+b*arcsin(
c*x))/b)/b/c^2-1/4*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b/c^2-1/4*Ci(3*(a+b*arc
sin(c*x))/b)*sin(3*a/b)/b/c^2
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4809, 4491, 3384, 3380, 3383}

$$\int \frac{x\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = -\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4bc^2} - \frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4bc^2} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4bc^2} + \frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4bc^2}$$

```
[In] Int[(x*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/4*(CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b*c^2) - (CosIntegral[(
3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b*c^2) + (Cos[a/b]*SinIntegral[(
a + b*ArcSin[c*x])/b])/(4*b*c^2) + (Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcS
in[c*x]))/b])/(4*b*c^2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{\text{Subst}\left(\int \frac{\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^2}$$

$$= -\frac{\text{Subst}\left(\int \left(\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)\,dx, x, a+b\arcsin(cx)\right)}{bc^2}$$

$$= -\frac{\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4bc^2} - \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4bc^2}$$

$$= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4bc^2} + \frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4bc^2} - \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4bc^2} - \frac{\sin\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4bc^2}$$

$$= -\frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4bc^2} - \frac{\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4bc^2} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4bc^2} + \frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4bc^2}$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 91, normalized size of antiderivative = 0.75

$$\int \frac{x\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \frac{-\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right) - \text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{3a}{b}\right) + \cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{arcsi}\right.}{4bc^2}$$

```
[In] Integrate[(x*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-(CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b]) - CosIntegral[3*(a/b + ArcSin[c
*x])]*Sin[(3*a)/b] + Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + Cos[(3*a)/b]
*SinIntegral[3*(a/b + ArcSin[c*x])])/(4*b*c^2)
```

Maple [A] (verified)

Time = 0.10 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.76

method	result	size
default	$\frac{\text{Si}\left(3\arcsin(cx)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)-\text{Ci}\left(3\arcsin(cx)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)+\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{4c^2b}$	92

```
[In] int(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

[Out] 1/4/c^2*(Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)+Si(arcsin(c*x)+a/b)*cos(a/b)-Ci(arcsin(c*x)+a/b)*sin(a/b))/b

Fricas [F]

$$\int \frac{x\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx=\int \frac{\sqrt{-c^2x^2+1}x}{b\arcsin(cx)+a}\,dx$$

[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] integral(sqrt(-c^2*x^2 + 1)*x/(b*arcsin(c*x) + a), x)

Sympy [F]

$$\int \frac{x\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx=\int \frac{x\sqrt{-(cx-1)(cx+1)}}{a+b\,\mathrm{asin}\,(cx)}\,dx$$

[In] integrate(x*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)

[Out] Integral(x*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)

Maxima [F]

$$\int \frac{x\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx=\int \frac{\sqrt{-c^2x^2+1}x}{b\arcsin(cx)+a}\,dx$$

[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] integrate(sqrt(-c^2*x^2 + 1)*x/(b*arcsin(c*x) + a), x)

Giac [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.42

$$\begin{aligned}\int \frac{x\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx=&-\frac{\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2}\\&+\frac{\cos\left(\frac{a}{b}\right)^3\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^2}\\&+\frac{\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{4bc^2}-\frac{\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{4bc^2}\\&-\frac{3\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^2}+\frac{\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^2}\end{aligned}$$

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) + cos(a/b)
^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^2) + 1/4*cos_integral(3*a/b + 3
*arcsin(c*x))*sin(a/b)/(b*c^2) - 1/4*cos_integral(a/b + arcsin(c*x))*sin(a/
b)/(b*c^2) - 3/4*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^2) + 1/4
*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{x\,\sqrt{1-c^2\,x^2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((x*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)),x)
```

```
[Out] int((x*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)), x)
```

3.320 $\int \frac{\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 82

$$\int \frac{\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx=\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc}+\frac{\log(a+b\arcsin(cx))}{2bc}+\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc}$$

```
[Out] 1/2*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c+1/2*ln(a+b*arcsin(c*x))/b/c+1/
2*Si(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b/c
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4753, 3393, 3384, 3380, 3383}

$$\int \frac{\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx=\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc}+\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc}+\frac{\log(a+b\arcsin(cx))}{2bc}$$

```
[In] Int[Sqrt[1 - c^2*x^2]/(a + b*ArcSin[c*x]),x]
```

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(2*b*c) + Log[a + b*A
rcSin[c*x]]/(2*b*c) + (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])
/(2*b*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{2x}+\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\right)\,dx, x, a+b\arcsin(cx)\right)}{bc}\\
&= \frac{\log(a+b\arcsin(cx))}{2bc}+\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc}\\
&= \frac{\log(a+b\arcsin(cx))}{2bc}+\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc}\\
&\quad+\frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc}
\end{aligned}
$$

$$= \frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc} + \frac{\log(a+b\arcsin(cx))}{2bc} + \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc}$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.76

$$\int \frac{\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx$$
$$= \frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)+\log(a+b\arcsin(cx))+\sin\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)}{2bc}$$

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(a + b*ArcSin[c*x]),x]
[Out] (Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + Log[a + b*ArcSin[c*x]] +
 Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(2*b*c)
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.77

method	result	size
default	$\frac{\text{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)+\text{Ci}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)+\ln(a+b\arcsin(cx))}{2cb}$	63

```
[In] int((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] 1/2/c*(Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)+Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/b
)+ln(a+b*arcsin(c*x)))/b
```

Fricas [F]

$$\int \frac{\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{-(cx-1)(cx+1)}}{a+b\operatorname{asin}(cx)}\,dx$$

[In] integrate((-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)

[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)

Maxima [F]

$$\int \frac{\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{b\arcsin(cx)+a}\,dx$$

[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] integrate(sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 102, normalized size of antiderivative = 1.24

$$\begin{aligned}\int \frac{\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx &= \frac{\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc} \\ &\quad+\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc} \\ &\quad-\frac{\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc}+\frac{\log(b\arcsin(cx)+a)}{2bc}\end{aligned}$$

[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")

[Out] cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c) + cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c) - 1/2*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c) + 1/2*log(b*arcsin(c*x) + a)/(b*c)

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx=\int \frac{\sqrt{1-c^2\,x^2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((1 - c^2*x^2)^(1/2)/(a + b*asin(c*x)),x)
[Out] int((1 - c^2*x^2)^(1/2)/(a + b*asin(c*x)), x)
```

3.321 $\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))}\,dx = \frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b} - \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b} + \text{Int}\left(\frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))},x\right)$$

```
[Out] -cos(a/b)*Si((a+b*arcsin(c*x))/b)/b+Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b+Unin
tegrable(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))}\,dx$$

```
[In] Int[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])),x]
```

```
[Out] (CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/b - (Cos[a/b]*SinIntegral[(a
+ b*ArcSin[c*x])/b])/b + Defer[Int][1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*
x])), x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(\frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}-\frac{c^2x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\right)dx\\
&= -\left(c^2\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\right)+\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b}+\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= -\frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b}\\
&\quad+\frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b}\\
&\quad+\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= \frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b}-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b}\\
&\quad+\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx
\end{aligned}
$$

Mathematica [N/A]

Not integrable

Time = 3.49 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$
\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))}\,dx=\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))}\,dx
$$

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])),x]
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.18 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{\sqrt{-c^2x^2+1}}{x\left(a+b\arcsin\left(cx\right)\right)}dx$$

```
[In] int((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin\left(cx\right)+a)x}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*x*arcsin(c*x) + a*x), x)
```

Sympy [N/A]

Not integrable

Time = 0.76 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{x\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(1/2)/x/(a+b*asin(c*x)),x)
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin\left(cx\right)+a)x}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{\sqrt{1-c^2\,x^2}}{x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

```
[In] int((1 - c^2*x^2)^(1/2)/(x*(a + b*asin(c*x))),x)
```

```
[Out] int((1 - c^2*x^2)^(1/2)/(x*(a + b*asin(c*x))), x)
```

3.322 $\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))} dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))} dx = -\frac{c\log(a+b\arcsin(cx))}{b} + \text{Int}\left(\frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}, x\right)$$

```
[Out] -c*ln(a+b*arcsin(c*x))/b+Unintegrable(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^
(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.20 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))} dx = \int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))} dx$$

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])),x]
```

```
[Out] -((c*Log[a + b*ArcSin[c*x]])/b) + Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])), x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(-\frac{c^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}+\frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\right)dx\\
&= -\left(c^2\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\right)+\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= -\frac{c\log(a+b\arcsin(cx))}{b}+\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx
\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 1.85 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))}\,dx=\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])),x]
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.20 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{\sqrt{-c^2x^2+1}}{x^2\left(a+b\arcsin\left(cx\right)\right)}dx$$

```
[In] int((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.14

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))}\,dx=\int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin\left(cx\right)+a)x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*x^2*arcsin(c*x) + a*x^2), x)
```

Sympy [N/A]

Not integrable

Time = 0.65 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))}\,dx=\int \frac{\sqrt{-(cx-1)\,(cx+1)}}{x^2\,(a+b\,\mathrm{asin}\,(cx))}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**2/(a+b*asin(c*x)),x)
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**2*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))}\,dx=\int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^2), x)
```

Giac [N/A]

Not integrable

Time = 0.47 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))}\,dx=\int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))}\,dx=\int \frac{\sqrt{1-c^2\,x^2}}{x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

```
[In] int((1 - c^2*x^2)^(1/2)/(x^2*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(1/2)/(x^2*(a + b*asin(c*x))), x)
```

3.323 $\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))}\,dx=\text{Int}\left(\frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.08 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))}\,dx=\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))}\,dx$$

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral}=\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 4.79 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))}\,dx=\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])),x]
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.78 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{\sqrt{-c^2x^2+1}}{x^3\left(a+b\arcsin\left(cx\right)\right)}dx$$

```
[In] int((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.14

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))}\,dx=\int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin\left(cx\right)+a)x^3}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*x^3*arcsin(c*x) + a*x^3), x)
```

Sympy [N/A]

Not integrable

Time = 0.71 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))}\,dx=\int \frac{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{x^3\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**3/(a+b*asin(c*x)),x)
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**3*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)x^3}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^3), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))}\,dx = \int \frac{\sqrt{1-c^2\,x^2}}{x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

```
[In] int((1 - c^2*x^2)^(1/2)/(x^3*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(1/2)/(x^3*(a + b*asin(c*x))), x)
```

3.324 $\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))}\,dx=\operatorname{Int}\left(\frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.08 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))}\,dx=\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))}\,dx$$

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral}=\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 1.21 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])),x]
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.93 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{\sqrt{-c^2x^2+1}}{x^4\left(a+b\arcsin\left(cx\right)\right)}dx$$

```
[In] int((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.14

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin\left(cx\right)+a)x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(b*x^4*arcsin(c*x) + a*x^4), x)
```

Sympy [N/A]

Not integrable

Time = 0.82 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{x^4\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**4/(a+b*asin(c*x)),x)
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**4*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^4), x)
```

Giac [N/A]

Not integrable

Time = 1.24 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)*x^4), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{\sqrt{1-c^2\,x^2}}{x^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

```
[In] int((1 - c^2*x^2)^(1/2)/(x^4*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(1/2)/(x^4*(a + b*asin(c*x))), x)
```

3.325 $\int \frac{x^3(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 245

$$\begin{aligned}\int \frac{x^3(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx &= -\frac{3\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{64bc^4} \\ &- \frac{3\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{64bc^4} \\ &+ \frac{\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{64bc^4} + \frac{\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{7a}{b}\right)}{64bc^4} \\ &+ \frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64bc^4} + \frac{3\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64bc^4} \\ &- \frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64bc^4} - \frac{\cos\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64bc^4}\end{aligned}$$

```
[Out] 3/64*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^4+3/64*cos(3*a/b)*Si(3*(a+b*arcsi
n(c*x))/b)/b/c^4-1/64*cos(5*a/b)*Si(5*(a+b*arcsin(c*x))/b)/b/c^4-1/64*cos(7
*a/b)*Si(7*(a+b*arcsin(c*x))/b)/b/c^4-3/64*Ci((a+b*arcsin(c*x))/b)*sin(a/b)
/b/c^4-3/64*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b/c^4+1/64*Ci(5*(a+b*arcsi
n(c*x))/b)*sin(5*a/b)/b/c^4+1/64*Ci(7*(a+b*arcsin(c*x))/b)*sin(7*a/b)/b/c^4
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {4809, 4491, 3384, 3380, 3383}

$$\int \frac{x^3(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = -\frac{3\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64bc^4} - \frac{3\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64bc^4} + \frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64bc^4} + \frac{\sin\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64bc^4} + \frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64bc^4} + \frac{3\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64bc^4} - \frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64bc^4} - \frac{\cos\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64bc^4}$$

```
[In] Int[(x^3*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-3*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(64*b*c^4) - (3*CosIntegra
l[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(64*b*c^4) + (CosIntegral[(5*(a
+ b*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(64*b*c^4) + (CosIntegral[(7*(a + b*ArcS
in[c*x]))/b]*Sin[(7*a)/b])/(64*b*c^4) + (3*Cos[a/b]*SinIntegral[(a + b*ArcS
in[c*x])/b])/(64*b*c^4) + (3*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]
))/b])/(64*b*c^4) - (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(
64*b*c^4) - (Cos[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/(64*b*c^4
)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
```

```
NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{\text{Subst}\left(\int \frac{\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^4}$$

$$= -\frac{\text{Subst}\left(\int \left(-\frac{\sin\left(\frac{7a}{b}-\frac{7x}{b}\right)}{64x}-\frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{64x}+\frac{3\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{64x}+\frac{3\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{64x}\right)dx, x, a+b\arcsin(cx)\right)}{bc^4}$$

$$= \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{7a}{b}-\frac{7x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64bc^4} + \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64bc^4} - \frac{3\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64bc^4} - \frac{3\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64bc^4}$$

$$
\begin{aligned}
&= \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^4} \\
&+ \frac{\left(3\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^4} \\
&- \frac{\cos\left(\frac{5a}{b}\right)\text{Subst}\left(\int\frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^4} \\
&- \frac{\cos\left(\frac{7a}{b}\right)\text{Subst}\left(\int\frac{\sin\left(\frac{7x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^4} \\
&- \frac{\left(3\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^4} \\
&- \frac{\left(3\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^4} \\
&+ \frac{\sin\left(\frac{5a}{b}\right)\text{Subst}\left(\int\frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^4} \\
&+ \frac{\sin\left(\frac{7a}{b}\right)\text{Subst}\left(\int\frac{\cos\left(\frac{7x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^4} \\
&= -\frac{3\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{64bc^4} - \frac{3\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{64bc^4} \\
&+ \frac{\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{64bc^4} + \frac{\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{7a}{b}\right)}{64bc^4} \\
&+ \frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64bc^4} + \frac{3\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64bc^4} \\
&- \frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64bc^4} - \frac{\cos\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64bc^4}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.76 (sec) , antiderivative size = 179, normalized size of antiderivative = 0.73

$$
\int \frac{x^3(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \frac{-3\,\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right) - 3\,\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{3a}{b}\right)
$$

```
[In] Integrate[(x^3*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-3*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 3*CosIntegral[3*(a/b + ArcSin
[c*x])]*Sin[(3*a)/b] + CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b] + Co
sIntegral[7*(a/b + ArcSin[c*x])]*Sin[(7*a)/b] + 3*Cos[a/b]*SinIntegral[a/b
```

```
+ ArcSin[c*x]] + 3*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] - Cos[(5
*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])] - Cos[(7*a)/b]*SinIntegral[7*(a/b
 + ArcSin[c*x])])/(64*b*c^4)
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 184, normalized size of antiderivative = 0.75

method	result
default	$-\frac{\mathrm{Si}\left(5 \arcsin(cx)+\frac{5a}{b}\right) \cos\left(\frac{5a}{b}\right)-\mathrm{Ci}\left(5 \arcsin(cx)+\frac{5a}{b}\right) \sin\left(\frac{5a}{b}\right)-3\ \mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right) \cos\left(\frac{a}{b}\right)+3\ \mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right) \sin\left(\frac{a}{b}\right)-3\ \mathrm{Si}(3 \mathrm{ar}}{64c^4b}$

```
[In] int(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] -1/64/c^4*(Si(5*arcsin(c*x)+5*a/b)*cos(5*a/b)-Ci(5*arcsin(c*x)+5*a/b)*sin(5
*a/b)-3*Si(arcsin(c*x)+a/b)*cos(a/b)+3*Ci(arcsin(c*x)+a/b)*sin(a/b)-3*Si(3*
arcsin(c*x)+3*a/b)*cos(3*a/b)+3*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)+Si(7*arc
sin(c*x)+7*a/b)*cos(7*a/b)-Ci(7*arcsin(c*x)+7*a/b)*sin(7*a/b))/b
```

Fricas [F]

$$\int \frac{x^3(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x^3}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] integral(-(c^2*x^5 - x^3)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{x^3(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^3(-(cx-1)(cx+1))^{\frac{3}{2}}}{a+b\,\mathrm{asin}(cx)}\,dx$$

```
[In] integrate(x**3*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)

[Out] Integral(x**3*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{x^3(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x^3}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(3/2)*x^3/(b*arcsin(c*x) + a), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 614 vs. 2(229) = 458.

Time = 0.34 (sec) , antiderivative size = 614, normalized size of antiderivative = 2.51

$$\begin{aligned}
\int \frac{x^3(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx &= \frac{\cos\left(\frac{a}{b}\right)^6 \operatorname{Ci}\left(\frac{7a}{b}+7\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^4} \\
&- \frac{\cos\left(\frac{a}{b}\right)^7 \operatorname{Si}\left(\frac{7a}{b}+7\arcsin(cx)\right)}{bc^4} \\
&- \frac{5\cos\left(\frac{a}{b}\right)^4 \operatorname{Ci}\left(\frac{7a}{b}+7\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{4bc^4} \\
&+ \frac{\cos\left(\frac{a}{b}\right)^4 \operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{4bc^4} \\
&+ \frac{7\cos\left(\frac{a}{b}\right)^5 \operatorname{Si}\left(\frac{7a}{b}+7\arcsin(cx)\right)}{4bc^4} - \frac{\cos\left(\frac{a}{b}\right)^5 \operatorname{Si}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{4bc^4} \\
&+ \frac{3\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{7a}{b}+7\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{8bc^4} \\
&- \frac{3\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{16bc^4} \\
&- \frac{3\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{16bc^4} \\
&- \frac{7\cos\left(\frac{a}{b}\right)^3 \operatorname{Si}\left(\frac{7a}{b}+7\arcsin(cx)\right)}{8bc^4} \\
&+ \frac{5\cos\left(\frac{a}{b}\right)^3 \operatorname{Si}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{16bc^4} + \frac{3\cos\left(\frac{a}{b}\right)^3 \operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{16bc^4} \\
&- \frac{\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{64bc^4} + \frac{\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{64bc^4} \\
&+ \frac{3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{64bc^4} - \frac{3\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{64bc^4} \\
&+ \frac{7\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{7a}{b}+7\arcsin(cx)\right)}{64bc^4} - \frac{5\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{64bc^4} \\
&- \frac{9\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{64bc^4} + \frac{3\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{64bc^4}
\end{aligned}$$

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^6*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) - cos(a/b)^
7*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^4) - 5/4*cos(a/b)^4*cos_integral
(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) + 1/4*cos(a/b)^4*cos_integral(5*a/
b + 5*arcsin(c*x))*sin(a/b)/(b*c^4) + 7/4*cos(a/b)^5*sin_integral(7*a/b + 7
*arcsin(c*x))/(b*c^4) - 1/4*cos(a/b)^5*sin_integral(5*a/b + 5*arcsin(c*x))/
(b*c^4) + 3/8*cos(a/b)^2*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^
4) - 3/16*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^4) -
 3/16*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^4) - 7/8
*cos(a/b)^3*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^4) + 5/16*cos(a/b)^3*s
in_integral(5*a/b + 5*arcsin(c*x))/(b*c^4) + 3/16*cos(a/b)^3*sin_integral(3
*a/b + 3*arcsin(c*x))/(b*c^4) - 1/64*cos_integral(7*a/b + 7*arcsin(c*x))*si
n(a/b)/(b*c^4) + 1/64*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^4)
+ 3/64*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^4) - 3/64*cos_inte
gral(a/b + arcsin(c*x))*sin(a/b)/(b*c^4) + 7/64*cos(a/b)*sin_integral(7*a/b
 + 7*arcsin(c*x))/(b*c^4) - 5/64*cos(a/b)*sin_integral(5*a/b + 5*arcsin(c*x
))/(b*c^4) - 9/64*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^4) + 3/
64*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^4)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^3\,{\left(1-c^2\,x^2\right)}^{3/2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((x^3*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)),x)
```

```
[Out] int((x^3*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)), x)
```

3.326 $\int \frac{x^2(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 206

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc^3} - \frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^3} + \frac{\log(a+b\arcsin(cx))}{16bc^3} + \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc^3} - \frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^3}$$

```
[Out] 1/32*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c^3-1/16*Ci(4*(a+b*arcsin(c*x))
/b)*cos(4*a/b)/b/c^3-1/32*Ci(6*(a+b*arcsin(c*x))/b)*cos(6*a/b)/b/c^3+1/16*l
n(a+b*arcsin(c*x))/b/c^3+1/32*Si(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b/c^3-1/
16*Si(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b/c^3-1/32*Si(6*(a+b*arcsin(c*x))/b
)*sin(6*a/b)/b/c^3
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4809, 4491, 3384, 3380, 3383}

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc^3} - \frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^3} + \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc^3} - \frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^3} + \frac{\log(a+b\arcsin(cx))}{16bc^3}$$

```
[In] Int[(x^2*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Cos[(4*
a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c^3) - (Cos[(6*a)/b]*Co
sIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) + Log[a + b*ArcSin[c*x]]/(
16*b*c^3) + (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c^3
) - (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c^3) - (Sin
[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^3}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{1}{16x}-\frac{\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)}{32x}-\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{16x}+\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{32x}\right)dx, x, a+b\arcsin(cx)\right)}{bc^3}$$

$$= \frac{\log(a+b\arcsin(cx))}{16bc^3} - \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^3} + \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^3} - \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^3}$$

$$= \frac{\log(a+b\arcsin(cx))}{16bc^3} + \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^3} - \frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^3} - \frac{\cos\left(\frac{6a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^3} + \frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^3} - \frac{\sin\left(\frac{6a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^3}$$

$$= \frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc^3} - \frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^3} + \frac{\log(a+b\arcsin(cx))}{16bc^3} + \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc^3} - \frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^3}$$

Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 165, normalized size of antiderivative = 0.80

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = -\frac{-\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)+2\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\arcsin(cx)\right)\right)+\cos\left(\frac{6a}{b}\right)\text{CosIn}}{}$$

```
[In] Integrate[(x^2*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/32*(-(Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])]) + 2*Cos[(4*a)/b]*
CosIntegral[4*(a/b + ArcSin[c*x])] + Cos[(6*a)/b]*CosIntegral[6*(a/b + ArcS
in[c*x])] + 2*Log[a + b*ArcSin[c*x]] - 4*Log[8*(a + b*ArcSin[c*x])] - Sin[(
2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] + 2*Sin[(4*a)/b]*SinIntegral[4*(
a/b + ArcSin[c*x])] + Sin[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])])/(b*c
^3)
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 157, normalized size of antiderivative = 0.76

method	result
default	$-\frac{2\,\text{Si}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)+2\,\text{Ci}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)-\text{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)-\text{Ci}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)+\text{Si}}{32c^3b}$

```
[In] int(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/32/c^3*(2*Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)+2*Ci(4*arcsin(c*x)+4*a/b)*c
os(4*a/b)-Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)-Ci(2*arcsin(c*x)+2*a/b)*cos(2*
a/b)+Si(6*arcsin(c*x)+6*a/b)*sin(6*a/b)+Ci(6*arcsin(c*x)+6*a/b)*cos(6*a/b)-
2*ln(a+b*arcsin(c*x)))/b
```

Fricas [F]

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x^2}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-(c^2*x^4 - x^2)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^2(-(cx-1)(cx+1))^{\frac{3}{2}}}{a+b\,\mathrm{asin}(cx)}\,dx$$

```
[In] integrate(x**2*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**2*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x^2}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(3/2)*x^2/(b*arcsin(c*x) + a), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 473 vs. $2(192) = 384$.

Time = 0.32 (sec) , antiderivative size = 473, normalized size of antiderivative = 2.30

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = -\frac{\cos\left(\frac{a}{b}\right)^6 \operatorname{Ci}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{bc^3} - \frac{\cos\left(\frac{a}{b}\right)^5 \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{bc^3} + \frac{3\cos\left(\frac{a}{b}\right)^4 \operatorname{Ci}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{2bc^3} - \frac{\cos\left(\frac{a}{b}\right)^4 \operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{2bc^3} + \frac{\cos\left(\frac{a}{b}\right)^3 \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{bc^3} - \frac{\cos\left(\frac{a}{b}\right)^3 \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{2bc^3} - \frac{9\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{16bc^3} + \frac{\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{2bc^3} + \frac{\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{16bc^3} - \frac{3\cos\left(\frac{a}{b}\right) \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{16bc^3} + \frac{\cos\left(\frac{a}{b}\right) \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{4bc^3} + \frac{\cos\left(\frac{a}{b}\right) \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{16bc^3} + \frac{\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{32bc^3} - \frac{\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{16bc^3} - \frac{\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{32bc^3} + \frac{\log(b\arcsin(cx)+a)}{16bc^3}$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^6*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) - cos(a/b)^5*sin(a/
b)*sin_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) + 3/2*cos(a/b)^4*cos_integra
l(6*a/b + 6*arcsin(c*x))/(b*c^3) - 1/2*cos(a/b)^4*cos_integral(4*a/b + 4*ar
csin(c*x))/(b*c^3) + cos(a/b)^3*sin(a/b)*sin_integral(6*a/b + 6*arcsin(c*x)
)/(b*c^3) - 1/2*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*
c^3) - 9/16*cos(a/b)^2*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) + 1/2*co
s(a/b)^2*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) + 1/16*cos(a/b)^2*cos_
integral(2*a/b + 2*arcsin(c*x))/(b*c^3) - 3/16*cos(a/b)*sin(a/b)*sin_integr
al(6*a/b + 6*arcsin(c*x))/(b*c^3) + 1/4*cos(a/b)*sin(a/b)*sin_integral(4*a/
b + 4*arcsin(c*x))/(b*c^3) + 1/16*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*
arcsin(c*x))/(b*c^3) + 1/32*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) - 1
/16*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) - 1/32*cos_integral(2*a/b +
 2*arcsin(c*x))/(b*c^3) + 1/16*log(b*arcsin(c*x) + a)/(b*c^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^2\,(1-c^2\,x^2)^{3/2}}{a+b\,\mathrm{asin}\,(c\,x)}\,dx$$

```
[In] int((x^2*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)),x)
[Out] int((x^2*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)), x)
```

3.327 $\int \frac{x(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 183

$$\int \frac{x(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = -\frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8bc^2} - \frac{3\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16bc^2} - \frac{\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{16bc^2} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^2} + \frac{3\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^2} + \frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^2}$$

```
[Out] 1/8*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^2+3/16*cos(3*a/b)*Si(3*(a+b*arcsin
(c*x))/b)/b/c^2+1/16*cos(5*a/b)*Si(5*(a+b*arcsin(c*x))/b)/b/c^2-1/8*Ci((a+b
*arcsin(c*x))/b)*sin(a/b)/b/c^2-3/16*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b
/c^2-1/16*Ci(5*(a+b*arcsin(c*x))/b)*sin(5*a/b)/b/c^2
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4809, 4491, 3384, 3380, 3383}

$$\int \frac{x(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = -\frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^2} - \frac{3\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^2} - \frac{\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^2} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^2} + \frac{3\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^2} + \frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^2}$$

```
[In] Int[(x*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/8*(CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b*c^2) - (3*CosIntegral
[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b*c^2) - (CosIntegral[(5*(a +
 b*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(16*b*c^2) + (Cos[a/b]*SinIntegral[(a + b
*ArcSin[c*x])/b])/(8*b*c^2) + (3*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[
c*x]))/b])/(16*b*c^2) + (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b
])/(16*b*c^2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{\text{Subst}\left(\int \frac{\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^2}$$

$$= -\frac{\text{Subst}\left(\int \left(\frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x}+\frac{3\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x}+\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right)\,dx,x,a+b\arcsin(cx)\right)}{bc^2}$$

$$= -\frac{\text{Subst}\left(\int \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16bc^2} - \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8bc^2} - \frac{3\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16bc^2}$$

$$= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8bc^2} + \frac{\left(3\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16bc^2} + \frac{\cos\left(\frac{5a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16bc^2} - \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8bc^2} - \frac{\left(3\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16bc^2} - \frac{\sin\left(\frac{5a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16bc^2}$$

$$= -\frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8bc^2} - \frac{3\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16bc^2} - \frac{\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{16bc^2} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^2} + \frac{3\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^2} + \frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^2}$$

Mathematica [A] (verified)

Time = 0.44 (sec) , antiderivative size = 136, normalized size of antiderivative = 0.74

$$\int \frac{x(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \frac{-2\,\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)-3\,\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{3a}{b}\right.}{}$$

```
[In] Integrate[(x*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-2*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 3*CosIntegral[3*(a/b + ArcSin
[c*x])]*Sin[(3*a)/b] - CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b] + 2*
Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 3*Cos[(3*a)/b]*SinIntegral[3*(a/b
 + ArcSin[c*x])] + Cos[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*b*c
^2)
```

Maple [A] (verified)

Time = 0.19 (sec) , antiderivative size = 139, normalized size of antiderivative = 0.76

method	result
default	$\frac{\text{Si}\left(5\arcsin(cx)+\frac{5a}{b}\right)\cos\left(\frac{5a}{b}\right)-\text{Ci}\left(5\arcsin(cx)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)+3\,\text{Si}\left(3\arcsin(cx)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)-3\,\text{Ci}\left(3\arcsin(cx)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)+2\,\text{Si}(a}{16c^2b}$

```
[In] int(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/16/c^2*(Si(5*arcsin(c*x)+5*a/b)*cos(5*a/b)-Ci(5*arcsin(c*x)+5*a/b)*sin(5*
a/b)+3*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-3*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a
/b)+2*Si(arcsin(c*x)+a/b)*cos(a/b)-2*Ci(arcsin(c*x)+a/b)*sin(a/b))/b
```

Fricas [F]

$$\int \frac{x(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^3 - x)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{x(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{x(-(cx-1)(cx+1))^{\frac{3}{2}}}{a+b\,\mathrm{asin}\,(cx)}\,dx$$

```
[In] integrate(x*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
[Out] Integral(x*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{x(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(3/2)*x/(b*arcsin(c*x) + a), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 360 vs. $2(171) = 342$.

Time = 0.33 (sec) , antiderivative size = 360, normalized size of antiderivative = 1.97

$$\begin{aligned}\int \frac{x(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx &= -\frac{\cos\left(\frac{a}{b}\right)^4 \operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2} \\ &+ \frac{\cos\left(\frac{a}{b}\right)^5 \operatorname{Si}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{bc^2} + \frac{3\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{4\,bc^2} \\ &- \frac{3\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{4\,bc^2} \\ &- \frac{5\cos\left(\frac{a}{b}\right)^3 \operatorname{Si}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{4\,bc^2} + \frac{3\cos\left(\frac{a}{b}\right)^3 \operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4\,bc^2} \\ &- \frac{\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{16\,bc^2} + \frac{3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{16\,bc^2} \\ &- \frac{\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{8\,bc^2} + \frac{5\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{16\,bc^2} \\ &- \frac{9\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{16\,bc^2} + \frac{\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{8\,bc^2}\end{aligned}$$

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2) + cos(a/b)
^5*sin_integral(5*a/b + 5*arcsin(c*x))/(b*c^2) + 3/4*cos(a/b)^2*cos_integra
l(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2) - 3/4*cos(a/b)^2*cos_integral(3*a
/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) - 5/4*cos(a/b)^3*sin_integral(5*a/b +
5*arcsin(c*x))/(b*c^2) + 3/4*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))
/(b*c^2) - 1/16*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2) + 3/16
*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) - 1/8*cos_integral(a/
b + arcsin(c*x))*sin(a/b)/(b*c^2) + 5/16*cos(a/b)*sin_integral(5*a/b + 5*ar
csin(c*x))/(b*c^2) - 9/16*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c
^2) + 1/8*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx=\int \frac{x\,{\left(1-c^2\,x^2\right)}^{3/2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((x*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)),x)
[Out] int((x*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)), x)
```

3.328 $\int \frac{(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 144

$$\int \frac{(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc} + \frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc} + \frac{3\log(a+b\arcsin(cx))}{8bc} + \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc} + \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc}$$

```
[Out] 1/2*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c+1/8*Ci(4*(a+b*arcsin(c*x))/b)*
cos(4*a/b)/b/c+3/8*ln(a+b*arcsin(c*x))/b/c+1/2*Si(2*(a+b*arcsin(c*x))/b)*si
n(2*a/b)/b/c+1/8*Si(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b/c
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4753, 3393, 3384, 3380, 3383}

$$\int \frac{(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc} + \frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc} + \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc} + \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc} + \frac{3\log(a+b\arcsin(cx))}{8bc}$$

```
[In] Int[(1 - c^2*x^2)^(3/2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(2*b*c) + (Cos[(4*a)/
b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b*c) + (3*Log[a + b*ArcSin[c*
x]])/(8*b*c) + (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(2*b*c
) + (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\text{integral} = \frac{\text{Subst}\left(\int \frac{\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{3}{8x}+\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8x}+\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\right)\,dx, x, a+b\arcsin(cx)\right)}{bc}$$

$$= \frac{3\log(a+b\arcsin(cx))}{8bc} + \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8bc} + \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc}$$

$$= \frac{3\log(a+b\arcsin(cx))}{8bc} + \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc} + \frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8bc} + \frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc} + \frac{\sin\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8bc}$$

$$= \frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc} + \frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc} + \frac{3\log(a+b\arcsin(cx))}{8bc} + \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc} + \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc}$$

Mathematica [A] (verified)

Time = 0.42 (sec) , antiderivative size = 121, normalized size of antiderivative = 0.84

$$\int \frac{(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \frac{4\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)+\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\arcsin(cx\right.\right.}{}$$

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (4*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + Cos[(4*a)/b]*CosIntegr
al[4*(a/b + ArcSin[c*x])] + 4*Log[a + b*ArcSin[c*x]] - Log[8*(a + b*ArcSin[
c*x])] + 4*Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] + Sin[(4*a)/b]*S
inIntegral[4*(a/b + ArcSin[c*x])])/(8*b*c)
```

Maple [A] (verified)

Time = 0.15 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.77

method	result
default	$\frac{\mathrm{Si}\left(4 \arcsin (c x)+\frac{4 a}{b}\right) \sin \left(\frac{4 a}{b}\right)+\mathrm{Ci}\left(4 \arcsin (c x)+\frac{4 a}{b}\right) \cos \left(\frac{4 a}{b}\right)+4 \,\mathrm{Si}\left(2 \arcsin (c x)+\frac{2 a}{b}\right) \sin \left(\frac{2 a}{b}\right)+4 \,\mathrm{Ci}\left(2 \arcsin (c x)+\frac{2 a}{b}\right) \cos \left(\frac{2 a}{b}\right)+3 \ln (a-}{8 c b}$

```
[In] int((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] 1/8/c*(Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)+Ci(4*arcsin(c*x)+4*a/b)*cos(4*a/b
)+4*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)+4*Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/b)
+3*ln(a+b*arcsin(c*x)))/b
```

Fricas [F]

$$\int \frac{(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-(cx-1)(cx+1))^{\frac{3}{2}}}{a+b\,\mathrm{asin}(cx)}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/(b*arcsin(c*x) + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 252, normalized size of antiderivative = 1.75

$$\int \frac{(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \frac{\cos\left(\frac{a}{b}\right)^4 \operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{bc} + \frac{\cos\left(\frac{a}{b}\right)^3 \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{bc} - \frac{\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{bc} + \frac{\cos\left(\frac{a}{b}\right)^2 \operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc} - \frac{\cos\left(\frac{a}{b}\right) \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{2bc} + \frac{\cos\left(\frac{a}{b}\right) \sin\left(\frac{a}{b}\right) \operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc} + \frac{\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{8bc} - \frac{\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc} + \frac{3\log(b\arcsin(cx)+a)}{8bc}$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c) + cos(a/b)^3*sin(a/b)*
sin_integral(4*a/b + 4*arcsin(c*x))/(b*c) - cos(a/b)^2*cos_integral(4*a/b +
 4*arcsin(c*x))/(b*c) + cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c
) - 1/2*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c) + cos(a
/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c) + 1/8*cos_integral(4
*a/b + 4*arcsin(c*x))/(b*c) - 1/2*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c)
 + 3/8*log(b*arcsin(c*x) + a)/(b*c)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(1-c^2\,x^2)^{3/2}}{a+b\,\mathrm{asin}(c\,x)}\,dx$$

```
[In] int((1 - c^2*x^2)^(3/2)/(a + b*asin(c*x)),x)
```

```
[Out] int((1 - c^2*x^2)^(3/2)/(a + b*asin(c*x)), x)
```

3.329 $\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))}\,dx = \frac{5\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4b} + \frac{\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4b} - \frac{5\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b} - \frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b} + \text{Int}\left(\frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))},x\right)$$

```
[Out] -5/4*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b-1/4*cos(3*a/b)*Si(3*(a+b*arcsin(c*x
))/b)/b+5/4*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b+1/4*Ci(3*(a+b*arcsin(c*x))/b
)*sin(3*a/b)/b+Unintegrable(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.44 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])),x]
```

```
[Out] (5*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(4*b) + (CosIntegral[(3*(a
+ b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b) - (5*Cos[a/b]*SinIntegral[(a + b*A
```

```
rcSin[c*x])/b])/(4*b) - (Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b
])/(4*b) + Defer[Int][1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}-\frac{2c^2x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}+\frac{c^4x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\right)dx\\
&= -\left(\left(2c^2\right)\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\right)+c^4\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx+\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= -\frac{\text{Subst}\left(\int \frac{\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b}+\frac{2\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b}+\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= -\frac{\text{Subst}\left(\int \left(-\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{3\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)dx,x,a+b\arcsin(cx)\right)}{b}-\frac{\left(2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b}\\
&\quad+\frac{\left(2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b}+\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= \frac{2\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b}-\frac{2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b}+\frac{\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{4b}\\
&\quad-\frac{3\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{4b}+\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx
\end{aligned}$$

$$
\begin{aligned}
&= \frac{2\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b} - \frac{2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b} \\
&+ \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b} \\
&- \frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b} \\
&- \frac{\left(3\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b} \\
&+ \frac{\sin\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b} \\
&+ \int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx \\
&= \frac{5\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4b} + \frac{\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4b} \\
&- \frac{5\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b} - \frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b} \\
&+ \int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx
\end{aligned}
$$

Mathematica [N/A]

Not integrable

Time = 3.35 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$
\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))}\,dx
$$

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.09 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{\left(-c^{2} x^{2}+1\right)^{\frac{3}{2}}}{x \left(a +b \arcsin \left(c x \right)\right)}d x$$

```
[In] int((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{\left(-c^{2} x^{2} + 1\right)^{\frac{3}{2}}}{{\left(b \arcsin\left(c x\right) + a\right)} x} \,d x$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*x*arcsin(c*x) + a*x), x)
```

Sympy [N/A]

Not integrable

Time = 2.15 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{\left(- \left(c x - 1\right) \left(c x + 1\right)\right)^{\frac{3}{2}}}{x \left(a + b \operatorname{asin}{\left(c x \right)}\right)}\, dx$$

```
[In] integrate((-c**2*x**2+1)**(3/2)/x/(a+b*asin(c*x)),x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin(cx)+a)x}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2\,x^2)^{3/2}}{x\,(a+b\,\mathrm{asin}\,(c\,x))}\,dx$$

```
[In] int((1 - c^2*x^2)^(3/2)/(x*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(3/2)/(x*(a + b*asin(c*x))), x)
```

3.330 $\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))}\,dx = -\frac{c\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2b} - \frac{3c\log(a+b\arcsin(cx))}{2b} - \frac{c\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2b} + \text{Int}\left(\frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))},x\right)$$

```
[Out] -1/2*c*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b-3/2*c*ln(a+b*arcsin(c*x))/b-1
/2*c*Si(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b+Unintegrable(1/x^2/(a+b*arcsin(
c*x))/(-c^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.35 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])),x]
```

```
[Out] -1/2*(c*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/b - (3*c*Log[a
 + b*ArcSin[c*x]])/(2*b) - (c*Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x
```

```
]))/b])/(2*b) + Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(-\frac{2c^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}+\frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}+\frac{c^4x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\right)dx\\
&= -\left((2c^2)\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\right)+c^4\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx+\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= -\frac{2c\log(a+b\arcsin(cx))}{b}+\frac{c\text{Subst}\left(\int \frac{\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b}+\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= -\frac{2c\log(a+b\arcsin(cx))}{b}+\frac{c\text{Subst}\left(\int \left(\frac{1}{2x}-\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\right)dx,x,a+b\arcsin(cx)\right)}{b}+\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= -\frac{3c\log(a+b\arcsin(cx))}{2b}-\frac{c\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b}+\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= -\frac{3c\log(a+b\arcsin(cx))}{2b}-\frac{\left(c\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b}-\frac{\left(c\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b}+\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= -\frac{c\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2b}-\frac{3c\log(a+b\arcsin(cx))}{2b}-\frac{c\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2b}+\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx
\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 2.28 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))}\,dx=\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.10 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{x^2\,(a+b\arcsin\,(cx))}dx$$

```
[In] int((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.14

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))}\,dx=\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin\,(cx)+a)x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*x^2*arcsin(c*x) + a*x^2), x)
```

Sympy [N/A]

Not integrable

Time = 1.77 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))}\,dx = \int \frac{(-(cx-1)(cx+1))^{\frac{3}{2}}}{x^2(a+b\,\mathrm{asin}\,(cx))}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**2/(a+b*asin(c*x)),x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**2*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin(cx)+a)x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^2), x)
```

Giac [N/A]

Not integrable

Time = 0.52 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin(cx)+a)x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))}\,dx=\int \frac{{\left(1-c^2\,x^2\right)}^{3/2}}{x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

```
[In] int((1 - c^2*x^2)^(3/2)/(x^2*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(3/2)/(x^2*(a + b*asin(c*x))), x)
```

3.331 $\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 4.96 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.37 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{x^3\left(a+b\arcsin\left(cx\right)\right)}dx$$

```
[In] int((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.14

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin\left(cx\right)+a)x^3}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*x^3*arcsin(c*x) + a*x^3), x)
```

Sympy [N/A]

Not integrable

Time = 1.98 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))}\,dx = \int \frac{(-(cx-1)\,(cx+1))^{\frac{3}{2}}}{x^3\,(a+b\,\text{asin}\,(cx))}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**3/(a+b*asin(c*x)),x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**3*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin\,(cx)+a)x^3}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^3), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))}\,dx=\int \frac{{\left(1-c^2\,x^2\right)}^{3/2}}{x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

```
[In] int((1 - c^2*x^2)^(3/2)/(x^3*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(3/2)/(x^3*(a + b*asin(c*x))), x)
```

3.332 $\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 1.27 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))}\,dx=\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.84 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{x^4\,(a+b\arcsin\,(cx))}dx$$

```
[In] int((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.14

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))}\,dx=\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin\,(cx)+a)x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b*x^4*arcsin(c*x) + a*x^4), x)
```

Sympy [N/A]

Not integrable

Time = 2.63 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{(-(cx-1)\,(cx+1))^{\frac{3}{2}}}{x^4\,(a+b\,\mathrm{asin}\,(cx))}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**4/(a+b*asin(c*x)),x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**4*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin\,(cx)+a)x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^4), x)
```

Giac [N/A]

Not integrable

Time = 1.58 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin\,(cx)+a)x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)*x^4), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2\,x^2)^{3/2}}{x^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

```
[In] int((1 - c^2*x^2)^(3/2)/(x^4*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(3/2)/(x^4*(a + b*asin(c*x))), x)
```

3.333 $\int \frac{x^3(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 245

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = -\frac{3\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{128bc^4} - \frac{\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{32bc^4} + \frac{3\,\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{7a}{b}\right)}{256bc^4} + \frac{\text{CosIntegral}\left(\frac{9(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{9a}{b}\right)}{256bc^4} + \frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{128bc^4} + \frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{32bc^4} - \frac{3\cos\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{256bc^4} - \frac{\cos\left(\frac{9a}{b}\right)\text{Si}\left(\frac{9(a+b\arcsin(cx))}{b}\right)}{256bc^4}$$

```
[Out] 3/128*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^4+1/32*cos(3*a/b)*Si(3*(a+b*arcs
in(c*x))/b)/b/c^4-3/256*cos(7*a/b)*Si(7*(a+b*arcsin(c*x))/b)/b/c^4-1/256*co
s(9*a/b)*Si(9*(a+b*arcsin(c*x))/b)/b/c^4-3/128*Ci((a+b*arcsin(c*x))/b)*sin(
a/b)/b/c^4-1/32*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b/c^4+3/256*Ci(7*(a+b*
arcsin(c*x))/b)*sin(7*a/b)/b/c^4+1/256*Ci(9*(a+b*arcsin(c*x))/b)*sin(9*a/b)
/b/c^4
```

Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4809, 4491, 3384, 3380, 3383}

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = -\frac{3\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{128bc^4} - \frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{32bc^4} + \frac{3\sin\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{256bc^4} + \frac{\sin\left(\frac{9a}{b}\right)\text{CosIntegral}\left(\frac{9(a+b\arcsin(cx))}{b}\right)}{256bc^4} + \frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{128bc^4} + \frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{32bc^4} - \frac{3\cos\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{256bc^4} - \frac{\cos\left(\frac{9a}{b}\right)\text{Si}\left(\frac{9(a+b\arcsin(cx))}{b}\right)}{256bc^4}$$

```
[In] Int[(x^3*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-3*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(128*b*c^4) - (CosIntegral
[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(32*b*c^4) + (3*CosIntegral[(7*(a
 + b*ArcSin[c*x]))/b]*Sin[(7*a)/b])/(256*b*c^4) + (CosIntegral[(9*(a + b*Ar
cSin[c*x]))/b]*Sin[(9*a)/b])/(256*b*c^4) + (3*Cos[a/b]*SinIntegral[(a + b*A
rcSin[c*x])/b])/(128*b*c^4) + (Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*
x]))/b])/(32*b*c^4) - (3*Cos[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b
])/(256*b*c^4) - (Cos[(9*a)/b]*SinIntegral[(9*(a + b*ArcSin[c*x]))/b])/(256
*b*c^4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
```

```
NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{\text{Subst}\left(\int \frac{\cos^6\left(\frac{a}{b}-\frac{x}{b}\right)\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^4}$$

$$= -\frac{\text{Subst}\left(\int \left(-\frac{\sin\left(\frac{9a}{b}-\frac{9x}{b}\right)}{256x}-\frac{3\sin\left(\frac{7a}{b}-\frac{7x}{b}\right)}{256x}+\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{32x}+\frac{3\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{128x}\right)dx, x, a+b\arcsin(cx)\right)}{bc^4}$$

$$= \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{9a}{b}-\frac{9x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{256bc^4}+\frac{3\text{Subst}\left(\int \frac{\sin\left(\frac{7a}{b}-\frac{7x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{256bc^4}$$
$$-\frac{3\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{128bc^4}-\frac{\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^4}$$

$$
\begin{aligned}
&= \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{128bc^4} \\
&+ \frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{32bc^4} \\
&- \frac{\left(3\cos\left(\frac{7a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{7x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{256bc^4} \\
&- \frac{\cos\left(\frac{9a}{b}\right)\text{Subst}\left(\int\frac{\sin\left(\frac{9x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{256bc^4} \\
&- \frac{\left(3\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{128bc^4} \\
&- \frac{\sin\left(\frac{3a}{b}\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{32bc^4} \\
&+ \frac{\left(3\sin\left(\frac{7a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{7x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{256bc^4} \\
&+ \frac{\sin\left(\frac{9a}{b}\right)\text{Subst}\left(\int\frac{\cos\left(\frac{9x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{256bc^4}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{3\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{128bc^4} - \frac{\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{32bc^4} \\
&+ \frac{3\,\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{7a}{b}\right)}{256bc^4} + \frac{\text{CosIntegral}\left(\frac{9(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{9a}{b}\right)}{256bc^4} \\
&+ \frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{128bc^4} + \frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{32bc^4} \\
&- \frac{3\cos\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{256bc^4} - \frac{\cos\left(\frac{9a}{b}\right)\text{Si}\left(\frac{9(a+b\arcsin(cx))}{b}\right)}{256bc^4}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.97 (sec) , antiderivative size = 180, normalized size of antiderivative = 0.73

$$
\int\frac{x^3(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \frac{-6\,\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right) - 8\,\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{3}{b}\right.}{}
$$

```
[In] Integrate[(x^3*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-6*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 8*CosIntegral[3*(a/b + ArcSin
[c*x])]*Sin[(3*a)/b] + 3*CosIntegral[7*(a/b + ArcSin[c*x])]*Sin[(7*a)/b] +
CosIntegral[9*(a/b + ArcSin[c*x])]*Sin[(9*a)/b] + 6*Cos[a/b]*SinIntegral[a/
```

```
b + ArcSin[c*x]] + 8*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] - 3*Co
s[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])] - Cos[(9*a)/b]*SinIntegral[9*
(a/b + ArcSin[c*x])])/(256*b*c^4)
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 185, normalized size of antiderivative = 0.76

method	result
default	$\frac{6\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-6\,\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+8\,\mathrm{Si}\left(3\arcsin(cx)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)-8\,\mathrm{Ci}\left(3\arcsin(cx)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)-3\,\mathrm{Si}(7\,\mathrm{arc}}{256c^4b}$

```
[In] int(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/256/c^4*(6*Si(arcsin(c*x)+a/b)*cos(a/b)-6*Ci(arcsin(c*x)+a/b)*sin(a/b)+8*
Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-8*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)-3*S
i(7*arcsin(c*x)+7*a/b)*cos(7*a/b)-Si(9*arcsin(c*x)+9*a/b)*cos(9*a/b)+Ci(9*a
rcsin(c*x)+9*a/b)*sin(9*a/b)+3*Ci(7*arcsin(c*x)+7*a/b)*sin(7*a/b))/b
```

Fricas [F]

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}x^3}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^7 - 2*c^2*x^5 + x^3)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a)
, x)
```

Sympy [F]

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^3(-(cx-1)(cx+1))^{\frac{5}{2}}}{a+b\,\mathrm{asin}(cx)}\,dx$$

```
[In] integrate(x**3*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**3*(-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}x^3}{b\arcsin(cx)+a}\,dx$$

[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")

[Out] integrate((-c^2*x^2 + 1)^(5/2)*x^3/(b*arcsin(c*x) + a), x)

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 746 vs. $2(229) = 458$.

Time = 0.35 (sec) , antiderivative size = 746, normalized size of antiderivative = 3.04

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \text{Too large to display}$$

[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")

[Out] cos(a/b)^8*cos_integral(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*c^4) - cos(a/b)^9*sin_integral(9*a/b + 9*arcsin(c*x))/(b*c^4) - 7/4*cos(a/b)^6*cos_integral(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*c^4) + 3/4*cos(a/b)^6*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) + 9/4*cos(a/b)^7*sin_integral(9*a/b + 9*arcsin(c*x))/(b*c^4) - 3/4*cos(a/b)^7*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^4) + 15/16*cos(a/b)^4*cos_integral(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*c^4) - 15/16*cos(a/b)^4*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) - 27/16*cos(a/b)^5*sin_integral(9*a/b + 9*arcsin(c*x))/(b*c^4) + 21/16*cos(a/b)^5*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^4) - 5/32*cos(a/b)^2*cos_integral(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*c^4) + 9/32*cos(a/b)^2*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) - 1/8*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^4) + 15/32*cos(a/b)^3*sin_integral(9*a/b + 9*arcsin(c*x))/(b*c^4) - 21/32*cos(a/b)^3*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^4) + 1/8*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^4) + 1/256*cos_integral(9*a/b + 9*arcsin(c*x))*sin(a/b)/(b*c^4) - 3/256*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^4) + 1/32*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^4) - 3/128*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b*c^4) - 9/256*cos(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b*c^4) + 21/256*cos(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^4) - 3/32*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^4) + 3/128*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^4)

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^3\,(1-c^2\,x^2)^{5/2}}{a+b\,\mathrm{asin}\,(c\,x)}\,dx$$

```
[In] int((x^3*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)),x)
[Out] int((x^3*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)), x)
```

3.334 $\int \frac{x^2(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 268

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \frac{\cos\left(\frac{2a}{b}\right)\operatorname{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\cos\left(\frac{4a}{b}\right)\operatorname{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\cos\left(\frac{6a}{b}\right)\operatorname{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\cos\left(\frac{8a}{b}\right)\operatorname{CosIntegral}\left(\frac{8(a+b\arcsin(cx))}{b}\right)}{128bc^3} + \frac{5\log(a+b\arcsin(cx))}{128bc^3} + \frac{\sin\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\sin\left(\frac{4a}{b}\right)\operatorname{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\sin\left(\frac{6a}{b}\right)\operatorname{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\sin\left(\frac{8a}{b}\right)\operatorname{Si}\left(\frac{8(a+b\arcsin(cx))}{b}\right)}{128bc^3}$$

```
[Out] 1/32*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c^3-1/32*Ci(4*(a+b*arcsin(c*x))
/b)*cos(4*a/b)/b/c^3-1/32*Ci(6*(a+b*arcsin(c*x))/b)*cos(6*a/b)/b/c^3-1/128*
Ci(8*(a+b*arcsin(c*x))/b)*cos(8*a/b)/b/c^3+5/128*ln(a+b*arcsin(c*x))/b/c^3+
1/32*Si(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b/c^3-1/32*Si(4*(a+b*arcsin(c*x))
/b)*sin(4*a/b)/b/c^3-1/32*Si(6*(a+b*arcsin(c*x))/b)*sin(6*a/b)/b/c^3-1/128*
Si(8*(a+b*arcsin(c*x))/b)*sin(8*a/b)/b/c^3
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4809, 4491, 3384, 3380, 3383}

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\cos\left(\frac{8a}{b}\right)\text{CosIntegral}\left(\frac{8(a+b\arcsin(cx))}{b}\right)}{128bc^3} + \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\sin\left(\frac{8a}{b}\right)\text{Si}\left(\frac{8(a+b\arcsin(cx))}{b}\right)}{128bc^3} + \frac{5\log(a+b\arcsin(cx))}{128bc^3}$$

```
[In] Int[(x^2*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Cos[(4*
a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Cos[(6*a)/b]*Co
sIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Cos[(8*a)/b]*CosIntegra
l[(8*(a + b*ArcSin[c*x]))/b])/(128*b*c^3) + (5*Log[a + b*ArcSin[c*x]])/(128
*b*c^3) + (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c^3)
- (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Sin[(
6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c^3) - (Sin[(8*a)/b]*
SinIntegral[(8*(a + b*ArcSin[c*x]))/b])/(128*b*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
```

```
NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\cos^6\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{bc^3}\\
&= \frac{\text{Subst}\left(\int \left(\frac{5}{128x}-\frac{\cos\left(\frac{8a}{b}-\frac{8x}{b}\right)}{128x}-\frac{\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)}{32x}-\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{32x}+\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{32x}\right)\,dx,x,a+b\arcsin(cx)\right)}{bc^3}\\
&= \frac{5\log(a+b\arcsin(cx))}{128bc^3}-\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{8a}{b}-\frac{8x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{128bc^3}\\
&\quad -\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{32bc^3}\\
&\quad -\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{32bc^3}\\
&\quad +\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{32bc^3}
\end{aligned}$$

$$= \frac{5\log(a+b\arcsin(cx))}{128bc^3} + \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^3} - \frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^3} - \frac{\cos\left(\frac{6a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^3} - \frac{\cos\left(\frac{8a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{8x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{128bc^3} + \frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^3} - \frac{\sin\left(\frac{6a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc^3} - \frac{\sin\left(\frac{8a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{8x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{128bc^3}$$

$$= \frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\cos\left(\frac{8a}{b}\right)\text{CosIntegral}\left(\frac{8(a+b\arcsin(cx))}{b}\right)}{128bc^3} + \frac{5\log(a+b\arcsin(cx))}{128bc^3} + \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc^3} - \frac{\sin\left(\frac{8a}{b}\right)\text{Si}\left(\frac{8(a+b\arcsin(cx))}{b}\right)}{128bc^3}$$

Mathematica [A] (verified)

Time = 0.87 (sec) , antiderivative size = 209, normalized size of antiderivative = 0.78

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = -\frac{-4\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)+4\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\arcsin(cx)\right)\right)+4\cos\left(\frac{6a}{b}\right)\text{CosI}}{}$$

```
[In] Integrate[(x^2*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/128*(-4*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + 4*Cos[(4*a)/b]
*CosIntegral[4*(a/b + ArcSin[c*x])] + 4*Cos[(6*a)/b]*CosIntegral[6*(a/b + A
```

```
rcSin[c*x])] + Cos[(8*a)/b]*CosIntegral[8*(a/b + ArcSin[c*x])] + 11*Log[a +
 b*ArcSin[c*x]] - 16*Log[8*(a + b*ArcSin[c*x])] - 4*Sin[(2*a)/b]*SinIntegra
l[2*(a/b + ArcSin[c*x])] + 4*Sin[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])
] + 4*Sin[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])] + Sin[(8*a)/b]*SinInt
egral[8*(a/b + ArcSin[c*x])])/(b*c^3)
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 203, normalized size of antiderivative = 0.76

method	result
default	$-\frac{4\ \mathrm{Si}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)+4\ \mathrm{Ci}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)-4\ \mathrm{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)+\mathrm{Si}\left(8\arcsin(cx)+\frac{8a}{b}\right)\sin\left(\frac{8a}{b}\right)+}{}$

```
[In] int(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/128/c^3*(4*Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)+4*Ci(4*arcsin(c*x)+4*a/b)*
cos(4*a/b)-4*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)+Si(8*arcsin(c*x)+8*a/b)*sin
(8*a/b)+Ci(8*arcsin(c*x)+8*a/b)*cos(8*a/b)-4*Ci(2*arcsin(c*x)+2*a/b)*cos(2*
a/b)+4*Si(6*arcsin(c*x)+6*a/b)*sin(6*a/b)+4*Ci(6*arcsin(c*x)+6*a/b)*cos(6*a
/b)-5*ln(a+b*arcsin(c*x)))/b
```

Fricas [F]

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}x^2}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^6 - 2*c^2*x^4 + x^2)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a)
, x)
```

Sympy [F]

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^2(-(cx-1)(cx+1))^{\frac{5}{2}}}{a+b\,\mathrm{asin}(cx)}\,dx$$

```
[In] integrate(x**2*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x**2*(-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}x^2}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(5/2)*x^2/(b*arcsin(c*x) + a), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 757 vs. 2(250) = 500.

Time = 0.34 (sec) , antiderivative size = 757, normalized size of antiderivative = 2.82

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \text{Too large to display}$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] -cos(a/b)^8*cos_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) - cos(a/b)^7*sin(a/
b)*sin_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) + 2*cos(a/b)^6*cos_integral(
8*a/b + 8*arcsin(c*x))/(b*c^3) - cos(a/b)^6*cos_integral(6*a/b + 6*arcsin(c
*x))/(b*c^3) + 3/2*cos(a/b)^5*sin(a/b)*sin_integral(8*a/b + 8*arcsin(c*x))/
(b*c^3) - cos(a/b)^5*sin(a/b)*sin_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) -
 5/4*cos(a/b)^4*cos_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) + 3/2*cos(a/b)^
4*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) - 1/4*cos(a/b)^4*cos_integral
(4*a/b + 4*arcsin(c*x))/(b*c^3) - 5/8*cos(a/b)^3*sin(a/b)*sin_integral(8*a/
b + 8*arcsin(c*x))/(b*c^3) + cos(a/b)^3*sin(a/b)*sin_integral(6*a/b + 6*arc
sin(c*x))/(b*c^3) - 1/4*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c
*x))/(b*c^3) + 1/4*cos(a/b)^2*cos_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) -
 9/16*cos(a/b)^2*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c^3) + 1/4*cos(a/b)
^2*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^3) + 1/16*cos(a/b)^2*cos_integr
al(2*a/b + 2*arcsin(c*x))/(b*c^3) + 1/16*cos(a/b)*sin(a/b)*sin_integral(8*a
/b + 8*arcsin(c*x))/(b*c^3) - 3/16*cos(a/b)*sin(a/b)*sin_integral(6*a/b + 6
*arcsin(c*x))/(b*c^3) + 1/8*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin
(c*x))/(b*c^3) + 1/16*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))
/(b*c^3) - 1/128*cos_integral(8*a/b + 8*arcsin(c*x))/(b*c^3) + 1/32*cos_int
egral(6*a/b + 6*arcsin(c*x))/(b*c^3) - 1/32*cos_integral(4*a/b + 4*arcsin(c
*x))/(b*c^3) - 1/32*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c^3) + 5/128*log
(b*arcsin(c*x) + a)/(b*c^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx=\int \frac{x^2\,{\left(1-c^2\,x^2\right)}^{5/2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((x^2*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)),x)
[Out] int((x^2*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)), x)
```

3.335 $\int \frac{x(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 245

$$\int \frac{x(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = -\frac{5\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{64bc^2} - \frac{9\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{64bc^2} - \frac{5\,\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{64bc^2} - \frac{\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{7a}{b}\right)}{64bc^2} + \frac{5\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64bc^2} + \frac{9\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64bc^2} + \frac{5\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64bc^2} + \frac{\cos\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64bc^2}$$

```
[Out] 5/64*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^2+9/64*cos(3*a/b)*Si(3*(a+b*arcsi
n(c*x))/b)/b/c^2+5/64*cos(5*a/b)*Si(5*(a+b*arcsin(c*x))/b)/b/c^2+1/64*cos(7
*a/b)*Si(7*(a+b*arcsin(c*x))/b)/b/c^2-5/64*Ci((a+b*arcsin(c*x))/b)*sin(a/b)
/b/c^2-9/64*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b/c^2-5/64*Ci(5*(a+b*arcsi
n(c*x))/b)*sin(5*a/b)/b/c^2-1/64*Ci(7*(a+b*arcsin(c*x))/b)*sin(7*a/b)/b/c^2
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4809, 4491, 3384, 3380, 3383}

$$\int \frac{x(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = -\frac{5\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64bc^2} - \frac{9\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64bc^2} - \frac{5\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64bc^2} - \frac{\sin\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64bc^2} + \frac{5\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64bc^2} + \frac{9\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64bc^2} + \frac{5\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64bc^2} + \frac{\cos\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64bc^2}$$

```
[In] Int[(x*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-5*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(64*b*c^2) - (9*CosIntegra
l[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(64*b*c^2) - (5*CosIntegral[(5*(
a + b*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(64*b*c^2) - (CosIntegral[(7*(a + b*Ar
cSin[c*x]))/b]*Sin[(7*a)/b])/(64*b*c^2) + (5*Cos[a/b]*SinIntegral[(a + b*Ar
cSin[c*x])/b])/(64*b*c^2) + (9*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*
x]))/b])/(64*b*c^2) + (5*Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b
])/(64*b*c^2) + (Cos[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/(64*b
*c^2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
```

```
NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{\text{Subst}\left(\int \frac{\cos^6\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^2}$$

$$= -\frac{\text{Subst}\left(\int \left(\frac{\sin\left(\frac{7a}{b}-\frac{7x}{b}\right)}{64x}+\frac{5\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{64x}+\frac{9\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{64x}+\frac{5\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{64x}\right)dx, x, a+b\arcsin(cx)\right)}{bc^2}$$

$$= -\frac{\text{Subst}\left(\int \frac{\sin\left(\frac{7a}{b}-\frac{7x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64bc^2} - \frac{5\text{Subst}\left(\int \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64bc^2} - \frac{5\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64bc^2} - \frac{9\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64bc^2}$$

$$= \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^2} + \frac{\left(9\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^2} + \frac{\left(5\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^2} + \frac{\cos\left(\frac{7a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{7x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^2} - \frac{\left(5\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^2} - \frac{\left(9\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^2} - \frac{\left(5\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^2} - \frac{\sin\left(\frac{7a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{7x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64bc^2}$$

$$= -\frac{5\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{64bc^2} - \frac{9\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{64bc^2} - \frac{5\,\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{64bc^2} - \frac{\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{7a}{b}\right)}{64bc^2} + \frac{5\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64bc^2} + \frac{9\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64bc^2} + \frac{5\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64bc^2} + \frac{\cos\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64bc^2}$$

Mathematica [A] (verified)

Time = 0.79 (sec) , antiderivative size = 180, normalized size of antiderivative = 0.73

$$\int \frac{x(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \frac{-5\,\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right) - 9\,\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{3}{b}\right.}{}$$

```
[In] Integrate[(x*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] (-5*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 9*CosIntegral[3*(a/b + ArcSin
[c*x])]*Sin[(3*a)/b] - 5*CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b] -
CosIntegral[7*(a/b + ArcSin[c*x])]*Sin[(7*a)/b] + 5*Cos[a/b]*SinIntegral[a/
```

```
b + ArcSin[c*x]] + 9*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 5*Co
s[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])] + Cos[(7*a)/b]*SinIntegral[7*
(a/b + ArcSin[c*x])])/(64*b*c^2)
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 185, normalized size of antiderivative = 0.76

method	result
default	$\frac{\mathrm{Si}\left(7 \arcsin(cx)+\frac{7a}{b}\right) \cos\left(\frac{7a}{b}\right)-\mathrm{Ci}\left(7 \arcsin(cx)+\frac{7a}{b}\right) \sin\left(\frac{7a}{b}\right)+5\ \mathrm{Si}\left(5 \arcsin(cx)+\frac{5a}{b}\right) \cos\left(\frac{5a}{b}\right)-5\ \mathrm{Ci}\left(5 \arcsin(cx)+\frac{5a}{b}\right) \sin\left(\frac{5a}{b}\right)+9\ \mathrm{Si}(3}{64c^2 b}$

```
[In] int(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/64/c^2*(Si(7*arcsin(c*x)+7*a/b)*cos(7*a/b)-Ci(7*arcsin(c*x)+7*a/b)*sin(7*
a/b)+5*Si(5*arcsin(c*x)+5*a/b)*cos(5*a/b)-5*Ci(5*arcsin(c*x)+5*a/b)*sin(5*a
/b)+9*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-9*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/
b)+5*Si(arcsin(c*x)+a/b)*cos(a/b)-5*Ci(arcsin(c*x)+a/b)*sin(a/b))/b
```

Fricas [F]

$$\int \frac{x(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}x}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^5 - 2*c^2*x^3 + x)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a),
x)
```

Sympy [F]

$$\int \frac{x(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{x(-(cx-1)(cx+1))^{\frac{5}{2}}}{a+b\,\mathrm{asin}(cx)}\,dx$$

```
[In] integrate(x*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral(x*(-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{x(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}x}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(5/2)*x/(b*arcsin(c*x) + a), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 614 vs. $2(229) = 458$.

Time = 0.33 (sec) , antiderivative size = 614, normalized size of antiderivative = 2.51

$$\begin{aligned}
\int \frac{x(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx &= -\frac{\cos\left(\frac{a}{b}\right)^6\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2} \\
&+ \frac{\cos\left(\frac{a}{b}\right)^7\operatorname{Si}\left(\frac{7a}{b}+7\arcsin(cx)\right)}{bc^2} + \frac{5\cos\left(\frac{a}{b}\right)^4\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{4bc^2} \\
&- \frac{5\cos\left(\frac{a}{b}\right)^4\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{4bc^2} \\
&- \frac{7\cos\left(\frac{a}{b}\right)^5\operatorname{Si}\left(\frac{7a}{b}+7\arcsin(cx)\right)}{4bc^2} + \frac{5\cos\left(\frac{a}{b}\right)^5\operatorname{Si}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{4bc^2} \\
&- \frac{3\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{8bc^2} \\
&+ \frac{15\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{16bc^2} \\
&- \frac{9\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{16bc^2} \\
&+ \frac{7\cos\left(\frac{a}{b}\right)^3\operatorname{Si}\left(\frac{7a}{b}+7\arcsin(cx)\right)}{8bc^2} - \frac{25\cos\left(\frac{a}{b}\right)^3\operatorname{Si}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{16bc^2} \\
&+ \frac{9\cos\left(\frac{a}{b}\right)^3\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{16bc^2} + \frac{\operatorname{Ci}\left(\frac{7a}{b}+7\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{64bc^2} \\
&- \frac{5\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{64bc^2} + \frac{9\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{64bc^2} \\
&- \frac{5\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{64bc^2} - \frac{7\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{7a}{b}+7\arcsin(cx)\right)}{64bc^2} \\
&+ \frac{25\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{64bc^2} \\
&- \frac{27\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{64bc^2} + \frac{5\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{64bc^2}
\end{aligned}$$

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -cos(a/b)^6*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^2) + cos(a/b)
^7*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^2) + 5/4*cos(a/b)^4*cos_integra
l(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c^2) - 5/4*cos(a/b)^4*cos_integral(5*a
/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2) - 7/4*cos(a/b)^5*sin_integral(7*a/b +
7*arcsin(c*x))/(b*c^2) + 5/4*cos(a/b)^5*sin_integral(5*a/b + 5*arcsin(c*x))
/(b*c^2) - 3/8*cos(a/b)^2*cos_integral(7*a/b + 7*arcsin(c*x))*sin(a/b)/(b*c
^2) + 15/16*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^2)
 - 9/16*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) + 7
/8*cos(a/b)^3*sin_integral(7*a/b + 7*arcsin(c*x))/(b*c^2) - 25/16*cos(a/b)^
3*sin_integral(5*a/b + 5*arcsin(c*x))/(b*c^2) + 9/16*cos(a/b)^3*sin_integra
l(3*a/b + 3*arcsin(c*x))/(b*c^2) + 1/64*cos_integral(7*a/b + 7*arcsin(c*x))
*sin(a/b)/(b*c^2) - 5/64*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b*c^
2) + 9/64*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b*c^2) - 5/64*cos_i
ntegral(a/b + arcsin(c*x))*sin(a/b)/(b*c^2) - 7/64*cos(a/b)*sin_integral(7*
a/b + 7*arcsin(c*x))/(b*c^2) + 25/64*cos(a/b)*sin_integral(5*a/b + 5*arcsin
(c*x))/(b*c^2) - 27/64*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b*c^2)
 + 5/64*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx=\int \frac{x\,{\left(1-c^2\,x^2\right)}^{5/2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((x*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)),x)
```

```
[Out] int((x*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)), x)
```

3.336 $\int \frac{(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 206

$$\int \frac{(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \frac{15\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc} + \frac{3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc} + \frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc} + \frac{5\log(a+b\arcsin(cx))}{16bc} + \frac{15\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc} + \frac{3\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc} + \frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc}$$

```
[Out] 15/32*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c+3/16*Ci(4*(a+b*arcsin(c*x))/
b)*cos(4*a/b)/b/c+1/32*Ci(6*(a+b*arcsin(c*x))/b)*cos(6*a/b)/b/c+5/16*ln(a+b
*arcsin(c*x))/b/c+15/32*Si(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b/c+3/16*Si(4*
(a+b*arcsin(c*x))/b)*sin(4*a/b)/b/c+1/32*Si(6*(a+b*arcsin(c*x))/b)*sin(6*a/
b)/b/c
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4753, 3393, 3384, 3380, 3383}

$$\int \frac{(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \frac{15\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc} + \frac{3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc} + \frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc} + \frac{15\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc} + \frac{3\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc} + \frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc} + \frac{5\log(a+b\arcsin(cx))}{16bc}$$

```
[In] Int[(1 - c^2*x^2)^(5/2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (15*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b*c) + (3*Cos[
(4*a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c) + (Cos[(6*a)/b]*C
osIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c) + (5*Log[a + b*ArcSin[c*x]]
)/(16*b*c) + (15*Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(32*b
*c) + (3*Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(16*b*c) + (S
in[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(32*b*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\cos^6\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc}\\
&= \frac{\text{Subst}\left(\int \left(\frac{5}{16x}+\frac{\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)}{32x}+\frac{3\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{16x}+\frac{15\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{32x}\right)dx, x, a+b\arcsin(cx)\right)}{bc}\\
&= \frac{5\log(a+b\arcsin(cx))}{16bc}+\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc}\\
&\quad+\frac{3\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc}\\
&\quad+\frac{15\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc}\\
&= \frac{5\log(a+b\arcsin(cx))}{16bc}+\frac{\left(15\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc}\\
&\quad+\frac{\left(3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc}\\
&\quad+\frac{\cos\left(\frac{6a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc}\\
&\quad+\frac{\left(15\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc}\\
&\quad+\frac{\left(3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc}\\
&\quad+\frac{\sin\left(\frac{6a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{32bc}
\end{aligned}$$

$$= \frac{15\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc} + \frac{3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc}$$
$$+ \frac{\cos\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc}$$
$$+ \frac{5\log(a+b\arcsin(cx))}{16bc} + \frac{15\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{32bc}$$
$$+ \frac{3\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{16bc} + \frac{\sin\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{32bc}$$

Mathematica [A] (verified)

Time = 0.66 (sec) , antiderivative size = 165, normalized size of antiderivative = 0.80

$$\int \frac{(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \frac{15\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)+6\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\arcsin(c\right.\right.}{}$$

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (15*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + 6*Cos[(4*a)/b]*CosInt
egral[4*(a/b + ArcSin[c*x])] + Cos[(6*a)/b]*CosIntegral[6*(a/b + ArcSin[c*x
])] + 18*Log[a + b*ArcSin[c*x]] - 8*Log[8*(a + b*ArcSin[c*x])] + 15*Sin[(2*
a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] + 6*Sin[(4*a)/b]*SinIntegral[4*(a/
b + ArcSin[c*x])] + Sin[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])])/(32*b*
c)
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 157, normalized size of antiderivative = 0.76

method	result
default	$\frac{\text{Si}\left(6\arcsin(cx)+\frac{6a}{b}\right)\sin\left(\frac{6a}{b}\right)+\text{Ci}\left(6\arcsin(cx)+\frac{6a}{b}\right)\cos\left(\frac{6a}{b}\right)+6\,\text{Si}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)+6\,\text{Ci}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)+15\,\text{Si}(}{32cb}$

```
[In] int((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/c*(Si(6*arcsin(c*x)+6*a/b)*sin(6*a/b)+Ci(6*arcsin(c*x)+6*a/b)*cos(6*a/
b)+6*Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)+6*Ci(4*arcsin(c*x)+4*a/b)*cos(4*a/b
)+15*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)+15*Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/
b)+10*ln(a+b*arcsin(c*x)))/b
```

Fricas [F]

$$\int \frac{(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*arcsin(c*x) + a),
x)
```

Sympy [F]

$$\int \frac{(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-(cx-1)(cx+1))^{\frac{5}{2}}}{a+b\,\mathrm{asin}(cx)}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((-c^2*x^2 + 1)^(5/2)/(b*arcsin(c*x) + a), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 472 vs. $2(192) = 384$.

Time = 0.34 (sec) , antiderivative size = 472, normalized size of antiderivative = 2.29

$$\int \frac{(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \frac{\cos\left(\frac{a}{b}\right)^6 \operatorname{Ci}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{bc} + \frac{\cos\left(\frac{a}{b}\right)^5\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{bc} - \frac{3\cos\left(\frac{a}{b}\right)^4\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{2bc} + \frac{3\cos\left(\frac{a}{b}\right)^4\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{2bc} - \frac{\cos\left(\frac{a}{b}\right)^3\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{bc} + \frac{3\cos\left(\frac{a}{b}\right)^3\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{2bc} + \frac{9\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{16bc} - \frac{3\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{2bc} + \frac{15\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{16bc} + \frac{3\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{16bc} - \frac{3\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{4bc} + \frac{15\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{16bc} - \frac{\operatorname{Ci}\left(\frac{6a}{b}+6\arcsin(cx)\right)}{32bc} + \frac{3\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{16bc} - \frac{15\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{32bc} + \frac{5\log\left(b\arcsin(cx)+a\right)}{16bc}$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] cos(a/b)^6*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c) + cos(a/b)^5*sin(a/b)*
sin_integral(6*a/b + 6*arcsin(c*x))/(b*c) - 3/2*cos(a/b)^4*cos_integral(6*a
/b + 6*arcsin(c*x))/(b*c) + 3/2*cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(c*
x))/(b*c) - cos(a/b)^3*sin(a/b)*sin_integral(6*a/b + 6*arcsin(c*x))/(b*c) +
 3/2*cos(a/b)^3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c) + 9/16*c
os(a/b)^2*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c) - 3/2*cos(a/b)^2*cos_in
tegral(4*a/b + 4*arcsin(c*x))/(b*c) + 15/16*cos(a/b)^2*cos_integral(2*a/b +
 2*arcsin(c*x))/(b*c) + 3/16*cos(a/b)*sin(a/b)*sin_integral(6*a/b + 6*arcsi
n(c*x))/(b*c) - 3/4*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(
b*c) + 15/16*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c) -
1/32*cos_integral(6*a/b + 6*arcsin(c*x))/(b*c) + 3/16*cos_integral(4*a/b +
4*arcsin(c*x))/(b*c) - 15/32*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c) + 5/
16*log(b*arcsin(c*x) + a)/(b*c)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(1-c^2\,x^2)^{5/2}}{a+b\,\mathrm{asin}\,(c\,x)}\,dx$$

```
[In] int((1 - c^2*x^2)^(5/2)/(a + b*asin(c*x)),x)
[Out] int((1 - c^2*x^2)^(5/2)/(a + b*asin(c*x)), x)
```

3.337 $\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\begin{aligned}\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))}\,dx &= \frac{11\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8b} \\ &+ \frac{7\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16b} + \frac{\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{16b} \\ &- \frac{11\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b} - \frac{7\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b} \\ &- \frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b} + \text{Int}\left(\frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))},x\right)\end{aligned}$$

```
[Out] -11/8*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b-7/16*cos(3*a/b)*Si(3*(a+b*arcsin(c
*x))/b)/b-1/16*cos(5*a/b)*Si(5*(a+b*arcsin(c*x))/b)/b+11/8*Ci((a+b*arcsin(c
*x))/b)*sin(a/b)/b+7/16*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b+1/16*Ci(5*(a
+b*arcsin(c*x))/b)*sin(5*a/b)/b+Unintegrable(1/x/(a+b*arcsin(c*x))/(-c^2*x^
2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.69 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])),x]
```

```
[Out] (11*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(8*b) + (7*CosIntegral[(3*
(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b) + (CosIntegral[(5*(a + b*ArcSi
n[c*x]))/b]*Sin[(5*a)/b])/(16*b) - (11*Cos[a/b]*SinIntegral[(a + b*ArcSin[c
*x])/b])/(8*b) - (7*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(1
6*b) - (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b) + Defer
[Int][1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}-\frac{3c^2x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}+\frac{3c^4x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}-\frac{c^6x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\right)dx\\
&= -\left((3c^2)\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\right)+(3c^4)\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&\quad -c^6\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx+\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= \frac{\text{Subst}\left(\int \frac{\sin^5\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b}+\frac{3\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b}\\
&\quad -\frac{3\text{Subst}\left(\int \frac{\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b}+\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx
\end{aligned}$$

$$=\frac{\text{Subst}\left(\int\left(\frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x}-\frac{5\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x}+\frac{5\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right)dx,x,a+b\arcsin(cx)\right)}{b}$$
$$-\frac{3\text{Subst}\left(\int\left(-\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{3\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)dx,x,a+b\arcsin(cx)\right)}{b}$$
$$-\frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{b}$$
$$+\frac{\left(3\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{b}$$
$$+\int\frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}dx$$

$$=\frac{3\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b}-\frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b}$$
$$+\frac{\text{Subst}\left(\int\frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{16b}$$
$$-\frac{5\text{Subst}\left(\int\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{16b}$$
$$+\frac{5\text{Subst}\left(\int\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{8b}$$
$$+\frac{3\text{Subst}\left(\int\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{4b}$$
$$-\frac{9\text{Subst}\left(\int\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{4b}+\int\frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}dx$$

$$= \frac{3\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b} - \frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b}$$
$$- \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b}$$
$$+ \frac{\left(9\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b}$$
$$+ \frac{\left(5\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b}$$
$$- \frac{\left(3\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b}$$
$$- \frac{\cos\left(\frac{5a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b}$$
$$+ \frac{\left(5\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b}$$
$$- \frac{\left(9\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b}$$
$$- \frac{\left(5\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b}$$
$$+ \frac{\left(3\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b}$$
$$+ \frac{\sin\left(\frac{5a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b}$$
$$+ \int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

$$= \frac{11\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8b} + \frac{7\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16b}$$
$$+ \frac{\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{16b}$$
$$- \frac{11\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b} - \frac{7\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b}$$
$$- \frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b} + \int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 3.22 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.09 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x\,(a+b\arcsin\,(cx))}dx$$

```
[In] int((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.61

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin\,(cx)+a)x}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*x*arcsin(c*x) + a*
x), x)
```

Sympy [N/A]

Not integrable

Time = 5.21 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{(-(cx-1)(cx+1))^{\frac{5}{2}}}{x(a+b\operatorname{asin}(cx))}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(5/2)/x/(a+b*asin(c*x)),x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.50 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin(cx)+a)x}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2\,x^2)^{5/2}}{x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

```
[In] int((1 - c^2*x^2)^(5/2)/(x*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(5/2)/(x*(a + b*asin(c*x))), x)
```

3.338 $\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))}\,dx = -\frac{c\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b} - \frac{c\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8b} - \frac{15c\log(a+b\arcsin(cx))}{8b} - \frac{c\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b} - \frac{c\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8b} + \text{Int}\left(\frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))},x\right)$$

```
[Out] -c*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b-1/8*c*Ci(4*(a+b*arcsin(c*x))/b)*c
os(4*a/b)/b-15/8*c*ln(a+b*arcsin(c*x))/b-c*Si(2*(a+b*arcsin(c*x))/b)*sin(2*
a/b)/b-1/8*c*Si(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b+Unintegrable(1/x^2/(a+b
*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.54 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])),x]
```

```
[Out] -((c*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/b) - (c*Cos[(4*a)
/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b) - (15*c*Log[a + b*ArcSin[
c*x]])/(8*b) - (c*Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/b -
(c*Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b) + Defer[Int][
1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(-\frac{3c^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}+\frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}+\frac{3c^4x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}-\frac{c^6x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\right)dx\\
&= -\left((3c^2)\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\right)+(3c^4)\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&\quad -c^6\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx+\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= -\frac{3c\log(a+b\arcsin(cx))}{b}-\frac{c\text{Subst}\left(\int \frac{\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b}\\
&\quad +\frac{(3c)\text{Subst}\left(\int \frac{\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b}\\
&\quad +\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= -\frac{3c\log(a+b\arcsin(cx))}{b}\\
&\quad -\frac{c\text{Subst}\left(\int \left(\frac{3}{8x}+\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8x}-\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\right)dx,x,a+b\arcsin(cx)\right)}{b}\\
&\quad +\frac{(3c)\text{Subst}\left(\int \left(\frac{1}{2x}-\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\right)dx,x,a+b\arcsin(cx)\right)}{b}\\
&\quad +\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= -\frac{15c\log(a+b\arcsin(cx))}{8b}-\frac{c\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8b}\\
&\quad +\frac{c\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b}\\
&\quad -\frac{(3c)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b}\\
&\quad +\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{15c\log(a+b\arcsin(cx))}{8b}+\frac{\left(c\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b}\\
&\quad-\frac{\left(3c\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b}\\
&\quad-\frac{\left(c\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8b}\\
&\quad+\frac{\left(c\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b}\\
&\quad-\frac{\left(3c\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b}\\
&\quad-\frac{\left(c\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8b}\\
&\quad+\int\frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx\\
&= -\frac{c\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b}-\frac{c\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8b}\\
&\quad-\frac{15c\log(a+b\arcsin(cx))}{8b}-\frac{c\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b}\\
&\quad-\frac{c\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8b}+\int\frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx
\end{aligned}
$$

Mathematica [N/A]

Not integrable

Time = 2.15 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$
\int\frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))}\,dx=\int\frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))}\,dx
$$

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.10 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x^2\,(a+b\arcsin\,(cx))}dx$$

```
[In] int((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.75

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin\,(cx)+a)x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*x^2*arcsin(c*x) +
a*x^2), x)
```

Sympy [N/A]

Not integrable

Time = 3.87 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))}\,dx = \int \frac{(-(cx-1)\,(cx+1))^{\frac{5}{2}}}{x^2\,(a+b\,\mathrm{asin}\,(cx))}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**2/(a+b*asin(c*x)),x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x**2*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.50 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin(cx)+a)x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^2), x)
```

Giac [N/A]

Not integrable

Time = 0.56 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin(cx)+a)x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.14 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2\,x^2)^{5/2}}{x^2\,(a+b\,\mathrm{asin}\,(c\,x))}\,dx$$

```
[In] int((1 - c^2*x^2)^(5/2)/(x^2*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(5/2)/(x^2*(a + b*asin(c*x))), x)
```

3.339 $\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 4.69 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.50 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x^3\left(a+b\arcsin\left(cx\right)\right)}dx$$

```
[In] int((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.75

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin\left(cx\right)+a)x^3}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*x^3*arcsin(c*x) +
a*x^3), x)
```

Sympy [N/A]

Not integrable

Time = 4.00 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))}\,dx = \int \frac{(-(cx-1)(cx+1))^{\frac{5}{2}}}{x^3(a+b\operatorname{asin}(cx))}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**3/(a+b*asin(c*x)),x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x**3*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.52 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin(cx)+a)x^3}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^3), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))}\,dx=\int \frac{{\left(1-c^2\,x^2\right)}^{5/2}}{x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

```
[In] int((1 - c^2*x^2)^(5/2)/(x^3*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(5/2)/(x^3*(a + b*asin(c*x))), x)
```

3.340 $\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 1.35 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))}\,dx=\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.93 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x^4\left(a+b\arcsin\left(cx\right)\right)}dx$$

```
[In] int((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x)
[Out] int((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.75

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))}\,dx=\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin\left(cx\right)+a)x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b*x^4*arcsin(c*x) +
a*x^4), x)
```

Sympy [N/A]

Not integrable

Time = 4.48 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{(-(cx-1)\,(cx+1))^{\frac{5}{2}}}{x^4\,(a+b\,\mathrm{asin}\,(cx))}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**4/(a+b*asin(c*x)),x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x**4*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.50 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin\,(cx)+a)x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^4), x)
```

Giac [N/A]

Not integrable

Time = 1.58 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin\,(cx)+a)x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)*x^4), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))}\,dx = \int \frac{(1-c^2\,x^2)^{5/2}}{x^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}\,dx$$

```
[In] int((1 - c^2*x^2)^(5/2)/(x^4*(a + b*asin(c*x))),x)
[Out] int((1 - c^2*x^2)^(5/2)/(x^4*(a + b*asin(c*x))), x)
```

3.341 $\int \frac{x^4}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 41

$$\int \frac{x^4}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = -\frac{\text{CosIntegral}(2\arcsin(ax))}{2a^5} + \frac{\text{CosIntegral}(4\arcsin(ax))}{8a^5} + \frac{3\log(\arcsin(ax))}{8a^5}$$

```
[Out] -1/2*Ci(2*arcsin(a*x))/a^5+1/8*Ci(4*arcsin(a*x))/a^5+3/8*ln(arcsin(a*x))/a^
5
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {4809, 3393, 3383}

$$\int \frac{x^4}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = -\frac{\text{CosIntegral}(2\arcsin(ax))}{2a^5} + \frac{\text{CosIntegral}(4\arcsin(ax))}{8a^5} + \frac{3\log(\arcsin(ax))}{8a^5}$$

```
[In] Int[x^4/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] -1/2*CosIntegral[2*ArcSin[a*x]]/a^5 + CosIntegral[4*ArcSin[a*x]]/(8*a^5) +
(3*Log[ArcSin[a*x]])/(8*a^5)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
```

```
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\sin^4(x)}{x}\,dx, x, \arcsin(ax)\right)}{a^5}\\
&= \frac{\text{Subst}\left(\int \left(\frac{3}{8x} - \frac{\cos(2x)}{2x} + \frac{\cos(4x)}{8x}\right)\,dx, x, \arcsin(ax)\right)}{a^5}\\
&= \frac{3\log(\arcsin(ax))}{8a^5} + \frac{\text{Subst}\left(\int \frac{\cos(4x)}{x}\,dx, x, \arcsin(ax)\right)}{8a^5} - \frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx, x, \arcsin(ax)\right)}{2a^5}\\
&= -\frac{\text{CosIntegral}(2\arcsin(ax))}{2a^5} + \frac{\text{CosIntegral}(4\arcsin(ax))}{8a^5} + \frac{3\log(\arcsin(ax))}{8a^5}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 33, normalized size of antiderivative = 0.80

$$\int \frac{x^4}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = -\frac{4\,\text{CosIntegral}(2\arcsin(ax)) - \text{CosIntegral}(4\arcsin(ax)) - 3\log(\arcsin(ax))}{8a^5}$$

```
[In] Integrate[x^4/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] -1/8*(4*CosIntegral[2*ArcSin[a*x]] - CosIntegral[4*ArcSin[a*x]] - 3*Log[Arc
Sin[a*x]])/a^5
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 30, normalized size of antiderivative = 0.73

method	result	size
default	$\frac{3\ln(\arcsin(ax))-4\operatorname{Ci}(2\arcsin(ax))+\operatorname{Ci}(4\arcsin(ax))}{8a^5}$	30

```
[In] int(x^4/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/8*(3*ln(arcsin(a*x))-4*Ci(2*arcsin(a*x))+Ci(4*arcsin(a*x)))/a^5
```

Fricas [F]

$$\int \frac{x^4}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^4}{\sqrt{-a^2x^2+1}\arcsin(ax)}\,dx$$

```
[In] integrate(x^4/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^4/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F]

$$\int \frac{x^4}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^4}{\sqrt{-(ax-1)(ax+1)}\operatorname{asin}(ax)}\,dx$$

```
[In] integrate(x**4/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x**4/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Maxima [F]

$$\int \frac{x^4}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^4}{\sqrt{-a^2x^2+1}\arcsin(ax)}\,dx$$

```
[In] integrate(x^4/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^4/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.85

$$\int \frac{x^4}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{\operatorname{Ci}\left(4\arcsin\left(ax\right)\right)}{8\,a^5} - \frac{\operatorname{Ci}\left(2\arcsin\left(ax\right)\right)}{2\,a^5} + \frac{3\,\log\left(\arcsin\left(ax\right)\right)}{8\,a^5}$$

```
[In] integrate(x^4/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] 1/8*cos_integral(4*arcsin(a*x))/a^5 - 1/2*cos_integral(2*arcsin(a*x))/a^5 +
 3/8*log(arcsin(a*x))/a^5
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^4}{\mathrm{asin}\left(a\,x\right)\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(x^4/(asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] int(x^4/(asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.342 $\int \frac{x^3}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 27

$$\int \frac{x^3}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{3\text{Si}(\arcsin(ax))}{4a^4} - \frac{\text{Si}(3\arcsin(ax))}{4a^4}$$

```
[Out] 3/4*Si(arcsin(a*x))/a^4-1/4*Si(3*arcsin(a*x))/a^4
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4809, 3393, 3380}

$$\int \frac{x^3}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{3\text{Si}(\arcsin(ax))}{4a^4} - \frac{\text{Si}(3\arcsin(ax))}{4a^4}$$

```
[In] Int[x^3/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] (3*SinIntegral[ArcSin[a*x]])/(4*a^4) - SinIntegral[3*ArcSin[a*x]]/(4*a^4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
```

```
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\sin^3(x)}{x}\,dx, x, \arcsin(ax)\right)}{a^4} \\
&= \frac{\text{Subst}\left(\int \left(\frac{3\sin(x)}{4x} - \frac{\sin(3x)}{4x}\right)\,dx, x, \arcsin(ax)\right)}{a^4} \\
&= -\frac{\text{Subst}\left(\int \frac{\sin(3x)}{x}\,dx, x, \arcsin(ax)\right)}{4a^4} + \frac{3\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \arcsin(ax)\right)}{4a^4} \\
&= \frac{3\text{Si}(\arcsin(ax))}{4a^4} - \frac{\text{Si}(3\arcsin(ax))}{4a^4}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.81

$$\int \frac{x^3}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = -\frac{-3\text{Si}(\arcsin(ax)) + \text{Si}(3\arcsin(ax))}{4a^4}$$

```
[In] Integrate[x^3/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] -1/4*(-3*SinIntegral[ArcSin[a*x]] + SinIntegral[3*ArcSin[a*x]])/a^4
```

Maple [A] (verified)

Time = 0.10 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.78

method	result	size
default	$-\frac{\text{Si}(3\arcsin(ax)) - 3\ \text{Si}(\arcsin(ax))}{4a^4}$	21

```
[In] int(x^3/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*(Si(3*arcsin(a*x))-3*Si(arcsin(a*x)))/a^4
```

Fricas [F]

$$\int \frac{x^3}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^3}{\sqrt{-a^2x^2+1}\arcsin{(ax)}}\,dx$$

```
[In] integrate(x^3/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^3/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F]

$$\int \frac{x^3}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^3}{\sqrt{-(ax-1)(ax+1)}\operatorname{asin}{(ax)}}\,dx$$

```
[In] integrate(x**3/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x**3/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Maxima [F]

$$\int \frac{x^3}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^3}{\sqrt{-a^2x^2+1}\arcsin{(ax)}}\,dx$$

```
[In] integrate(x^3/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^3/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^3}{\operatorname{asin}(a\,x)\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(x^3/(asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] int(x^3/(asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.343 $\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 27

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx=-\frac{\text{CosIntegral}(2\arcsin(ax))}{2a^3}+\frac{\log(\arcsin(ax))}{2a^3}$$

```
[Out] -1/2*Ci(2*arcsin(a*x))/a^3+1/2*ln(arcsin(a*x))/a^3
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4809, 3393, 3383}

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx=\frac{\log(\arcsin(ax))}{2a^3}-\frac{\text{CosIntegral}(2\arcsin(ax))}{2a^3}$$

```
[In] Int[x^2/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] -1/2*CosIntegral[2*ArcSin[a*x]]/a^3 + Log[ArcSin[a*x]]/(2*a^3)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
```

```
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\sin^2(x)}{x}\,dx, x, \arcsin(ax)\right)}{a^3}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{2x} - \frac{\cos(2x)}{2x}\right)\,dx, x, \arcsin(ax)\right)}{a^3}\\
&= \frac{\log(\arcsin(ax))}{2a^3} - \frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx, x, \arcsin(ax)\right)}{2a^3}\\
&= -\frac{\text{CosIntegral}(2\arcsin(ax))}{2a^3} + \frac{\log(\arcsin(ax))}{2a^3}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.81

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = -\frac{\text{CosIntegral}(2\arcsin(ax)) - \log(\arcsin(ax))}{2a^3}$$

```
[In] Integrate[x^2/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] -1/2*(CosIntegral[2*ArcSin[a*x]] - Log[ArcSin[a*x]])/a^3
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.78

method	result	size
default	$\frac{\ln(\arcsin(ax))-\mathrm{Ci}(2\arcsin(ax))}{2a^3}$	21

```
[In] int(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*(ln(arcsin(a*x))-Ci(2*arcsin(a*x)))/a^3
```

Fricas [F]

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^2}{\sqrt{-a^2x^2+1}\arcsin{(ax)}}\,dx$$

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^2/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F]

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^2}{\sqrt{-(ax-1)(ax+1)}\operatorname{asin}{(ax)}}\,dx$$

```
[In] integrate(x**2/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x**2/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Maxima [F]

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^2}{\sqrt{-a^2x^2+1}\arcsin{(ax)}}\,dx$$

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^2/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.85

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = -\frac{\operatorname{Ci}{(2\arcsin{(ax)})}}{2a^3} + \frac{\log{(\arcsin{(ax)})}}{2a^3}$$

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] -1/2*cos_integral(2*arcsin(a*x))/a^3 + 1/2*log(arcsin(a*x))/a^3
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^2}{\mathrm{asin}\left(a\,x\right)\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(x^2/(asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] int(x^2/(asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.344 $\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 27

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = -\frac{\text{CosIntegral}(2\arcsin(ax))}{2a^3} + \frac{\log(\arcsin(ax))}{2a^3}$$

```
[Out] -1/2*Ci(2*arcsin(a*x))/a^3+1/2*ln(arcsin(a*x))/a^3
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {4809, 3393, 3383}

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{\log(\arcsin(ax))}{2a^3} - \frac{\text{CosIntegral}(2\arcsin(ax))}{2a^3}$$

```
[In] Int[x^2/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] -1/2*CosIntegral[2*ArcSin[a*x]]/a^3 + Log[ArcSin[a*x]]/(2*a^3)
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
```

```
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\sin^2(x)}{x}\,dx, x, \arcsin(ax)\right)}{a^3}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{2x}-\frac{\cos(2x)}{2x}\right)\,dx, x, \arcsin(ax)\right)}{a^3}\\
&= \frac{\log(\arcsin(ax))}{2a^3}-\frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx, x, \arcsin(ax)\right)}{2a^3}\\
&= -\frac{\text{CosIntegral}(2\arcsin(ax))}{2a^3}+\frac{\log(\arcsin(ax))}{2a^3}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.81

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = -\frac{\text{CosIntegral}(2\arcsin(ax))-\log(\arcsin(ax))}{2a^3}$$

```
[In] Integrate[x^2/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] -1/2*(CosIntegral[2*ArcSin[a*x]] - Log[ArcSin[a*x]])/a^3
```

Maple [A] (verified)

Time = 0.00 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.78

method	result	size
default	$\frac{\ln(\arcsin(ax))-\operatorname{Ci}(2\arcsin(ax))}{2a^3}$	21

```
[In] int(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*(ln(arcsin(a*x))-Ci(2*arcsin(a*x)))/a^3
```

Fricas [F]

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^2}{\sqrt{-a^2x^2+1}\arcsin(ax)}\,dx$$

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^2/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F]

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^2}{\sqrt{-(ax-1)(ax+1)}\,\mathrm{asin}(ax)}\,dx$$

```
[In] integrate(x**2/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x**2/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Maxima [F]

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^2}{\sqrt{-a^2x^2+1}\arcsin(ax)}\,dx$$

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^2/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.85

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = -\frac{\mathrm{Ci}\,(2\arcsin(ax))}{2a^3} + \frac{\log(\arcsin(ax))}{2a^3}$$

```
[In] integrate(x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] -1/2*cos_integral(2*arcsin(a*x))/a^3 + 1/2*log(arcsin(a*x))/a^3
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^2}{\mathrm{asin}\,(a\,x)\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(x^2/(asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] int(x^2/(asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.345 $\int \frac{x}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 9

$$\int \frac{x}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{\text{Si}(\arcsin(ax))}{a^2}$$

```
[Out] Si(arcsin(a*x))/a^2
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 9, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {4809, 3380}

$$\int \frac{x}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{\text{Si}(\arcsin(ax))}{a^2}$$

```
[In] Int[x/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] SinIntegral[ArcSin[a*x]]/a^2
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
```

```
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \arcsin(ax)\right)}{a^2}\\ &= \frac{\text{Si}(\arcsin(ax))}{a^2}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 9, normalized size of antiderivative = 1.00

$$\int \frac{x}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{\text{Si}(\arcsin(ax))}{a^2}$$

```
[In] Integrate[x/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] SinIntegral[ArcSin[a*x]]/a^2
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 10, normalized size of antiderivative = 1.11

method	result	size
default	$\frac{\text{Si}(\arcsin(ax))}{a^2}$	10

```
[In] int(x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] Si(arcsin(a*x))/a^2
```

Fricas [F]

$$\int \frac{x}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x}{\sqrt{-a^2x^2+1}\arcsin(ax)}\,dx$$

```
[In] integrate(x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [F]

$$\int \frac{x}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x}{\sqrt{-(ax-1)(ax+1)}\operatorname{asin}(ax)}\,dx$$

```
[In] integrate(x/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Maxima [F]

$$\int \frac{x}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x}{\sqrt{-a^2x^2+1}\arcsin(ax)}\,dx$$

```
[In] integrate(x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 9, normalized size of antiderivative = 1.00

$$\int \frac{x}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{\operatorname{Si}(\arcsin(ax))}{a^2}$$

```
[In] integrate(x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] sin_integral(arcsin(a*x))/a^2
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x}{\operatorname{asin}(a\,x)\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(x/(asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] int(x/(asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.346 $\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 9

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{\log(\arcsin(ax))}{a}$$

```
[Out] ln(arcsin(a*x))/a
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 9, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4735}

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{\log(\arcsin(ax))}{a}$$

```
[In] Int[1/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] Log[ArcSin[a*x]]/a
```

Rule 4735

```
Int[1/(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*Sqrt[(d_) + (e_.)*(x_)^2]), x_Sym
bol] :> Simp[(1/(b*c))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*Log[a + b*Ar
cSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

Rubi steps

$$\text{integral} = \frac{\log(\arcsin(ax))}{a}$$

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 9, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{\log(\arcsin(ax))}{a}$$

```
[In] Integrate[1/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] Log[ArcSin[a*x]]/a
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 10, normalized size of antiderivative = 1.11

method	result	size
derivativedivides	$\frac{\ln(\arcsin(ax))}{a}$	10
default	$\frac{\ln(\arcsin(ax))}{a}$	10

```
[In] int(1/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] ln(arcsin(a*x))/a
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 11, normalized size of antiderivative = 1.22

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{\log(-\arcsin(ax))}{a}$$

```
[In] integrate(1/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] log(-arcsin(a*x))/a
```

Sympy [A] (verification not implemented)

Time = 0.22 (sec) , antiderivative size = 7, normalized size of antiderivative = 0.78

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{\log(\operatorname{asin}(ax))}{a}$$

```
[In] integrate(1/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] log(asin(a*x))/a
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 9, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{\log(\arcsin(ax))}{a}$$

```
[In] integrate(1/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] log(arcsin(a*x))/a
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 10, normalized size of antiderivative = 1.11

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{\log(|\arcsin(ax)|)}{a}$$

```
[In] integrate(1/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] log(abs(arcsin(a*x)))/a
```

Mupad [B] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 9, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \frac{\ln(\operatorname{asin}(a\,x))}{a}$$

```
[In] int(1/(asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] log(asin(a*x))/a
```

3.347 $\int \frac{1}{x\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{1}{x\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \text{Int}\left(\frac{1}{x\sqrt{1-a^2x^2}\arcsin(ax)},x\right)$$

```
[Out] Unintegrable(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.05 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{1}{x\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$$

```
[In] Int[1/(x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
```

```
[Out] Defer[Int][1/(x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{x\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$$

Mathematica [N/A]

Not integrable

Time = 1.87 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{1}{x\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{1}{x\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$$

```
[In] Integrate[1/(x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] Integrate[1/(x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.24 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{1}{x\arcsin(ax)\sqrt{-a^2x^2+1}}dx$$

```
[In] int(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
[Out] int(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.46

$$\int \frac{1}{x\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{1}{\sqrt{-a^2x^2+1}x\arcsin(ax)}\,dx$$

```
[In] integrate(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)/((a^2*x^3 - x)*arcsin(a*x)), x)
```

Sympy [N/A]

Not integrable

Time = 0.44 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{1}{x\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{1}{x\sqrt{-(ax-1)(ax+1)}\operatorname{asin}(ax)}\,dx$$

```
[In] integrate(1/x/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(1/(x*sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{1}{x\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{1}{\sqrt{-a^2x^2+1}x\arcsin{(ax)}}\,dx$$

```
[In] integrate(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)), x)
```

Giac [N/A]

Not integrable

Time = 0.31 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{1}{x\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{1}{\sqrt{-a^2x^2+1}x\arcsin{(ax)}}\,dx$$

```
[In] integrate(1/x/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)), x)
```

Mupad [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{1}{x\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{1}{x\,\mathrm{asin}\left(a\,x\right)\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(1/(x*asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] int(1/(x*asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.348 $\int \frac{1}{x^2\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{1}{x^2\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \mathrm{Int}\left(\frac{1}{x^2\sqrt{1-a^2x^2}\arcsin(ax)},x\right)$$

```
[Out] Unintegrable(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{x^2\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{1}{x^2\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$$

```
[In] Int[1/(x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] Defer[Int][1/(x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{x^2\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.11 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{1}{x^2\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{1}{x^2\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$$

```
[In] Integrate[1/(x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] Integrate[1/(x^2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.07 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{1}{x^2\arcsin(ax)\sqrt{-a^2x^2+1}}dx$$

```
[In] int(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
[Out] int(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.54

$$\int \frac{1}{x^2\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{1}{\sqrt{-a^2x^2+1}x^2\arcsin(ax)}\,dx$$

```
[In] integrate(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)/((a^2*x^4 - x^2)*arcsin(a*x)), x)
```

Sympy [N/A]

Not integrable

Time = 0.45 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{1}{x^2\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{1}{x^2\sqrt{-(ax-1)(ax+1)}\,\mathrm{asin}(ax)}\,dx$$

```
[In] integrate(1/x**2/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(1/(x**2*sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.39 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{1}{\sqrt{-a^2x^2+1}x^2\arcsin(ax)}\,dx$$

```
[In] integrate(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(-a^2*x^2 + 1)*x^2*arcsin(a*x)), x)
```

Giac [N/A]

Not integrable

Time = 0.30 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{1}{\sqrt{-a^2x^2+1}x^2\arcsin(ax)}\,dx$$

```
[In] integrate(1/x^2/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-a^2*x^2 + 1)*x^2*arcsin(a*x)), x)
```

Mupad [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{1}{x^2\,\mathrm{asin}\left(a\,x\right)\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(1/(x^2*asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] int(1/(x^2*asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.349 $\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 183

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = -\frac{5\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8bc^6} + \frac{5\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16bc^6} - \frac{\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{16bc^6} + \frac{5\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^6} - \frac{5\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^6} + \frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^6}$$

```
[Out] 5/8*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^6-5/16*cos(3*a/b)*Si(3*(a+b*arcsin
(c*x))/b)/b/c^6+1/16*cos(5*a/b)*Si(5*(a+b*arcsin(c*x))/b)/b/c^6-5/8*Ci((a+b
*arcsin(c*x))/b)*sin(a/b)/b/c^6+5/16*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b
/c^6-1/16*Ci(5*(a+b*arcsin(c*x))/b)*sin(5*a/b)/b/c^6
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4809, 3393, 3384, 3380, 3383}

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = -\frac{5\sin\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^6} + \frac{5\sin\left(\frac{3a}{b}\right)\operatorname{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^6} - \frac{\sin\left(\frac{5a}{b}\right)\operatorname{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^6} + \frac{5\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^6} - \frac{5\cos\left(\frac{3a}{b}\right)\operatorname{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^6} + \frac{\cos\left(\frac{5a}{b}\right)\operatorname{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^6}$$

```
[In] Int[x^5/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] (-5*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(8*b*c^6) + (5*CosIntegral
[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b*c^6) - (CosIntegral[(5*(a +
 b*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(16*b*c^6) + (5*Cos[a/b]*SinIntegral[(a +
 b*ArcSin[c*x])/b])/(8*b*c^6) - (5*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSi
n[c*x]))/b])/(16*b*c^6) + (Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))
/b])/(16*b*c^6)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{\text{Subst}\left(\int \frac{\sin^5\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^6}$$

$$= -\frac{\text{Subst}\left(\int \left(\frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x}-\frac{5\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x}+\frac{5\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right)\,dx, x, a+b\arcsin(cx)\right)}{bc^6}$$

$$= -\frac{\text{Subst}\left(\int \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^6} + \frac{5\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^6} - \frac{5\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8bc^6}$$

$$
\begin{aligned}
&= \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8bc^6}\\
&\quad-\frac{\left(5\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16bc^6}\\
&\quad+\frac{\cos\left(\frac{5a}{b}\right)\text{Subst}\left(\int\frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16bc^6}\\
&\quad-\frac{\left(5\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8bc^6}\\
&\quad+\frac{\left(5\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16bc^6}\\
&\quad-\frac{\sin\left(\frac{5a}{b}\right)\text{Subst}\left(\int\frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16bc^6}\\
&= -\frac{5\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8bc^6}+\frac{5\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16bc^6}\\
&\quad-\frac{\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{16bc^6}+\frac{5\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^6}\\
&\quad-\frac{5\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^6}+\frac{\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^6}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 136, normalized size of antiderivative = 0.74

$$
\int\frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = -\frac{10\,\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)-5\,\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{3a}{b}\right)+\text{CosIntegral}\left(5\right.}{}
$$

```
[In] Integrate[x^5/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -1/16*(10*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - 5*CosIntegral[3*(a/b +
ArcSin[c*x])]*Sin[(3*a)/b] + CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/b
] - 10*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 5*Cos[(3*a)/b]*SinIntegral
[3*(a/b + ArcSin[c*x])] - Cos[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/
(b*c^6)
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 139, normalized size of antiderivative = 0.76

method	result
default	$\frac{\mathrm{Si}\left(5\arcsin(cx)+\frac{5a}{b}\right)\cos\left(\frac{5a}{b}\right)-\mathrm{Ci}\left(5\arcsin(cx)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)-5\ \mathrm{Si}\left(3\arcsin(cx)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)+5\ \mathrm{Ci}\left(3\arcsin(cx)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)+10\ \mathrm{Si}(}{16c^6b}$

[In] int(x^5/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)

[Out] 1/16/c^6*(Si(5*arcsin(c*x)+5*a/b)*cos(5*a/b)-Ci(5*arcsin(c*x)+5*a/b)*sin(5*a/b)-5*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)+5*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)+10*Si(arcsin(c*x)+a/b)*cos(a/b)-10*Ci(arcsin(c*x)+a/b)*sin(a/b))/b

Fricas [F]

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^5}{\sqrt{-c^2x^2+1}(b\arcsin{(cx)}+a)}\,dx$$

[In] integrate(x^5/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-c^2*x^2 + 1)*x^5/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) - a), x)

Sympy [F]

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^5}{\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}{(cx)})}\,dx$$

[In] integrate(x**5/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)

[Out] Integral(x**5/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)

Maxima [F]

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^5}{\sqrt{-c^2x^2+1}(b\arcsin{(cx)}+a)}\,dx$$

[In] integrate(x^5/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] integrate(x^5/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)

Giac [F(-2)]

Exception generated.

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^5/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^5}{(a+b\,\mathrm{asin}\,(c\,x))\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(x^5/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
```

```
[Out] int(x^5/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.350 $\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 144

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = -\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc^5} + \frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc^5} + \frac{3\log(a+b\arcsin(cx))}{8bc^5} - \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc^5} + \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc^5}$$

```
[Out] -1/2*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c^5+1/8*Ci(4*(a+b*arcsin(c*x))/
b)*cos(4*a/b)/b/c^5+3/8*ln(a+b*arcsin(c*x))/b/c^5-1/2*Si(2*(a+b*arcsin(c*x)
)/b)*sin(2*a/b)/b/c^5+1/8*Si(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b/c^5
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used

$= \{4809, 3393, 3384, 3380, 3383\}$

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = -\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc^5} + \frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc^5} - \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc^5} + \frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc^5} + \frac{3\log(a+b\arcsin(cx))}{8bc^5}$$

```
[In] Int[x^4/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -1/2*(Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(b*c^5) + (Cos[(
4*a)/b]*CosIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b*c^5) + (3*Log[a + b*Ar
cSin[c*x]])/(8*b*c^5) - (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b
])/(2*b*c^5) + (Sin[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(8*b*c
^5)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^5}\\
&= \frac{\text{Subst}\left(\int \left(\frac{3}{8x}+\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8x}-\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\right)\,dx, x, a+b\arcsin(cx)\right)}{bc^5}\\
&= \frac{3\log(a+b\arcsin(cx))}{8bc^5}+\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8bc^5}\\
&\quad-\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc^5}\\
&= \frac{3\log(a+b\arcsin(cx))}{8bc^5}-\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc^5}\\
&\quad+\frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8bc^5}\\
&\quad-\frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc^5}\\
&\quad+\frac{\sin\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8bc^5}\\
&= -\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc^5}+\frac{\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc^5}\\
&\quad+\frac{3\log(a+b\arcsin(cx))}{8bc^5}-\frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc^5}+\frac{\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8bc^5}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 108, normalized size of antiderivative = 0.75

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \frac{-4\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)+\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\arcsin(cx)\right)\right)+3\log(a+b\,\text{arc}}{8bc^5}$$

```
[In] Integrate[x^4/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] (-4*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] + Cos[(4*a)/b]*CosInteg
ral[4*(a/b + ArcSin[c*x])] + 3*Log[a + b*ArcSin[c*x]] - 4*Sin[(2*a)/b]*SinI
ntegral[2*(a/b + ArcSin[c*x])] + Sin[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c
*x])])/(8*b*c^5)
```

Maple [A] (verified)

Time = 0.22 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.77

method	result
default	$\frac{\text{Si}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)+\text{Ci}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)-4\ \text{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)-4\ \text{Ci}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)+3\ln(}{8c^5b}$

```
[In] int(x^4/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/8/c^5*(Si(4*arcsin(c*x)+4*a/b)*sin(4*a/b)+Ci(4*arcsin(c*x)+4*a/b)*cos(4*a
/b)-4*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)-4*Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/
b)+3*ln(a+b*arcsin(c*x)))/b
```

Fricas [F]

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^4}{\sqrt{-c^2x^2+1}(b\arcsin{(cx)}+a)}\,dx$$

```
[In] integrate(x^4/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^4/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) -
 a), x)
```

Sympy [F]

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\int \frac{x^4}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

```
[In] integrate(x**4/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(x**4/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Maxima [F]

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\int \frac{x^4}{\sqrt{-c^2x^2+1}(b\arcsin\left(cx\right)+a)}\,dx$$

```
[In] integrate(x^4/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^4/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 254, normalized size of antiderivative = 1.76

$$\begin{aligned}\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=&\frac{\cos\left(\frac{a}{b}\right)^4\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{bc^5}\\&+\frac{\cos\left(\frac{a}{b}\right)^3\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{bc^5}\\&-\frac{\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{bc^5}\\&-\frac{\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{bc^5}\\&-\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{2bc^5}\\&-\frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{bc^5}\\&+\frac{\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin\left(cx\right)\right)}{8bc^5}+\frac{\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin\left(cx\right)\right)}{2bc^5}\\&+\frac{3\log\left(b\arcsin\left(cx\right)+a\right)}{8bc^5}\end{aligned}$$

```
[In] integrate(x^4/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) + cos(a/b)^3*sin(a/b
)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) - cos(a/b)^2*cos_integral(4*a
/b + 4*arcsin(c*x))/(b*c^5) - cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x)
)/(b*c^5) - 1/2*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin(c*x))/(b*c^
5) - cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^5) + 1/8*co
s_integral(4*a/b + 4*arcsin(c*x))/(b*c^5) + 1/2*cos_integral(2*a/b + 2*arcs
in(c*x))/(b*c^5) + 3/8*log(b*arcsin(c*x) + a)/(b*c^5)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^4}{(a+b\,\mathrm{asin}\,(c\,x))\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(x^4/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
[Out] int(x^4/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.351 $\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 121

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = -\frac{3\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4bc^4} + \frac{\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4bc^4} + \frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4bc^4} - \frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4bc^4}$$

```
[Out] 3/4*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^4-1/4*cos(3*a/b)*Si(3*(a+b*arcsin(
c*x))/b)/b/c^4-3/4*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b/c^4+1/4*Ci(3*(a+b*arc
sin(c*x))/b)*sin(3*a/b)/b/c^4
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used

$= \{4809, 3393, 3384, 3380, 3383\}$

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = -\frac{3\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4bc^4} + \frac{\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4bc^4} + \frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4bc^4} - \frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4bc^4}$$

```
[In] Int[x^3/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] (-3*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(4*b*c^4) + (CosIntegral[(
3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b*c^4) + (3*Cos[a/b]*SinIntegral
[(a + b*ArcSin[c*x])/b])/(4*b*c^4) - (Cos[(3*a)/b]*SinIntegral[(3*(a + b*Ar
cSin[c*x]))/b])/(4*b*c^4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\text{Subst}\left(\int \frac{\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^4}\\
&= -\frac{\text{Subst}\left(\int \left(-\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{3\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)\,dx, x, a+b\arcsin(cx)\right)}{bc^4}\\
&= \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4bc^4}-\frac{3\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4bc^4}\\
&= \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4bc^4}\\
&\quad -\frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4bc^4}\\
&\quad -\frac{\left(3\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4bc^4}\\
&\quad +\frac{\sin\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4bc^4}\\
&= -\frac{3\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4bc^4}+\frac{\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4bc^4}\\
&\quad +\frac{3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4bc^4}-\frac{\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4bc^4}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.76

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = -\frac{3\,\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)-\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{3a}{b}\right)-3\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{arc}\right.}{4bc^4}$$

```
[In] Integrate[x^3/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

[Out] -1/4*(3*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - CosIntegral[3*(a/b + ArcSin[c*x])]*Sin[(3*a)/b] - 3*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])])/(b*c^4)

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.77

method	result	size
default	$-\frac{\operatorname{Si}\left(3 \arcsin \left(c x\right)+\frac{3 a}{b}\right) \cos \left(\frac{3 a}{b}\right)-\operatorname{Ci}\left(3 \arcsin \left(c x\right)+\frac{3 a}{b}\right) \sin \left(\frac{3 a}{b}\right)-3 \,\operatorname{Si}\left(\arcsin \left(c x\right)+\frac{a}{b}\right) \cos \left(\frac{a}{b}\right)+3 \,\operatorname{Ci}\left(\arcsin \left(c x\right)+\frac{a}{b}\right) \sin \left(\frac{a}{b}\right)}{4 c^{4} b}$	93

[In] int(x^3/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)

[Out] -1/4/c^4*(Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)-Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)-3*Si(arcsin(c*x)+a/b)*cos(a/b)+3*Ci(arcsin(c*x)+a/b)*sin(a/b))/b

Fricas [F]

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^{3}}{\sqrt{-c^{2} x^{2} + 1} (b \arcsin \left(c x\right) + a)}\,dx$$

[In] integrate(x^3/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-c^2*x^2 + 1)*x^3/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) - a), x)

Sympy [F]

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^{3}}{\sqrt{-\left(cx - 1\right)\left(cx + 1\right)}\left(a + b \operatorname{asin}{\left(cx \right)}\right)}\,dx$$

[In] integrate(x**3/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)

[Out] Integral(x**3/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)

Maxima [F]

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^3}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)}\,dx$$

[In] integrate(x^3/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] integrate(x^3/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \text{Exception raised: TypeError}$$

[In] integrate(x^3/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^3}{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{1-c^2\,x^2}}\,dx$$

[In] int(x^3/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)

[Out] int(x^3/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)

3.352 $\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 82

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = -\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc^3} + \frac{\log(a+b\arcsin(cx))}{2bc^3} - \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc^3}$$

```
[Out] -1/2*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b/c^3+1/2*ln(a+b*arcsin(c*x))/b/c
^3-1/2*Si(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b/c^3
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {4809, 3393, 3384, 3380, 3383}

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = -\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc^3} - \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc^3} + \frac{\log(a+b\arcsin(cx))}{2bc^3}$$

```
[In] Int[x^2/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -1/2*(Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))/b])/(b*c^3) + Log[a
+ b*ArcSin[c*x]]/(2*b*c^3) - (Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x
]))/b])/(2*b*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^3}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{2x}-\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\right)\,dx, x, a+b\arcsin(cx)\right)}{bc^3}\\
&= \frac{\log(a+b\arcsin(cx))}{2bc^3}-\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc^3}\\
&= \frac{\log(a+b\arcsin(cx))}{2bc^3}-\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc^3}\\
&\quad-\frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc^3}
\end{aligned}$$

$$= -\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc^3} + \frac{\log(a+b\arcsin(cx))}{2bc^3} - \frac{\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{2bc^3}$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.78

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = -\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right) - \log(a+b\arcsin(cx)) + \sin\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)}{2bc^3}$$

```
[In] Integrate[x^2/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] -1/2*(Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c*x])] - Log[a + b*ArcSin[c*
x]] + Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(b*c^3)
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.79

method	result	size
default	$\frac{-\text{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)-\text{Ci}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)+\ln(a+b\arcsin(cx))}{2c^3b}$	65

```
[In] int(x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/2/c^3*(-Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)-Ci(2*arcsin(c*x)+2*a/b)*cos(2*
a/b)+ln(a+b*arcsin(c*x)))/b
```

Fricas [F]

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^2}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^2/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) -
 a), x)
```

Sympy [F]

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^2}{\sqrt{-(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))}\,dx$$

```
[In] integrate(x**2/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(x**2/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Maxima [F]

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^2}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^2/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.27

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = -\frac{\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^3} - \frac{\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^3} + \frac{\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^3} + \frac{\log(b\arcsin(cx)+a)}{2bc^3}$$

```
[In] integrate(x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] -cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x))/(b*c^3) - cos(a/b)*sin(a/b)
*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^3) + 1/2*cos_integral(2*a/b + 2*a
rcsin(c*x))/(b*c^3) + 1/2*log(b*arcsin(c*x) + a)/(b*c^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^2}{(a+b\,\mathrm{asin}\,(c\,x))\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(x^2/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
[Out] int(x^2/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.353 $\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 54

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = -\frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{bc^2} + \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc^2}$$

```
[Out] cos(a/b)*Si((a+b*arcsin(c*x))/b)/b/c^2-Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b/c
^2
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {4809, 3384, 3380, 3383}

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc^2} - \frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc^2}$$

```
[In] Int[x/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] -((CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b*c^2)) + (Cos[a/b]*SinInt
egral[(a + b*ArcSin[c*x])/b])/(b*c^2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^2}\\
&= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^2}\\
&\quad -\frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc^2}\\
&= -\frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{bc^2}+\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc^2}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.83

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \frac{-\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)+\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc^2}$$

```
[In] Integrate[x/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] (-(CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b]) + Cos[a/b]*SinIntegral[a/b + Ar
cSin[c*x]])/(b*c^2)
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.85

method	result	size
default	$\frac{\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{c^2 b}$	46

```
[In] int(x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/c^2*(Si(arcsin(c*x)+a/b)*cos(a/b)-Ci(arcsin(c*x)+a/b)*sin(a/b))/b
```

Fricas [F]

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) - a
), x)
```

Sympy [F]

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x}{\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))}\,dx$$

```
[In] integrate(x/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(x/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Maxima [F]

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.93

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = -\frac{\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2} + \frac{\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc^2}$$

```
[In] integrate(x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] -cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b*c^2) + cos(a/b)*sin_integral(a
/b + arcsin(c*x))/(b*c^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x}{(a+b\operatorname{asin}(c\,x))\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(x/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
[Out] int(x/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.354 $\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 16

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \frac{\log(a+b\arcsin(cx))}{bc}$$

```
[Out] ln(a+b*arcsin(c*x))/b/c
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {4735}

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \frac{\log(a+b\arcsin(cx))}{bc}$$

```
[In] Int[1/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] Log[a + b*ArcSin[c*x]]/(b*c)
```

Rule 4735

```
Int[1/(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*Sqrt[(d_) + (e_.)*(x_)^2]), x_Sym
bol] :> Simp[(1/(b*c))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*Log[a + b*Ar
cSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

Rubi steps

$$\text{integral} = \frac{\log(a+b\arcsin(cx))}{bc}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\frac{\log(a+b\arcsin(cx))}{bc}$$

```
[In] Integrate[1/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Log[a + b*ArcSin[c*x]]/(b*c)
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.06

method	result	size
derivativedivides	$\frac{\ln(a+b\arcsin(cx))}{bc}$	17
default	$\frac{\ln(a+b\arcsin(cx))}{bc}$	17

```
[In] int(1/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] ln(a+b*arcsin(c*x))/b/c
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 19, normalized size of antiderivative = 1.19

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\frac{\log\left(-b\arcsin\left(cx\right)-a\right)}{bc}$$

```
[In] integrate(1/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] log(-b*arcsin(c*x) - a)/(b*c)
```

Sympy [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.85 (sec) , antiderivative size = 42, normalized size of antiderivative = 2.62

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \begin{cases} \frac{x}{a} & \text{for } b=0 \wedge c=0 \\ \frac{\begin{cases} -\frac{i\operatorname{acosh}(cx)}{c} & \text{for } |c^2x^2|>1 \\ \frac{\operatorname{asin}(cx)}{c} & \text{otherwise} \end{cases}}{a} & \text{for } b=0 \\ \frac{x}{a} & \text{for } c=0 \\ \frac{\log\left(\frac{a}{b}+\operatorname{asin}(cx)\right)}{bc} & \text{otherwise} \end{cases}$$

```
[In] integrate(1/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x/a, Eq(b, 0) & Eq(c, 0)), (Piecewise((-I*acosh(c*x)/c, Abs(c**2
*x**2) > 1), (asin(c*x)/c, True))/a, Eq(b, 0)), (x/a, Eq(c, 0)), (log(a/b +
 asin(c*x))/(b*c), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \frac{\log(b\arcsin(cx)+a)}{bc}$$

```
[In] integrate(1/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] log(b*arcsin(c*x) + a)/(b*c)
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.06

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \frac{\log(|b\arcsin(cx)+a|)}{bc}$$

```
[In] integrate(1/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] log(abs(b*arcsin(c*x) + a))/(b*c)
```

Mupad [B] (verification not implemented)

Time = 0.19 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\frac{\ln\left(a+b\,\mathrm{asin}(c\,x)\right)}{b\,c}$$

```
[In] int(1/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
[Out] log(a + b*asin(c*x))/(b*c)
```

3.355 $\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.08 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

```
[In] Int[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 5.02 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.12 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{1}{x\left(a+b\arcsin\left(cx\right)\right)\sqrt{-c^2x^2+1}}dx$$

```
[In] int(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
[Out] int(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.75

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{\sqrt{-c^2x^2+1}(b\arcsin\left(cx\right)+a)x}\,dx$$

```
[In] integrate(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^2*x^3 - a*x + (b*c^2*x^3 - b*x)*arcsin(c*
x)), x)
```

Sympy [N/A]

Not integrable

Time = 1.26 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{x\sqrt{-(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))}\,dx$$

```
[In] integrate(1/x/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(1/(x*sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)x}\,dx$$

```
[In] integrate(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)*x), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/x/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\int \frac{1}{x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(1/(x*(a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
[Out] int(1/(x*(a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.356 $\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \operatorname{Int}\left(\frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

```
[In] Int[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.11 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.06 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{1}{x^2\left(a+b\arcsin\left(cx\right)\right)\sqrt{-c^2x^2+1}}dx$$

```
[In] int(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
[Out] int(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 53, normalized size of antiderivative = 1.89

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{\sqrt{-c^2x^2+1}(b\arcsin\left(cx\right)+a)x^2}\,dx$$

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^2*x^4 - a*x^2 + (b*c^2*x^4 - b*x^2)*arcsi
n(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 1.04 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{x^2\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))}\,dx$$

```
[In] integrate(1/x**2/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(1/(x**2*sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)x^2}\,dx$$

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)*x^2), x)
```

Giac [N/A]

Not integrable

Time = 0.49 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)x^2}\,dx$$

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)*x^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\int \frac{1}{x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(1/(x^2*(a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
[Out] int(1/(x^2*(a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.357 $\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx$$

```
[In] Int[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 8.54 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{x^2}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.16 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^2}{(-c^2x^2+1)^{\frac{3}{2}}\,(a+b\arcsin(cx))}dx$$

```
[In] int(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
[Out] int(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 63, normalized size of antiderivative = 2.25

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{x^2}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^2/(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b
*c^2*x^2 + b)*arcsin(c*x) + a), x)
```

Sympy [N/A]

Not integrable

Time = 1.77 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{x^2}{\left(-(cx-1)(cx+1)\right)^{\frac{3}{2}}(a+b\,\mathrm{asin}\,(cx))}\,dx$$

```
[In] integrate(x**2/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**2/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{x^2}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(x^2/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.87 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{x^2}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(x^2/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{x^2}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(1-c^2\,x^2\right)}^{3/2}}\,dx$$

```
[In] int(x^2/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)),x)
[Out] int(x^2/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)), x)
```

3.358 $\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 26

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx$$

```
[In] Int[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 10.23 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.08

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.16 (sec) , antiderivative size = 24, normalized size of antiderivative = 0.92

$$\int \frac{x}{(-c^2x^2+1)^{\frac{3}{2}}\,(a+b\arcsin(cx))}dx$$

```
[In] int(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
[Out] int(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 61, normalized size of antiderivative = 2.35

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{x}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x/(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c
^2*x^2 + b)*arcsin(c*x) + a), x)
```

Sympy [N/A]

Not integrable

Time = 2.00 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00

$$\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{x}{(-(cx-1)(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))}\,dx$$

```
[In] integrate(x/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
[Out] Integral(x/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00

$$\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{x}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(x/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{x}{(a+b\,\mathrm{asin}\,(c\,x))\,\left(1-c^2\,x^2\right)^{3/2}}\,dx$$

```
[In] int(x/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)),x)
[Out] int(x/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)), x)
```

3.359 $\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx = \operatorname{Int}\left(\frac{1}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{1}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx$$

```
[In] Int[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.14 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{1}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.06 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{(-c^2x^2+1)^{\frac{3}{2}}\,(a+b\arcsin(cx))}dx$$

```
[In] int(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
[Out] int(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 60, normalized size of antiderivative = 2.40

$$\int \frac{1}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{1}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b*c^2
*x^2 + b)*arcsin(c*x) + a), x)
```

Sympy [N/A]

Not integrable

Time = 2.17 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.04

$$\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(-(cx-1)(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))}\,dx$$

```
[In] integrate(1/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
[Out] Integral(1/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.51 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{1}{(a+b\,\mathrm{asin}\,(c\,x))\,\left(1-c^2\,x^2\right)^{3/2}}\,dx$$

```
[In] int(1/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)),x)
[Out] int(1/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)), x)
```

3.360 $\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{1}{x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.10 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx$$

```
[In] Int[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 8.72 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.77 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{1}{x(-c^2x^2+1)^{\frac{3}{2}}(a+b\arcsin(cx))}dx$$

```
[In] int(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
[Out] int(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 64, normalized size of antiderivative = 2.29

$$\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)x}\,dx$$

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(a*c^4*x^5 - 2*a*c^2*x^3 + a*x + (b*c^4*x^5 - 2
*b*c^2*x^3 + b*x)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 3.91 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{x\left(-(cx-1)(cx+1)\right)^{\frac{3}{2}}(a+b\,\mathrm{asin}\,(cx))}\,dx$$

```
[In] integrate(1/x/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
[Out] Integral(1/(x*(-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)x}\,dx$$

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)*x), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x (1-c^2x^2)^{3/2} (a+b\arcsin(cx))} \, dx = \int \frac{1}{x \ (a+b\,\mathrm{asin}\,(c\,x)) \ (1-c^2\,x^2)^{3/2}} \, dx$$

```
[In] int(1/(x*(a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)),x)
[Out] int(1/(x*(a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)), x)
```

3.361 $\int \frac{1}{x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{1}{x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{1}{x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.10 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx$$

```
[In] Int[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 7.58 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))} \, dx = \int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))} \, dx$$

```
[In] Integrate[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.31 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{1}{x^2 (-c^2x^2+1)^{\frac{3}{2}} (a+b\arcsin(cx))}dx$$

```
[In] int(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
[Out] int(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 68, normalized size of antiderivative = 2.43

$$\int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))} \, dx = \int \frac{1}{(-c^2x^2+1)^{\frac{3}{2}} (b\arcsin(cx)+a)x^2} \, dx$$

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(a*c^4*x^6 - 2*a*c^2*x^4 + a*x^2 + (b*c^4*x^6 -
 2*b*c^2*x^4 + b*x^2)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 2.81 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))} \, dx = \int \frac{1}{x^2 \left(-(cx-1)(cx+1)\right)^{\frac{3}{2}} (a+b\,\mathrm{asin}\,(cx))} \, dx$$

```
[In] integrate(1/x**2/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
[Out] Integral(1/(x**2*(-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.43 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))} \, dx = \int \frac{1}{(-c^2x^2+1)^{\frac{3}{2}} (b\arcsin(cx)+a)x^2} \, dx$$

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)*x^2), x)
```

Giac [N/A]

Not integrable

Time = 3.53 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))} \, dx = \int \frac{1}{(-c^2x^2+1)^{\frac{3}{2}} (b\arcsin(cx)+a)x^2} \, dx$$

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)*x^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))} \, dx = \int \frac{1}{x^2 \, (a+b\,\mathrm{asin}\,(c\,x)) \, (1-c^2\,x^2)^{3/2}} \, dx$$

```
[In] int(1/(x^2*(a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)),x)
[Out] int(1/(x^2*(a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)), x)
```

3.362 $\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx = \operatorname{Int}\left(\frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx = \int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx$$

```
[In] Int[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 6.07 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.61 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^2}{(-c^2x^2+1)^{\frac{5}{2}}\,(a+b\arcsin(cx))}dx$$

```
[In] int(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
[Out] int(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 86, normalized size of antiderivative = 3.07

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{x^2}{(-c^2x^2+1)^{\frac{5}{2}}\,(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^2/(a*c^6*x^6 - 3*a*c^4*x^4 + 3*a*c^2*x^2 + (
b*c^6*x^6 - 3*b*c^4*x^4 + 3*b*c^2*x^2 - b)*arcsin(c*x) - a), x)
```

Sympy [N/A]

Not integrable

Time = 2.10 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{x^2}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)}\,dx$$

```
[In] integrate(x**2/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**2/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.45 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{x^2}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)}\,dx$$

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(x^2/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 2.26 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{x^2}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)}\,dx$$

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(x^2/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{x^2}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(1-c^2\,x^2\right)}^{5/2}}\,dx$$

```
[In] int(x^2/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)),x)
[Out] int(x^2/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)), x)
```

3.363 $\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 26

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx$$

```
[In] Int[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 21.49 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.08

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.62 (sec) , antiderivative size = 24, normalized size of antiderivative = 0.92

$$\int \frac{x}{(-c^2x^2+1)^{\frac{5}{2}}\,(a+b\arcsin(cx))}dx$$

```
[In] int(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
[Out] int(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 84, normalized size of antiderivative = 3.23

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{x}{(-c^2x^2+1)^{\frac{5}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x/(a*c^6*x^6 - 3*a*c^4*x^4 + 3*a*c^2*x^2 + (b*
c^6*x^6 - 3*b*c^4*x^4 + 3*b*c^2*x^2 - b)*arcsin(c*x) - a), x)
```

Sympy [N/A]

Not integrable

Time = 2.05 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{x}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)}\,dx$$

```
[In] integrate(x/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
[Out] Integral(x/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.44 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{x}{(-c^2x^2+1)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)}\,dx$$

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(x/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{x}{(a+b\,\mathrm{asin}\,(c\,x))\,\left(1-c^2\,x^2\right)^{5/2}}\,dx$$

```
[In] int(x/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)),x)
[Out] int(x/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)), x)
```

3.364 $\int \frac{1}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{1}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx$$

```
[In] Int[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.48 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{(-c^2x^2+1)^{\frac{5}{2}}(a+b\arcsin(cx))}dx$$

```
[In] int(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
[Out] int(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 83, normalized size of antiderivative = 3.32

$$\int \frac{1}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(-c^2x^2+1)^{\frac{5}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^6*x^6 - 3*a*c^4*x^4 + 3*a*c^2*x^2 + (b*c^
6*x^6 - 3*b*c^4*x^4 + 3*b*c^2*x^2 - b)*arcsin(c*x) - a), x)
```

Sympy [N/A]

Not integrable

Time = 2.41 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.04

$$\int \frac{1}{\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)}\,dx=\int \frac{1}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)}\,dx$$

```
[In] integrate(1/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
[Out] Integral(1/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.44 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)}\,dx=\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 1.10 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)}\,dx=\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{1}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(1-c^2\,x^2\right)}^{5/2}} \,d x$$

```
[In] int(1/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)),x)
[Out] int(1/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)), x)
```

3.365 $\int \frac{1}{x(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{1}{x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}\,dx$$

```
[In] Int[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 6.83 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)}\,dx=\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)}\,dx$$

```
[In] Integrate[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.66 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{1}{x\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)}dx$$

```
[In] int(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
[Out] int(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 85, normalized size of antiderivative = 3.04

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)}\,dx=\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)x}\,dx$$

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^6*x^7 - 3*a*c^4*x^5 + 3*a*c^2*x^3 - a*x +
 (b*c^6*x^7 - 3*b*c^4*x^5 + 3*b*c^2*x^3 - b*x)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 4.76 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{1}{x\left(1-c^{2}x^{2}\right)^{5/2}(a+b\arcsin(cx))}\,dx=\int \frac{1}{x\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)}\,dx$$

```
[In] integrate(1/x/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
[Out] Integral(1/(x*(-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.43 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x\left(1-c^{2}x^{2}\right)^{5/2}(a+b\arcsin(cx))}\,dx=\int \frac{1}{\left(-c^{2}x^{2}+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)x}\,dx$$

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)*x), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{1}{x\left(1-c^{2}x^{2}\right)^{5/2}(a+b\arcsin(cx))}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}\,dx=\int \frac{1}{x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(1-c^2\,x^2\right)}^{5/2}}\,dx$$

```
[In] int(1/(x*(a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)),x)
[Out] int(1/(x*(a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)), x)
```

3.366 $\int \frac{1}{x^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))}\,dx = \int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))}\,dx$$

```
[In] Int[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 10.60 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{1}{x^2 (1 - c^2x^2)^{5/2} (a + b \arcsin(cx))} \, dx = \int \frac{1}{x^2 (1 - c^2x^2)^{5/2} (a + b \arcsin(cx))} \, dx$$

```
[In] Integrate[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.32 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{1}{x^2 (-c^2x^2 + 1)^{\frac{5}{2}} (a + b \arcsin(cx))} dx$$

```
[In] int(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
[Out] int(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 89, normalized size of antiderivative = 3.18

$$\int \frac{1}{x^2 (1 - c^2x^2)^{5/2} (a + b \arcsin(cx))} \, dx = \int \frac{1}{(-c^2x^2 + 1)^{\frac{5}{2}} (b \arcsin(cx) + a) x^2} \, dx$$

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a*c^6*x^8 - 3*a*c^4*x^6 + 3*a*c^2*x^4 - a*x^2
 + (b*c^6*x^8 - 3*b*c^4*x^6 + 3*b*c^2*x^4 - b*x^2)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 3.16 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))}\,dx = \int \frac{1}{x^2 \left(-(cx-1)(cx+1)\right)^{\frac{5}{2}} (a+b\operatorname{asin}(cx))}\,dx$$

```
[In] integrate(1/x**2/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
[Out] Integral(1/(x**2*(-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.43 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))}\,dx = \int \frac{1}{(-c^2x^2+1)^{\frac{5}{2}} (b\arcsin(cx)+a)x^2}\,dx$$

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)*x^2), x)
```

Giac [N/A]

Not integrable

Time = 9.19 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))}\,dx = \int \frac{1}{(-c^2x^2+1)^{\frac{5}{2}} (b\arcsin(cx)+a)x^2}\,dx$$

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)*x^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))} \, dx = \int \frac{1}{x^2 \, (a+b\,\mathrm{asin}\,(c\,x)) \, (1-c^2\,x^2)^{5/2}} \, dx$$

```
[In] int(1/(x^2*(a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)),x)
[Out] int(1/(x^2*(a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)), x)
```

3.367 $\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \operatorname{Int}\left(\frac{x^m(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)},x\right)$$

```
[Out] Unintegrable(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.08 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx$$

```
[In] Int[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
[Out] Defer[Int][(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\text{integral} = \int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx$$

Mathematica [N/A]

Not integrable

Time = 1.11 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx$$

```
[In] Integrate[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]),x]
[Out] Integrate[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.79 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^m(-c^2x^2+1)^{\frac{5}{2}}}{a+b\arcsin(cx)}dx$$

```
[In] int(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
[Out] int(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.61

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}x^m}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)*x^m/(b*arcsin(c*x) +
a), x)
```

Sympy [N/A]

Not integrable

Time = 177.45 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^m(-(cx-1)\,(cx+1))^{\frac{5}{2}}}{a+b\operatorname{asin}\,(cx)}\,dx$$

```
[In] integrate(x**m*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**m*(-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.54 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}x^m}{b\arcsin\,(cx)+a}\,dx$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(5/2)*x^m/(b*arcsin(c*x) + a), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{a+b\arcsin(cx)}\,dx=\int \frac{x^m\,\left(1-c^2\,x^2\right)^{5/2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((x^m*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)),x)
[Out] int((x^m*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x)), x)
```

3.368 $\int \frac{x^m (1-c^2x^2)^{3/2}}{a+b\arcsin(cx)} \, dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^m (1-c^2x^2)^{3/2}}{a+b\arcsin(cx)} \, dx = \text{Int}\left(\frac{x^m (1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}, x\right)$$

```
[Out] Unintegrable(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m (1-c^2x^2)^{3/2}}{a+b\arcsin(cx)} \, dx = \int \frac{x^m (1-c^2x^2)^{3/2}}{a+b\arcsin(cx)} \, dx$$

```
[In] Int[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]
```

```
[Out] Defer[Int][(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\text{integral} = \int \frac{x^m (1-c^2x^2)^{3/2}}{a+b\arcsin(cx)} \, dx$$

Mathematica [N/A]

Not integrable

Time = 0.61 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx$$

[In] Integrate[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]),x]

[Out] Integrate[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x]), x]

Maple [N/A] (verified)

Not integrable

Time = 0.58 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^m(-c^2x^2+1)^{\frac{3}{2}}}{a+b\arcsin\left(cx\right)}dx$$

[In] int(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)

[Out] int(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 38, normalized size of antiderivative = 1.36

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x^m}{b\arcsin\left(cx\right)+a}\,dx$$

[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] integral(-(c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*x^m/(b*arcsin(c*x) + a), x)

Sympy [N/A]

Not integrable

Time = 15.02 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx=\int \frac{x^m(-(cx-1)\,(cx+1))^{\frac{3}{2}}}{a+b\,\mathrm{asin}\,(cx)}\,dx$$

```
[In] integrate(x**m*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**m*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.50 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx=\int \frac{(-c^2x^2+1)^{\frac{3}{2}}x^m}{b\arcsin\,(cx)+a}\,dx$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((-c^2*x^2 + 1)^(3/2)*x^m/(b*arcsin(c*x) + a), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{a+b\arcsin(cx)}\,dx=\int \frac{x^m\,\left(1-c^2\,x^2\right)^{3/2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((x^m*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)),x)
[Out] int((x^m*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x)), x)
```

3.369 $\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \text{Int}\left(\frac{x^m\sqrt{1-c^2x^2}}{a+b\arcsin(cx)},x\right)$$

```
[Out] Unintegrable(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx = \int \frac{x^m\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx$$

```
[In] Int[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
[Out] Defer[Int][(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\text{integral} = \int \frac{x^m\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx=\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx$$

```
[In] Integrate[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]),x]
[Out] Integrate[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.57 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^m\sqrt{-c^2x^2+1}}{a+b\arcsin\left(cx\right)}dx$$

```
[In] int(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
[Out] int(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx=\int \frac{\sqrt{-c^2x^2+1}x^m}{b\arcsin\left(cx\right)+a}\,dx$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^m/(b*arcsin(c*x) + a), x)
```

Sympy [N/A]

Not integrable

Time = 0.75 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx=\int \frac{x^m\sqrt{-\left(cx-1\right)\left(cx+1\right)}}{a+b\,\mathrm{asin}\left(cx\right)}\,dx$$

```
[In] integrate(x**m*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**m*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx=\int \frac{\sqrt{-c^2x^2+1}x^m}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*x^2 + 1)*x^m/(b*arcsin(c*x) + a), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\,dx=\int \frac{x^m\,\sqrt{1-c^2\,x^2}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((x^m*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)),x)
[Out] int((x^m*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x)), x)
```

3.370 $\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\text{Int}\left(\frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.08 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

```
[In] Int[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral}=\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.98 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Integrate[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.22 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^m}{\sqrt{-c^2x^2+1}\,\left(a+b\arcsin\left(cx\right)\right)}dx$$

```
[In] int(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
[Out] int(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.79

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^m}{\sqrt{-c^2x^2+1}(b\arcsin\left(cx\right)+a)}\,dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^m/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(c*x) -
 a), x)
```

Sympy [N/A]

Not integrable

Time = 0.91 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^m}{\sqrt{-(cx-1)\,(cx+1)}\,(a+b\,\text{asin}\,(cx))}\,dx$$

```
[In] integrate(x**m/(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**m/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^m}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(x^m/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.49 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{x^m}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(x^m/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\int \frac{x^m}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(x^m/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
[Out] int(x^m/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

3.371 $\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx=\text{Int}\left(\frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx$$

```
[In] Int[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral}=\int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 1.38 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.33 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^m}{(-c^2x^2+1)^{\frac{3}{2}}(a+b\arcsin(cx))}dx$$

```
[In] int(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
[Out] int(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 63, normalized size of antiderivative = 2.25

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{x^m}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^m/(a*c^4*x^4 - 2*a*c^2*x^2 + (b*c^4*x^4 - 2*b
*c^2*x^2 + b)*arcsin(c*x) + a), x)
```

Sympy [N/A]

Not integrable

Time = 9.42 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{x^m}{(-(cx-1)(cx+1))^{\frac{3}{2}}(a+b\,\mathrm{asin}\,(cx))}\,dx$$

```
[In] integrate(x**m/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**m/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.44 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{x^m}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(x^m/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.66 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{x^m}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(x^m/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}\,dx=\int \frac{x^m}{(a+b\,\mathrm{asin}\,(c\,x))\,\left(1-c^2\,x^2\right)^{3/2}}\,dx$$

```
[In] int(x^m/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)),x)
[Out] int(x^m/((a + b*asin(c*x))*(1 - c^2*x^2)^(3/2)), x)
```

3.372 $\int \frac{x^m}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx=\operatorname{Int}\left(\frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx$$

```
[In] Int[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral}=\int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 2.07 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.36 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^m}{(-c^2x^2+1)^{\frac{5}{2}}\,(a+b\arcsin(cx))}dx$$

```
[In] int(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
[Out] int(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 86, normalized size of antiderivative = 3.07

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{x^m}{(-c^2x^2+1)^{\frac{5}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^m/(a*c^6*x^6 - 3*a*c^4*x^4 + 3*a*c^2*x^2 + (
b*c^6*x^6 - 3*b*c^4*x^4 + 3*b*c^2*x^2 - b)*arcsin(c*x) - a), x)
```

Sympy [N/A]

Not integrable

Time = 18.37 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx=\int \frac{x^m}{(-(cx-1)(cx+1))^{\frac{5}{2}}(a+b\operatorname{asin}(cx))}\,dx$$

```
[In] integrate(x**m/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x)),x)
[Out] Integral(x**m/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))), x)
```

Maxima [N/A]

Not integrable

Time = 0.45 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx=\int \frac{x^m}{(-c^2x^2+1)^{\frac{5}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(x^m/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 1.25 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}\,dx=\int \frac{x^m}{(-c^2x^2+1)^{\frac{5}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(x^m/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{x^m}{(a+b\,\mathrm{asin}\,(c\,x))\,\left(1-c^2\,x^2\right)^{5/2}}\,dx$$

```
[In] int(x^m/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)),x)
[Out] int(x^m/((a + b*asin(c*x))*(1 - c^2*x^2)^(5/2)), x)
```

3.373 $\int \frac{x^m}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{x^m}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \text{Int}\left(\frac{x^m}{\sqrt{1-a^2x^2}\arcsin(ax)},x\right)$$

```
[Out] Unintegrable(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^m}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$$

```
[In] Int[x^m/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] Defer[Int][x^m/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Rubi steps

$$\text{integral} = \int \frac{x^m}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.43 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{x^m}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^m}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx$$

```
[In] Integrate[x^m/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]),x]
[Out] Integrate[x^m/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.17 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{x^m}{\arcsin(ax)\sqrt{-a^2x^2+1}}dx$$

```
[In] int(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
[Out] int(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.50

$$\int \frac{x^m}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^m}{\sqrt{-a^2x^2+1}\arcsin(ax)}\,dx$$

```
[In] integrate(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m/((a^2*x^2 - 1)*arcsin(a*x)), x)
```

Sympy [N/A]

Not integrable

Time = 0.70 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^m}{\sqrt{-(ax-1)(ax+1)}\operatorname{asin}(ax)}\,dx$$

```
[In] integrate(x**m/asin(a*x)/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x**m/(sqrt(-(a*x - 1)*(a*x + 1))*asin(a*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^m}{\sqrt{-a^2x^2+1}\arcsin{(ax)}}\,dx$$

```
[In] integrate(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] integrate(x^m/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Giac [N/A]

Not integrable

Time = 0.44 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^m}{\sqrt{-a^2x^2+1}\arcsin{(ax)}}\,dx$$

```
[In] integrate(x^m/arcsin(a*x)/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(x^m/(sqrt(-a^2*x^2 + 1)*arcsin(a*x)), x)
```

Mupad [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{\sqrt{1-a^2x^2}\arcsin(ax)}\,dx = \int \frac{x^m}{\mathrm{asin}\left(a\,x\right)\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(x^m/(asin(a*x)*(1 - a^2*x^2)^(1/2)),x)
[Out] int(x^m/(asin(a*x)*(1 - a^2*x^2)^(1/2)), x)
```

3.374 $\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)^2}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 95

$$\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)^2}\,dx = -\frac{c^3(1-a^2x^2)^{7/2}}{a\arcsin(ax)} - \frac{35c^3\mathrm{Si}(\arcsin(ax))}{64a} - \frac{63c^3\mathrm{Si}(3\arcsin(ax))}{64a} - \frac{35c^3\mathrm{Si}(5\arcsin(ax))}{64a} - \frac{7c^3\mathrm{Si}(7\arcsin(ax))}{64a}$$

```
[Out] -c^3*(-a^2*x^2+1)^(7/2)/a/arcsin(a*x)-35/64*c^3*Si(arcsin(a*x))/a-63/64*c^3
*Si(3*arcsin(a*x))/a-35/64*c^3*Si(5*arcsin(a*x))/a-7/64*c^3*Si(7*arcsin(a*x
))/a
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4751, 4809, 4491, 3380}

$$\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)^2}\,dx = -\frac{c^3(1-a^2x^2)^{7/2}}{a\arcsin(ax)} - \frac{35c^3\mathrm{Si}(\arcsin(ax))}{64a} - \frac{63c^3\mathrm{Si}(3\arcsin(ax))}{64a} - \frac{35c^3\mathrm{Si}(5\arcsin(ax))}{64a} - \frac{7c^3\mathrm{Si}(7\arcsin(ax))}{64a}$$

```
[In] Int[(c - a^2*c*x^2)^3/ArcSin[a*x]^2,x]
```

```
[Out] -((c^3*(1 - a^2*x^2)^(7/2))/(a*ArcSin[a*x])) - (35*c^3*SinIntegral[ArcSin[a
*x]])/(64*a) - (63*c^3*SinIntegral[3*ArcSin[a*x]])/(64*a) - (35*c^3*SinInte
gral[5*ArcSin[a*x]])/(64*a) - (7*c^3*SinIntegral[7*ArcSin[a*x]])/(64*a)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{c^3(1-a^2x^2)^{7/2}}{a\arcsin(ax)} - (7ac^3)\int\frac{x(1-a^2x^2)^{5/2}}{\arcsin(ax)}\,dx\\
&= -\frac{c^3(1-a^2x^2)^{7/2}}{a\arcsin(ax)} - \frac{(7c^3)\,\text{Subst}\left(\int\frac{\cos^6(x)\sin(x)}{x}\,dx,x,\arcsin(ax)\right)}{a}\\
&= -\frac{c^3(1-a^2x^2)^{7/2}}{a\arcsin(ax)} - \frac{(7c^3)\,\text{Subst}\left(\int\left(\frac{5\sin(x)}{64x}+\frac{9\sin(3x)}{64x}+\frac{5\sin(5x)}{64x}+\frac{\sin(7x)}{64x}\right)dx,x,\arcsin(ax)\right)}{a}
\end{aligned}$$

$$= -\frac{c^3(1-a^2x^2)^{7/2}}{a\arcsin(ax)} - \frac{(7c^3)\,\text{Subst}\left(\int \frac{\sin(7x)}{x}\,dx, x, \arcsin(ax)\right)}{64a}$$
$$- \frac{(35c^3)\,\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \arcsin(ax)\right)}{64a}$$
$$- \frac{(35c^3)\,\text{Subst}\left(\int \frac{\sin(5x)}{x}\,dx, x, \arcsin(ax)\right)}{64a}$$
$$- \frac{(63c^3)\,\text{Subst}\left(\int \frac{\sin(3x)}{x}\,dx, x, \arcsin(ax)\right)}{64a}$$
$$= -\frac{c^3(1-a^2x^2)^{7/2}}{a\arcsin(ax)} - \frac{35c^3\text{Si}(\arcsin(ax))}{64a} - \frac{63c^3\text{Si}(3\arcsin(ax))}{64a}$$
$$- \frac{35c^3\text{Si}(5\arcsin(ax))}{64a} - \frac{7c^3\text{Si}(7\arcsin(ax))}{64a}$$

Mathematica [A] (verified)

Time = 0.51 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.87

$$\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)^2}\,dx =$$
$$-\frac{c^3\left(64(1-a^2x^2)^{7/2} + 35\arcsin(ax)\text{Si}(\arcsin(ax)) + 63\arcsin(ax)\text{Si}(3\arcsin(ax)) + 35\arcsin(ax)\text{Si}(5\,\text{ar}\right.}{64a\arcsin(ax)}$$

```
[In] Integrate[(c - a^2*c*x^2)^3/ArcSin[a*x]^2,x]
```

```
[Out] -1/64*(c^3*(64*(1 - a^2*x^2)^(7/2) + 35*ArcSin[a*x]*SinIntegral[ArcSin[a*x]
] + 63*ArcSin[a*x]*SinIntegral[3*ArcSin[a*x]] + 35*ArcSin[a*x]*SinIntegral[
5*ArcSin[a*x]] + 7*ArcSin[a*x]*SinIntegral[7*ArcSin[a*x]]))/(a*ArcSin[a*x])
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.11

method	result
derivativedivides	$-\frac{c^3\left(35\ \text{Si}(\arcsin(ax))\arcsin(ax)+63\ \text{Si}(3\arcsin(ax))\arcsin(ax)+35\ \text{Si}(5\arcsin(ax))\arcsin(ax)+7\ \text{Si}(7\arcsin(ax))\,\text{arc}\right.}{64a\arcsin(ax)}$
default	$-\frac{c^3\left(35\ \text{Si}(\arcsin(ax))\arcsin(ax)+63\ \text{Si}(3\arcsin(ax))\arcsin(ax)+35\ \text{Si}(5\arcsin(ax))\arcsin(ax)+7\ \text{Si}(7\arcsin(ax))\,\text{arc}\right.}{64a\arcsin(ax)}$

```
[In] int((-a^2*c*x^2+c)^3/arcsin(a*x)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/64/a*c^3*(35*Si(arcsin(a*x))*arcsin(a*x)+63*Si(3*arcsin(a*x))*arcsin(a*x
)+35*Si(5*arcsin(a*x))*arcsin(a*x)+7*Si(7*arcsin(a*x))*arcsin(a*x)+35*(-a^2
*x^2+1)^(1/2)+7*cos(5*arcsin(a*x))+cos(7*arcsin(a*x))+21*cos(3*arcsin(a*x))
)/arcsin(a*x)
```

Fricas [F]

$$\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)^2} dx = \int -\frac{(a^2cx^2-c)^3}{\arcsin(ax)^2} dx$$

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(-(a^6*c^3*x^6 - 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 - c^3)/arcsin(a*x)^2
, x)
```

Sympy [F]

$$\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)^2} dx = -c^3\left(\int \frac{3a^2x^2}{\operatorname{asin}^2(ax)} dx + \int \left(-\frac{3a^4x^4}{\operatorname{asin}^2(ax)}\right) dx + \int \frac{a^6x^6}{\operatorname{asin}^2(ax)} dx + \int \left(-\frac{1}{\operatorname{asin}^2(ax)}\right) dx\right)$$

```
[In] integrate((-a**2*c*x**2+c)**3/asin(a*x)**2,x)
```

```
[Out] -c**3*(Integral(3*a**2*x**2/asin(a*x)**2, x) + Integral(-3*a**4*x**4/asin(a
*x)**2, x) + Integral(a**6*x**6/asin(a*x)**2, x) + Integral(-1/asin(a*x)**2
, x))
```

Maxima [F]

$$\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)^2} dx = \int -\frac{(a^2cx^2-c)^3}{\arcsin(ax)^2} dx$$

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))*integrate(7*(a^5*c^3*x^5 - 2
*a^3*c^3*x^3 + a*c^3*x)*sqrt(a*x + 1)*sqrt(-a*x + 1)/arctan2(a*x, sqrt(a*x
+ 1)*sqrt(-a*x + 1)), x) - (a^6*c^3*x^6 - 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 - c
^3)*sqrt(a*x + 1)*sqrt(-a*x + 1))/(a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x +
 1)))
```

Giac [A] (verification not implemented)

none

Time = 0.33 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.00

$$\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)^2}\,dx = \frac{(a^2x^2-1)^3\sqrt{-a^2x^2+1}c^3}{a\arcsin(ax)} - \frac{7\,c^3\,\mathrm{Si}\,(7\,\arcsin(ax))}{64\,a} - \frac{35\,c^3\,\mathrm{Si}\,(5\,\arcsin(ax))}{64\,a} - \frac{63\,c^3\,\mathrm{Si}\,(3\,\arcsin(ax))}{64\,a} - \frac{35\,c^3\,\mathrm{Si}\,(\arcsin(ax))}{64\,a}$$

```
[In] integrate((-a^2*c*x^2+c)^3/arcsin(a*x)^2,x, algorithm="giac")
[Out] (a^2*x^2 - 1)^3*sqrt(-a^2*x^2 + 1)*c^3/(a*arcsin(a*x)) - 7/64*c^3*sin_integ
ral(7*arcsin(a*x))/a - 35/64*c^3*sin_integral(5*arcsin(a*x))/a - 63/64*c^3*
sin_integral(3*arcsin(a*x))/a - 35/64*c^3*sin_integral(arcsin(a*x))/a
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(c-a^2cx^2)^3}{\arcsin(ax)^2}\,dx = \int \frac{(c-a^2\,c\,x^2)^3}{\mathrm{asin}\,(a\,x)^2}\,dx$$

```
[In] int((c - a^2*c*x^2)^3/asin(a*x)^2,x)
[Out] int((c - a^2*c*x^2)^3/asin(a*x)^2, x)
```

3.375 $\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)^2}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 78

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)^2}\,dx = -\frac{c^2(1-a^2x^2)^{5/2}}{a\arcsin(ax)} - \frac{5c^2\text{Si}(\arcsin(ax))}{8a} - \frac{15c^2\text{Si}(3\arcsin(ax))}{16a} - \frac{5c^2\text{Si}(5\arcsin(ax))}{16a}$$

```
[Out] -c^2*(-a^2*x^2+1)^(5/2)/a/arcsin(a*x)-5/8*c^2*Si(arcsin(a*x))/a-15/16*c^2*S
i(3*arcsin(a*x))/a-5/16*c^2*Si(5*arcsin(a*x))/a
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4751, 4809, 4491, 3380}

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)^2}\,dx = -\frac{c^2(1-a^2x^2)^{5/2}}{a\arcsin(ax)} - \frac{5c^2\text{Si}(\arcsin(ax))}{8a} - \frac{15c^2\text{Si}(3\arcsin(ax))}{16a} - \frac{5c^2\text{Si}(5\arcsin(ax))}{16a}$$

```
[In] Int[(c - a^2*c*x^2)^2/ArcSin[a*x]^2,x]
```

```
[Out] -((c^2*(1 - a^2*x^2)^(5/2))/(a*ArcSin[a*x])) - (5*c^2*SinIntegral[ArcSin[a*
x]])/(8*a) - (15*c^2*SinIntegral[3*ArcSin[a*x]])/(16*a) - (5*c^2*SinIntegra
l[5*ArcSin[a*x]])/(16*a)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule steps

$$
\begin{aligned}
\text{integral} &= -\frac{c^2(1-a^2x^2)^{5/2}}{a\arcsin(ax)} - (5ac^2)\int \frac{x(1-a^2x^2)^{3/2}}{\arcsin(ax)}\,dx \\
&= -\frac{c^2(1-a^2x^2)^{5/2}}{a\arcsin(ax)} - \frac{(5c^2)\,\text{Subst}\left(\int \frac{\cos^4(x)\sin(x)}{x}\,dx, x, \arcsin(ax)\right)}{a} \\
&= -\frac{c^2(1-a^2x^2)^{5/2}}{a\arcsin(ax)} - \frac{(5c^2)\,\text{Subst}\left(\int \left(\frac{\sin(x)}{8x}+\frac{3\sin(3x)}{16x}+\frac{\sin(5x)}{16x}\right)dx, x, \arcsin(ax)\right)}{a} \\
&= -\frac{c^2(1-a^2x^2)^{5/2}}{a\arcsin(ax)} - \frac{(5c^2)\,\text{Subst}\left(\int \frac{\sin(5x)}{x}\,dx, x, \arcsin(ax)\right)}{16a} \\
&\quad - \frac{(5c^2)\,\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \arcsin(ax)\right)}{8a} - \frac{(15c^2)\,\text{Subst}\left(\int \frac{\sin(3x)}{x}\,dx, x, \arcsin(ax)\right)}{16a} \\
&= -\frac{c^2(1-a^2x^2)^{5/2}}{a\arcsin(ax)} - \frac{5c^2\text{Si}(\arcsin(ax))}{8a} - \frac{15c^2\text{Si}(3\arcsin(ax))}{16a} - \frac{5c^2\text{Si}(5\arcsin(ax))}{16a}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 70, normalized size of antiderivative = 0.90

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)^2}\,dx = -\frac{c^2\Big(16(1-a^2x^2)^{5/2} + 10\arcsin(ax)\text{Si}(\arcsin(ax)) + 15\arcsin(ax)\text{Si}(3\arcsin(ax)) + 5\arcsin(ax)\text{Si}(5\arcsin(ax))\Big)}{16a\arcsin(ax)}$$

```
[In] Integrate[(c - a^2*c*x^2)^2/ArcSin[a*x]^2,x]
[Out] -1/16*(c^2*(16*(1 - a^2*x^2)^(5/2) + 10*ArcSin[a*x]*SinIntegral[ArcSin[a*x]
] + 15*ArcSin[a*x]*SinIntegral[3*ArcSin[a*x]] + 5*ArcSin[a*x]*SinIntegral[5
*ArcSin[a*x]]))/(a*ArcSin[a*x])
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.06

method	result
derivativedivides	$-\frac{c^2\left(10\ \text{Si}(\arcsin(ax))\arcsin(ax)+15\ \text{Si}(3\arcsin(ax))\arcsin(ax)+5\ \text{Si}(5\arcsin(ax))\arcsin(ax)+5\cos(3\arcsin(ax))+\cos(5\arcsin(ax))+10\sqrt{-a^2x^2+1}\right)}{16a\arcsin(ax)}$
default	$-\frac{c^2\left(10\ \text{Si}(\arcsin(ax))\arcsin(ax)+15\ \text{Si}(3\arcsin(ax))\arcsin(ax)+5\ \text{Si}(5\arcsin(ax))\arcsin(ax)+5\cos(3\arcsin(ax))+\cos(5\arcsin(ax))+10\sqrt{-a^2x^2+1}\right)}{16a\arcsin(ax)}$

```
[In] int((-a^2*c*x^2+c)^2/arcsin(a*x)^2,x,method=_RETURNVERBOSE)
[Out] -1/16/a*c^2*(10*Si(arcsin(a*x))*arcsin(a*x)+15*Si(3*arcsin(a*x))*arcsin(a*x
)+5*Si(5*arcsin(a*x))*arcsin(a*x)+5*cos(3*arcsin(a*x))+cos(5*arcsin(a*x))+1
0*(-a^2*x^2+1)^(1/2))/arcsin(a*x)
```

Fricas [F]

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)^2}\,dx = \int \frac{(a^2cx^2-c)^2}{\arcsin(ax)^2}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)/arcsin(a*x)^2, x)
```

Sympy [F]

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)^2}\,dx = c^2\left(\int \left(-\frac{2a^2x^2}{\operatorname{asin}^2(ax)}\right)dx + \int \frac{a^4x^4}{\operatorname{asin}^2(ax)}\,dx + \int \frac{1}{\operatorname{asin}^2(ax)}\,dx\right)$$

```
[In] integrate((-a**2*c*x**2+c)**2/asin(a*x)**2,x)
```

```
[Out] c**2*(Integral(-2*a**2*x**2/asin(a*x)**2, x) + Integral(a**4*x**4/asin(a*x)
**2, x) + Integral(asin(a*x)**(-2), x))
```

Maxima [F]

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)^2}\,dx = \int \frac{(a^2cx^2-c)^2}{\arcsin(ax)^2}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="maxima")
```

```
[Out] (a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))*integrate(5*(a^3*c^2*x^3 - a*
c^2*x)*sqrt(a*x + 1)*sqrt(-a*x + 1)/arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x +
1)), x) - (a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)*sqrt(a*x + 1)*sqrt(-a*x + 1))
/(a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1)))
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.04

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)^2}\,dx = -\frac{(a^2x^2-1)^2\sqrt{-a^2x^2+1}c^2}{a\arcsin(ax)} - \frac{5\,c^2\operatorname{Si}(5\,\arcsin(ax))}{16\,a} - \frac{15\,c^2\operatorname{Si}(3\,\arcsin(ax))}{16\,a} - \frac{5\,c^2\operatorname{Si}(\arcsin(ax))}{8\,a}$$

```
[In] integrate((-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="giac")
```

```
[Out] -(a^2*x^2 - 1)^2*sqrt(-a^2*x^2 + 1)*c^2/(a*arcsin(a*x)) - 5/16*c^2*sin_inte
gral(5*arcsin(a*x))/a - 15/16*c^2*sin_integral(3*arcsin(a*x))/a - 5/8*c^2*s
in_integral(arcsin(a*x))/a
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(c-a^2cx^2)^2}{\arcsin(ax)^2}\,dx = \int \frac{{\left(c-a^2\,c\,x^2\right)}^2}{{\mathrm{asin}\left(a\,x\right)}^2}\,dx$$

```
[In] int((c - a^2*c*x^2)^2/asin(a*x)^2,x)
[Out] int((c - a^2*c*x^2)^2/asin(a*x)^2, x)
```

3.376 $\int \frac{c-a^2cx^2}{\arcsin(ax)^2}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 55

$$\int \frac{c-a^2cx^2}{\arcsin(ax)^2}\,dx = -\frac{c(1-a^2x^2)^{3/2}}{a\arcsin(ax)} - \frac{3c\mathrm{Si}(\arcsin(ax))}{4a} - \frac{3c\mathrm{Si}(3\arcsin(ax))}{4a}$$

```
[Out] -c*(-a^2*x^2+1)^(3/2)/a/arcsin(a*x)-3/4*c*Si(arcsin(a*x))/a-3/4*c*Si(3*arcs
in(a*x))/a
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4751, 4809, 4491, 3380}

$$\int \frac{c-a^2cx^2}{\arcsin(ax)^2}\,dx = -\frac{c(1-a^2x^2)^{3/2}}{a\arcsin(ax)} - \frac{3c\mathrm{Si}(\arcsin(ax))}{4a} - \frac{3c\mathrm{Si}(3\arcsin(ax))}{4a}$$

```
[In] Int[(c - a^2*c*x^2)/ArcSin[a*x]^2,x]
```

```
[Out] -((c*(1 - a^2*x^2)^(3/2))/(a*ArcSin[a*x])) - (3*c*SinIntegral[ArcSin[a*x]])
/(4*a) - (3*c*SinIntegral[3*ArcSin[a*x]])/(4*a)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
```

```
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{c(1-a^2x^2)^{3/2}}{a\arcsin(ax)} - (3ac)\int \frac{x\sqrt{1-a^2x^2}}{\arcsin(ax)}\,dx \\
&= -\frac{c(1-a^2x^2)^{3/2}}{a\arcsin(ax)} - \frac{(3c)\text{Subst}\left(\int \frac{\cos^2(x)\sin(x)}{x}\,dx, x, \arcsin(ax)\right)}{a} \\
&= -\frac{c(1-a^2x^2)^{3/2}}{a\arcsin(ax)} - \frac{(3c)\text{Subst}\left(\int \left(\frac{\sin(x)}{4x} + \frac{\sin(3x)}{4x}\right)\,dx, x, \arcsin(ax)\right)}{a} \\
&= -\frac{c(1-a^2x^2)^{3/2}}{a\arcsin(ax)} - \frac{(3c)\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \arcsin(ax)\right)}{4a} \\
&\quad - \frac{(3c)\text{Subst}\left(\int \frac{\sin(3x)}{x}\,dx, x, \arcsin(ax)\right)}{4a} \\
&= -\frac{c(1-a^2x^2)^{3/2}}{a\arcsin(ax)} - \frac{3c\text{Si}(\arcsin(ax))}{4a} - \frac{3c\text{Si}(3\arcsin(ax))}{4a}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.00

$$\int \frac{c-a^2cx^2}{\arcsin(ax)^2}\,dx = -\frac{c\left(4(1-a^2x^2)^{3/2}+3\arcsin(ax)\mathrm{Si}(\arcsin(ax))+3\arcsin(ax)\mathrm{Si}(3\arcsin(ax))\right)}{4a\arcsin(ax)}$$

```
[In] Integrate[(c - a^2*c*x^2)/ArcSin[a*x]^2,x]
[Out] -1/4*(c*(4*(1 - a^2*x^2)^(3/2) + 3*ArcSin[a*x]*SinIntegral[ArcSin[a*x]] + 3
*ArcSin[a*x]*SinIntegral[3*ArcSin[a*x]]))/(a*ArcSin[a*x])
```

Maple [A] (verified)

Time = 0.04 (sec) , antiderivative size = 59, normalized size of antiderivative = 1.07

method	result	size
derivativedivides	$-\frac{c\left(3\ \mathrm{Si}(\arcsin(ax))\arcsin(ax)+3\ \mathrm{Si}(3\arcsin(ax))\arcsin(ax)+\cos(3\arcsin(ax))+3\sqrt{-a^2x^2+1}\right)}{4a\arcsin(ax)}$	59
default	$-\frac{c\left(3\ \mathrm{Si}(\arcsin(ax))\arcsin(ax)+3\ \mathrm{Si}(3\arcsin(ax))\arcsin(ax)+\cos(3\arcsin(ax))+3\sqrt{-a^2x^2+1}\right)}{4a\arcsin(ax)}$	59

```
[In] int((-a^2*c*x^2+c)/arcsin(a*x)^2,x,method=_RETURNVERBOSE)
[Out] -1/4/a*c*(3*Si(arcsin(a*x))*arcsin(a*x)+3*Si(3*arcsin(a*x))*arcsin(a*x)+cos
(3*arcsin(a*x))+3*(-a^2*x^2+1)^(1/2))/arcsin(a*x)
```

Fricas [F]

$$\int \frac{c-a^2cx^2}{\arcsin(ax)^2}\,dx = \int -\frac{a^2cx^2-c}{\arcsin\left(ax\right)^2}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="fricas")
[Out] integral(-(a^2*c*x^2 - c)/arcsin(a*x)^2, x)
```

Sympy [F]

$$\int \frac{c - a^2cx^2}{\arcsin(ax)^2}\,dx = -c\left(\int \frac{a^2x^2}{\operatorname{asin}^2(ax)}\,dx + \int \left(-\frac{1}{\operatorname{asin}^2(ax)}\right)dx\right)$$

```
[In] integrate((-a**2*c*x**2+c)/asin(a*x)**2,x)
[Out] -c*(Integral(a**2*x**2/asin(a*x)**2, x) + Integral(-1/asin(a*x)**2, x))
```

Maxima [F]

$$\int \frac{c - a^2cx^2}{\arcsin(ax)^2}\,dx = \int -\frac{a^2cx^2 - c}{\arcsin(ax)^2}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="maxima")
[Out] -(3*a^2*c*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))*integrate(sqrt(a*x + 1
)*sqrt(-a*x + 1)*x/arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1)), x) - (a^2*c*
x^2 - c)*sqrt(a*x + 1)*sqrt(-a*x + 1))/(a*arctan2(a*x, sqrt(a*x + 1)*sqrt(-
a*x + 1)))
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.89

$$\int \frac{c - a^2cx^2}{\arcsin(ax)^2}\,dx = -\frac{3\,c\,\mathrm{Si}\,(3\,\arcsin(ax))}{4\,a} - \frac{3\,c\,\mathrm{Si}\,(\arcsin(ax))}{4\,a} - \frac{(-a^2x^2+1)^{\frac{3}{2}}c}{a\arcsin(ax)}$$

```
[In] integrate((-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="giac")
[Out] -3/4*c*sin_integral(3*arcsin(a*x))/a - 3/4*c*sin_integral(arcsin(a*x))/a -
(-a^2*x^2 + 1)^(3/2)*c/(a*arcsin(a*x))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{c - a^2cx^2}{\arcsin(ax)^2} \, dx = \int \frac{c - a^2\,c\,x^2}{\mathrm{asin}\left(a\,x\right)^2} \, dx$$

```
[In] int((c - a^2*c*x^2)/asin(a*x)^2,x)
[Out] int((c - a^2*c*x^2)/asin(a*x)^2, x)
```

3.377 $\int \frac{1}{(c-a^2cx^2)\arcsin(ax)^2}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 20

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)^2}\,dx = -\frac{1}{ac\sqrt{1-a^2x^2}\arcsin(ax)}+\frac{a\mathrm{Int}\left(\frac{x}{(1-a^2x^2)^{3/2}\arcsin(ax)},x\right)}{c}$$

```
[Out] -1/a/c/arcsin(a*x)/(-a^2*x^2+1)^(1/2)+a*Unintegrable(x/(-a^2*x^2+1)^(3/2)/a
rcsin(a*x),x)/c
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)^2}\,dx = \int \frac{1}{(c-a^2cx^2)\arcsin(ax)^2}\,dx$$

```
[In] Int[1/((c - a^2*c*x^2)*ArcSin[a*x]^2),x]
```

```
[Out] -(1/(a*c*Sqrt[1 - a^2*x^2]*ArcSin[a*x])) + (a*Defer[Int][x/((1 - a^2*x^2)^(
3/2)*ArcSin[a*x]), x])/c
```

Rubi steps

$$\text{integral} = -\frac{1}{ac\sqrt{1-a^2x^2}\arcsin(ax)}+\frac{a\int \frac{x}{(1-a^2x^2)^{3/2}\arcsin(ax)}\,dx}{c}$$

Mathematica [N/A]

Not integrable

Time = 4.27 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)^2}\,dx = \int \frac{1}{(c-a^2cx^2)\arcsin(ax)^2}\,dx$$

```
[In] Integrate[1/((c - a^2*c*x^2)*ArcSin[a*x]^2),x]
[Out] Integrate[1/((c - a^2*c*x^2)*ArcSin[a*x]^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.27 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00

$$\int \frac{1}{(-a^2c\,x^2+c)\arcsin\left(ax\right)^2}dx$$

```
[In] int(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x)
[Out] int(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.20

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)^2}\,dx = \int -\frac{1}{(a^2cx^2-c)\arcsin\left(ax\right)^2}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="fricas")
[Out] integral(-1/((a^2*c*x^2 - c)*arcsin(a*x)^2), x)
```

Sympy [N/A]

Not integrable

Time = 0.93 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.30

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)^2}\,dx = -\frac{\int \frac{1}{a^2x^2\operatorname{asin}^2(ax)-\operatorname{asin}^2(ax)}\,dx}{c}$$

```
[In] integrate(1/(-a**2*c*x**2+c)/asin(a*x)**2,x)
[Out] -Integral(1/(a**2*x**2*asin(a*x)**2 - asin(a*x)**2), x)/c
```

Maxima [N/A]

Not integrable

Time = 0.61 (sec) , antiderivative size = 153, normalized size of antiderivative = 7.65

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)^2}\,dx = \int -\frac{1}{(a^2cx^2-c)\arcsin{(ax)}^2}\,dx$$

[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="maxima")

[Out] ((a^4*c*x^2 - a^2*c)*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))*integrate(s
qrt(a*x + 1)*sqrt(-a*x + 1)*x/((a^4*c*x^4 - 2*a^2*c*x^2 + c)*arctan2(a*x, s
qrt(a*x + 1)*sqrt(-a*x + 1))), x) + sqrt(a*x + 1)*sqrt(-a*x + 1))/((a^3*c*x
^2 - a*c)*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1)))

Giac [N/A]

Not integrable

Time = 0.51 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.20

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)^2}\,dx = \int -\frac{1}{(a^2cx^2-c)\arcsin{(ax)}^2}\,dx$$

[In] integrate(1/(-a^2*c*x^2+c)/arcsin(a*x)^2,x, algorithm="giac")

[Out] integrate(-1/((a^2*c*x^2 - c)*arcsin(a*x)^2), x)

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(c-a^2cx^2)\arcsin(ax)^2}\,dx = \int \frac{1}{\mathrm{asin}{(a\,x)}^2\,(c-a^2\,c\,x^2)}\,dx$$

[In] int(1/(asin(a*x)^2*(c - a^2*c*x^2)),x)

[Out] int(1/(asin(a*x)^2*(c - a^2*c*x^2)), x)

3.378 $\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)^2} \, dx$

Optimal result

Integrand size = 20, antiderivative size = 20

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)^2} \, dx = -\frac{1}{ac^2 (1-a^2x^2)^{3/2} \arcsin(ax)} + \frac{3a\text{Int}\left(\frac{x}{(1-a^2x^2)^{5/2} \arcsin(ax)}, x\right)}{c^2}$$

```
[Out] -1/a/c^2/(-a^2*x^2+1)^(3/2)/arcsin(a*x)+3*a*Unintegrable(x/(-a^2*x^2+1)^(5/
2)/arcsin(a*x),x)/c^2
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)^2} \, dx = \int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)^2} \, dx$$

```
[In] Int[1/((c - a^2*c*x^2)^2*ArcSin[a*x]^2),x]
```

```
[Out] -(1/(a*c^2*(1 - a^2*x^2)^(3/2)*ArcSin[a*x])) + (3*a*Defer[Int][x/((1 - a^2*
x^2)^(5/2)*ArcSin[a*x]), x])/c^2
```

Rubi steps

$$\text{integral} = -\frac{1}{ac^2 (1-a^2x^2)^{3/2} \arcsin(ax)} + \frac{(3a) \int \frac{x}{(1-a^2x^2)^{5/2} \arcsin(ax)} \, dx}{c^2}$$

Mathematica [N/A]

Not integrable

Time = 13.43 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)^2}\,dx = \int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)^2}\,dx$$

```
[In] Integrate[1/((c - a^2*c*x^2)^2*ArcSin[a*x]^2),x]
[Out] Integrate[1/((c - a^2*c*x^2)^2*ArcSin[a*x]^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.49 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00

$$\int \frac{1}{\left(-a^2c\,x^2+c\right)^2 \arcsin\left(ax\right)^2}dx$$

```
[In] int(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x)
[Out] int(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.80

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)^2}\,dx = \int \frac{1}{\left(a^2cx^2-c\right)^2 \arcsin\left(ax\right)^2}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="fricas")
[Out] integral(1/((a^4*c^2*x^4 - 2*a^2*c^2*x^2 + c^2)*arcsin(a*x)^2), x)
```

Sympy [N/A]

Not integrable

Time = 1.60 (sec) , antiderivative size = 41, normalized size of antiderivative = 2.05

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)^2}\,dx = \frac{\int \frac{1}{a^4x^4\operatorname{asin}^2(ax)-2a^2x^2\operatorname{asin}^2(ax)+\operatorname{asin}^2(ax)}\,dx}{c^2}$$

```
[In] integrate(1/(-a**2*c*x**2+c)**2/asin(a*x)**2,x)
[Out] Integral(1/(a**4*x**4*asin(a*x)**2 - 2*a**2*x**2*asin(a*x)**2 + asin(a*x)**
2), x)/c**2
```

Maxima [N/A]

Not integrable

Time = 0.67 (sec) , antiderivative size = 202, normalized size of antiderivative = 10.10

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)^2}\,dx = \int \frac{1}{(a^2cx^2-c)^2 \arcsin{(ax)}^2}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(3*(a^6*c^2*x^4 - 2*a^4*c^2*x^2 + a^2*c^2)*arctan2(a*x, sqrt(a*x + 1)*sqrt
(-a*x + 1))*integrate(sqrt(a*x + 1)*sqrt(-a*x + 1)*x/((a^6*c^2*x^6 - 3*a^4*
c^2*x^4 + 3*a^2*c^2*x^2 - c^2)*arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1))),
 x) + sqrt(a*x + 1)*sqrt(-a*x + 1))/((a^5*c^2*x^4 - 2*a^3*c^2*x^2 + a*c^2)*
arctan2(a*x, sqrt(a*x + 1)*sqrt(-a*x + 1)))
```

Giac [N/A]

Not integrable

Time = 1.38 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.15

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)^2}\,dx = \int \frac{1}{(a^2cx^2-c)^2 \arcsin{(ax)}^2}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^2/arcsin(a*x)^2,x, algorithm="giac")
```

```
[Out] integrate(1/((a^2*c*x^2 - c)^2*arcsin(a*x)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(c-a^2cx^2)^2 \arcsin(ax)^2}\,dx = \int \frac{1}{\mathrm{asin}\left(a\,x\right)^2\,{\left(c-a^2\,c\,x^2\right)}^2}\,dx$$

```
[In] int(1/(asin(a*x)^2*(c - a^2*c*x^2)^2),x)
```

```
[Out] int(1/(asin(a*x)^2*(c - a^2*c*x^2)^2), x)
```

3.379 $\int \left(\frac{1}{(1-x^2)\arcsin(x)^2}-\frac{x}{(1-x^2)^{3/2}\arcsin(x)}\right)dx$

Optimal result

Integrand size = 33, antiderivative size = 17

$$\int \left(\frac{1}{(1-x^2)\arcsin(x)^2}-\frac{x}{(1-x^2)^{3/2}\arcsin(x)}\right)dx=-\frac{1}{\sqrt{1-x^2}\arcsin(x)}$$

```
[Out] -1/arcsin(x)/(-x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.030, Rules used = {4751}

$$\int \left(\frac{1}{(1-x^2)\arcsin(x)^2}-\frac{x}{(1-x^2)^{3/2}\arcsin(x)}\right)dx=-\frac{1}{\sqrt{1-x^2}\arcsin(x)}$$

```
[In] Int[1/((1 - x^2)*ArcSin[x]^2) - x/((1 - x^2)^(3/2)*ArcSin[x]),x]
```

```
[Out] -(1/(Sqrt[1 - x^2]*ArcSin[x]))
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \frac{1}{(1-x^2)\arcsin(x)^2}\,dx - \int \frac{x}{(1-x^2)^{3/2}\arcsin(x)}\,dx \\
&= -\frac{1}{\sqrt{1-x^2}\arcsin(x)}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.00

$$\int \left(\frac{1}{(1-x^2)\arcsin(x)^2} - \frac{x}{(1-x^2)^{3/2}\arcsin(x)}\right) dx = -\frac{1}{\sqrt{1-x^2}\arcsin(x)}$$

```
[In] Integrate[1/((1 - x^2)*ArcSin[x]^2) - x/((1 - x^2)^(3/2)*ArcSin[x]),x]
[Out] -(1/(Sqrt[1 - x^2]*ArcSin[x]))
```

Maple [F]

$$\int \left(\frac{1}{(-x^2+1)\arcsin(x)^2} - \frac{x}{(-x^2+1)^{\frac{3}{2}}\arcsin(x)}\right) dx$$

```
[In] int(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x)
[Out] int(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 21, normalized size of antiderivative = 1.24

$$\int \left(\frac{1}{(1-x^2)\arcsin(x)^2} - \frac{x}{(1-x^2)^{3/2}\arcsin(x)}\right) dx = \frac{\sqrt{-x^2+1}}{(x^2-1)\arcsin(x)}$$

```
[In] integrate(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x, algorithm="f
ricas")
[Out] sqrt(-x^2 + 1)/((x^2 - 1)*arcsin(x))
```

Sympy [F]

$$\int \left(\frac{1}{(1-x^2)\arcsin(x)^2} - \frac{x}{(1-x^2)^{3/2}\arcsin(x)}\right) dx = \int \frac{(x-1)(x+1)\left(x\operatorname{asin}(x)-\sqrt{1-x^2}\right)}{\left(-(x-1)(x+1)\right)^{\frac{5}{2}}\operatorname{asin}^2(x)}\, dx$$

```
[In] integrate(1/(-x**2+1)/asin(x)**2-x/(-x**2+1)**(3/2)/asin(x),x)
[Out] Integral((x - 1)*(x + 1)*(x*asin(x) - sqrt(1 - x**2))/((-(x - 1)*(x + 1))**
(5/2)*asin(x)**2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 37 vs. $2(15) = 30$.

Time = 0.64 (sec) , antiderivative size = 37, normalized size of antiderivative = 2.18

$$\int \left(\frac{1}{(1-x^2)\arcsin(x)^2} - \frac{x}{(1-x^2)^{3/2}\arcsin(x)}\right) dx = \frac{\sqrt{x+1}\sqrt{-x+1}}{(x^2-1)\arctan\left(x, \sqrt{x+1}\sqrt{-x+1}\right)}$$

```
[In] integrate(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x, algorithm="m
axima")
[Out] sqrt(x + 1)*sqrt(-x + 1)/((x^2 - 1)*arctan2(x, sqrt(x + 1)*sqrt(-x + 1)))
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 70 vs. $2(15) = 30$.

Time = 0.36 (sec) , antiderivative size = 70, normalized size of antiderivative = 4.12

$$\int \left(\frac{1}{(1-x^2)\arcsin(x)^2} - \frac{x}{(1-x^2)^{3/2}\arcsin(x)}\right) dx = \frac{1}{\frac{x^2\arcsin(x)}{\left(\sqrt{-x^2+1}+1\right)^2} - \arcsin(x)} + \frac{x^2}{\left(\frac{x^2\arcsin(x)}{\left(\sqrt{-x^2+1}+1\right)^2} - \arcsin(x)\right)\left(\sqrt{-x^2+1}+1\right)^2}$$

```
[In] integrate(1/(-x^2+1)/arcsin(x)^2-x/(-x^2+1)^(3/2)/arcsin(x),x, algorithm="g
iac")
[Out] 1/(x^2*arcsin(x)/(sqrt(-x^2 + 1) + 1)^2 - arcsin(x)) + x^2/((x^2*arcsin(x)/
(sqrt(-x^2 + 1) + 1)^2 - arcsin(x))*(sqrt(-x^2 + 1) + 1)^2)
```

Mupad [F(-1)]

Timed out.

$$\int \left(\frac{1}{(1-x^2)\arcsin(x)^2}-\frac{x}{(1-x^2)^{3/2}\arcsin(x)}\right)\,dx = -\int \frac{1}{\mathrm{asin}\,(x)^2\,\left(x^2-1\right)}+\frac{x}{\mathrm{asin}\,(x)\,\left(1-x^2\right)^{3/2}}\,dx$$

```
[In] int(- 1/(asin(x)^2*(x^2 - 1)) - x/(asin(x)*(1 - x^2)^(3/2)),x)
[Out] -int(1/(asin(x)^2*(x^2 - 1)) + x/(asin(x)*(1 - x^2)^(3/2)), x)
```

3.380 $\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx=\text{Int}\left(\frac{x^m\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.08 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
[Out] Defer[Int][(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\text{integral}=\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.63 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[(x^m*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.85 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^m\sqrt{-c^2x^2+1}}{\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.50

$$\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{\sqrt{-c^2x^2+1}\,x^m}{\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^m/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^
2), x)
```

Sympy [N/A]

Not integrable

Time = 1.63 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x^m\sqrt{-(cx-1)(cx+1)}}{(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate(x**m*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(x**m*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Maxima [N/A]

Not integrable

Time = 1.33 (sec) , antiderivative size = 138, normalized size of antiderivative = 4.93

$$\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}\,x^m}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] ((c^2*x^2 - 1)*x^m - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*
b*c)*integrate(((c^2*m + 2*c^2)*x^2 - m)*x^m/(b^2*c*x*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)) + a*b*c*x), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1)) + a*b*c)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m\,\sqrt{1-c^2\,x^2}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

```
[In] int((x^m*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2,x)
[Out] int((x^m*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2, x)
```

3.381 $\int \frac{x^3\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 214

$$\int \frac{x^3\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = -\frac{x^3(1-c^2x^2)}{bc(a+b\arcsin(cx))}+\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^4}+\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^4}-\frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^4}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^4}+\frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^4}-\frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^4}$$

```
[Out] -x^3*(-c^2*x^2+1)/b/c/(a+b*arcsin(c*x))+1/8*Ci((a+b*arcsin(c*x))/b)*cos(a/b
)/b^2/c^4+3/16*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^4-5/16*Ci(5*(a+b*
arcsin(c*x))/b)*cos(5*a/b)/b^2/c^4+1/8*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2
/c^4+3/16*Si(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^4-5/16*Si(5*(a+b*arcsi
n(c*x))/b)*sin(5*a/b)/b^2/c^4
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {4799, 4731, 4491, 3384, 3380, 3383}

$$\int \frac{x^3\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^4} + \frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^4} - \frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^4} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^4} + \frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^4} - \frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^4} - \frac{x^3(1-c^2x^2)}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(x^3*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^3*(1 - c^2*x^2))/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[(a
 + b*ArcSin[c*x])/b])/(8*b^2*c^4) + (3*Cos[(3*a)/b]*CosIntegral[(3*(a + b*A
rcSin[c*x]))/b])/(16*b^2*c^4) - (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSi
n[c*x]))/b])/(16*b^2*c^4) + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(
8*b^2*c^4) + (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(16*b^
2*c^4) - (5*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b^2*c^
4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
```

```
NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^3(1-c^2x^2)}{bc(a+b\arcsin(cx))}+\frac{3\int \frac{x^2}{a+b\arcsin(cx)}\,dx}{bc}-\frac{(5c)\int \frac{x^4}{a+b\arcsin(cx)}\,dx}{b}\\
&= -\frac{x^3(1-c^2x^2)}{bc(a+b\arcsin(cx))}+\frac{3\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^4}\\
&\quad-\frac{5\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^4}\\
&= -\frac{x^3(1-c^2x^2)}{bc(a+b\arcsin(cx))}+\frac{3\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)\,dx,x,a+b\arcsin(cx)\right)}{b^2c^4}\\
&\quad-\frac{5\text{Subst}\left(\int \left(\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x}-\frac{3\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right)\,dx,x,a+b\arcsin(cx)\right)}{b^2c^4}
\end{aligned}$$

$$= -\frac{x^3(1-c^2x^2)}{bc(a+b\arcsin(cx))} - \frac{5\text{Subst}\left(\int \frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^4} - \frac{5\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^4} - \frac{3\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^4} + \frac{3\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^4} + \frac{15\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^4}$$

$$= -\frac{x^3(1-c^2x^2)}{bc(a+b\arcsin(cx))} - \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^4} + \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^4} - \frac{\left(3\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^4} + \frac{\left(15\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^4} - \frac{\left(5\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^4} - \frac{\left(5\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^4} + \frac{\left(3\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^4} - \frac{\left(3\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^4} + \frac{\left(15\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^4} - \frac{\left(5\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^4}$$

$$= -\frac{x^3(1-c^2x^2)}{bc(a+b\arcsin(cx))} + \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^4} + \frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^4} - \frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^4} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^4} + \frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^4} - \frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^4}$$

Mathematica [A] (verified)

Time = 0.42 (sec) , antiderivative size = 175, normalized size of antiderivative = 0.82

$$\int \frac{x^3\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \frac{-\frac{16bc^3x^3}{a+b\arcsin(cx)} + \frac{16bc^5x^5}{a+b\arcsin(cx)} + 2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right) + 3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{arcs}\right.\right.}{}$$

```
[In] Integrate[(x^3*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] ((-16*b*c^3*x^3)/(a + b*ArcSin[c*x]) + (16*b*c^5*x^5)/(a + b*ArcSin[c*x]) +
 2*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + 3*Cos[(3*a)/b]*CosIntegral[3*(
a/b + ArcSin[c*x])] - 5*Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c*x])] + 2
*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 3*Sin[(3*a)/b]*SinIntegral[3*(a/
b + ArcSin[c*x])] - 5*Sin[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*
b^2*c^4)
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 340, normalized size of antiderivative = 1.59

method	result
default	$-\frac{5\arcsin(cx)\,\text{Si}\left(5\arcsin(cx)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)b+5\arcsin(cx)\,\text{Ci}\left(5\arcsin(cx)+\frac{5a}{b}\right)\cos\left(\frac{5a}{b}\right)b-2\arcsin(cx)\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b-2}{}$

```
[In] int(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/16/c^4*(5*arcsin(c*x)*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*b+5*arcsin(c*x)
*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b-2*arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin
(a/b)*b-2*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b-3*arcsin(c*x)*Si(3*arc
sin(c*x)+3*a/b)*sin(3*a/b)*b-3*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/
b)*b+5*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*a+5*Ci(5*arcsin(c*x)+5*a/b)*cos(5
```

```
*a/b)*a-2*Si(arcsin(c*x)+a/b)*sin(a/b)*a-2*Ci(arcsin(c*x)+a/b)*cos(a/b)*a-3
*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a-3*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*
a+2*x*b*c-sin(5*arcsin(c*x))*b+sin(3*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2
```

Fricas [F]

$$\int \frac{x^3\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}x^3}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^3/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^
2), x)
```

Sympy [F]

$$\int \frac{x^3\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3\sqrt{-(cx-1)(cx+1)}}{(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate(x**3*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(x**3*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \frac{x^3\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}x^3}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (c^2*x^5 - x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
*integrate((5*c^2*x^4 - 3*x^2)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
+ 1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b
*c)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3\,\sqrt{1-c^2\,x^2}}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}\,dx$$

```
[In] int((x^3*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2,x)
```

```
[Out] int((x^3*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2, x)
```

3.382 $\int \frac{x^2\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 94

$$\int \frac{x^2\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = -\frac{x^2(1-c^2x^2)}{bc(a+b\arcsin(cx))} - \frac{\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{2b^2c^3} + \frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{2b^2c^3}$$

```
[Out] -x^2*(-c^2*x^2+1)/b/c/(a+b*arcsin(c*x))+1/2*cos(4*a/b)*Si(4*(a+b*arcsin(c*x
))/b)/b^2/c^3-1/2*Ci(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b^2/c^3
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {4799, 4731, 4491, 12, 3384, 3380, 3383}

$$\int \frac{x^2\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = -\frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{2b^2c^3} + \frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{2b^2c^3} - \frac{x^2(1-c^2x^2)}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(x^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^2*(1 - c^2*x^2))/(b*c*(a + b*ArcSin[c*x]))) - (CosIntegral[(4*(a + b*A
rcSin[c*x]))/b]*Sin[(4*a)/b])/(2*b^2*c^3) + (Cos[(4*a)/b]*SinIntegral[(4*(a
 + b*ArcSin[c*x]))/b])/(2*b^2*c^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
```

```
0] && IGtQ[m, -3]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^2(1-c^2x^2)}{bc(a+b\arcsin(cx))}+\frac{2\int\frac{x}{a+b\arcsin(cx)}\,dx}{bc}-\frac{(4c)\int\frac{x^3}{a+b\arcsin(cx)}\,dx}{b}\\
&= -\frac{x^2(1-c^2x^2)}{bc(a+b\arcsin(cx))}-\frac{2\text{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3}\\
&\quad+\frac{4\text{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3}\\
&= -\frac{x^2(1-c^2x^2)}{bc(a+b\arcsin(cx))}-\frac{2\text{Subst}\left(\int\frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3}\\
&\quad+\frac{4\text{Subst}\left(\int\left(-\frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8x}+\frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{4x}\right)\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3}\\
&= -\frac{x^2(1-c^2x^2)}{bc(a+b\arcsin(cx))}-\frac{\text{Subst}\left(\int\frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3}\\
&= -\frac{x^2(1-c^2x^2)}{bc(a+b\arcsin(cx))}+\frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int\frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3}\\
&\quad-\frac{\sin\left(\frac{4a}{b}\right)\text{Subst}\left(\int\frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3}\\
&= -\frac{x^2(1-c^2x^2)}{bc(a+b\arcsin(cx))}-\frac{\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{2b^2c^3}+\frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{2b^2c^3}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.87

$$\int\frac{x^2\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx=\frac{\frac{2bc^2x^2(-1+c^2x^2)}{a+b\arcsin(cx)}-\text{CosIntegral}\left(4\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{4a}{b}\right)+\cos\left(\frac{4a}{b}\right)\text{Si}\left(4\left(\frac{a}{b}+\arcsin(cx)\right)\right)}{2b^2c^3}$$

```
[In] Integrate[(x^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
[Out] ((2*b*c^2*x^2*(-1 + c^2*x^2))/(a + b*ArcSin[c*x]) - CosIntegral[4*(a/b + Ar
cSin[c*x])]*Sin[(4*a)/b] + Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])])
/(2*b^2*c^3)
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.45

method	result
default	$\frac{4\arcsin(cx)\,\mathrm{Si}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)b-4\arcsin(cx)\,\mathrm{Ci}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)b+4\,\mathrm{Si}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)a-4\,\mathrm{Ci}\left(4\arc\right.}{8c^3(a+b\arcsin(cx))b^2}$

```
[In] int(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
[Out] 1/8/c^3*(4*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-4*arcsin(c*x)*C
i(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b+4*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*a-
4*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*a+cos(4*arcsin(c*x))*b-b)/(a+b*arcsin(
c*x))/b^2
```

Fricas [F]

$$\int \frac{x^2\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{\sqrt{-c^2x^2+1}x^2}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^2/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^
2), x)
```

Sympy [F]

$$\int \frac{x^2\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{x^2\sqrt{-(cx-1)(cx+1)}}{(a+b\,\mathrm{asin}(cx))^2}\,dx$$

```
[In] integrate(x**2*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(x**2*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \frac{x^2\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{\sqrt{-c^2x^2+1}x^2}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (c^2*x^4 - x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
*integrate(2*(2*c^2*x^3 - x)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c
)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 563 vs. $2(88) = 176$.

Time = 0.41 (sec) , antiderivative size = 563, normalized size of antiderivative = 5.99

$$\int \frac{x^2\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = -\frac{4\,b\arcsin(cx)\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{4\,a}{b}+4\,\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c^3\arcsin(cx)+ab^2c^3} + \frac{4\,b\arcsin(cx)\cos\left(\frac{a}{b}\right)^4\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin(cx)\right)}{b^3c^3\arcsin(cx)+ab^2c^3} - \frac{4\,a\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{4\,a}{b}+4\,\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c^3\arcsin(cx)+ab^2c^3} + \frac{4\,a\cos\left(\frac{a}{b}\right)^4\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin(cx)\right)}{b^3c^3\arcsin(cx)+ab^2c^3} + \frac{2\,b\arcsin(cx)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{4\,a}{b}+4\,\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c^3\arcsin(cx)+ab^2c^3} - \frac{4\,b\arcsin(cx)\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin(cx)\right)}{b^3c^3\arcsin(cx)+ab^2c^3} + \frac{2\,a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{4\,a}{b}+4\,\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c^3\arcsin(cx)+ab^2c^3} - \frac{4\,a\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin(cx)\right)}{b^3c^3\arcsin(cx)+ab^2c^3} + \frac{(c^2x^2-1)^2b}{b^3c^3\arcsin(cx)+ab^2c^3} + \frac{b\arcsin(cx)\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin(cx)\right)}{2\,(b^3c^3\arcsin(cx)+ab^2c^3)} + \frac{(c^2x^2-1)b}{b^3c^3\arcsin(cx)+ab^2c^3} + \frac{a\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin(cx)\right)}{2\,(b^3c^3\arcsin(cx)+ab^2c^3)}$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -4*b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b
^3*c^3*arcsin(c*x) + a*b^2*c^3) + 4*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4
*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 4*a*cos(a/b)^3*co
s_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3
) + 4*a*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x)
 + a*b^2*c^3) + 2*b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x)
)*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 4*b*arcsin(c*x)*cos(a/b)^2*s
in_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 2*a*
cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x)
+ a*b^2*c^3) - 4*a*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*
arcsin(c*x) + a*b^2*c^3) + (c^2*x^2 - 1)^2*b/(b^3*c^3*arcsin(c*x) + a*b^2*c
^3) + 1/2*b*arcsin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin
(c*x) + a*b^2*c^3) + (c^2*x^2 - 1)*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/
2*a*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2\,\sqrt{1-c^2\,x^2}}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}\,dx$$

```
[In] int((x^2*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2,x)
[Out] int((x^2*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2, x)
```

3.383 $\int \frac{x\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 150

$$\int \frac{x\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = -\frac{x(1-c^2x^2)}{bc(a+b\arcsin(cx))}+\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^2}+\frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^2}+\frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^2}$$

```
[Out] -x*(-c^2*x^2+1)/b/c/(a+b*arcsin(c*x))+1/4*Ci((a+b*arcsin(c*x))/b)*cos(a/b)/
b^2/c^2+3/4*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^2+1/4*Si((a+b*arcsin
(c*x))/b)*sin(a/b)/b^2/c^2+3/4*Si(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^2
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.269$, Rules used = {4799, 4719, 3384, 3380, 3383, 4731, 4491}

$$\int \frac{x\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^2} + \frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^2} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^2} + \frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^2} - \frac{x(1-c^2x^2)}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(x*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x*(1 - c^2*x^2))/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[(a +
 b*ArcSin[c*x])/b])/(4*b^2*c^2) + (3*Cos[(3*a)/b]*CosIntegral[(3*(a + b*Arc
Sin[c*x]))/b])/(4*b^2*c^2) + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/
(4*b^2*c^2) + (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(4*b^
2*c^2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
```

```
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{x(1-c^2x^2)}{bc(a+b\arcsin(cx))}+\frac{\int\frac{1}{a+b\arcsin(cx)}\,dx}{bc}-\frac{(3c)\int\frac{x^2}{a+b\arcsin(cx)}\,dx}{b}\\ &= -\frac{x(1-c^2x^2)}{bc(a+b\arcsin(cx))}+\frac{\text{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2}\\ &\quad-\frac{3\text{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2}\end{aligned}$$

$$= -\frac{x(1-c^2x^2)}{bc(a+b\arcsin(cx))} - \frac{3\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)dx, x, a+b\arcsin(cx)\right)}{b^2c^2} + \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}dx, x, a+b\arcsin(cx)\right)}{b^2c^2} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}dx, x, a+b\arcsin(cx)\right)}{b^2c^2}$$

$$= -\frac{x(1-c^2x^2)}{bc(a+b\arcsin(cx))} + \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c^2} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c^2} + \frac{3\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} - \frac{3\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}dx, x, a+b\arcsin(cx)\right)}{4b^2c^2}$$

$$= -\frac{x(1-c^2x^2)}{bc(a+b\arcsin(cx))} + \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c^2} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c^2} - \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} + \frac{\left(3\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} - \frac{\left(3\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} + \frac{\left(3\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}dx, x, a+b\arcsin(cx)\right)}{4b^2c^2}$$

$$= -\frac{x(1-c^2x^2)}{bc(a+b\arcsin(cx))} + \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^2} + \frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^2} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^2} + \frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^2}$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.83

$$\int \frac{x\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx$$
$$= \frac{-\frac{4bcx}{a+b\arcsin(cx)}+\frac{4bc^3x^3}{a+b\arcsin(cx)}+\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)+3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(\right.\right.}{4b^2c^2}$$

```
[In] Integrate[(x*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] ((-4*b*c*x)/(a + b*ArcSin[c*x]) + (4*b*c^3*x^3)/(a + b*ArcSin[c*x]) + Cos[a
/b]*CosIntegral[a/b + ArcSin[c*x]] + 3*Cos[(3*a)/b]*CosIntegral[3*(a/b + Ar
cSin[c*x])] + Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 3*Sin[(3*a)/b]*SinI
ntegral[3*(a/b + ArcSin[c*x])])/(4*b^2*c^2)
```

Maple [A] (verified)

Time = 0.19 (sec) , antiderivative size = 223, normalized size of antiderivative = 1.49

method	result
default	$\frac{3\arcsin(cx)\,\mathrm{Si}\left(3\arcsin(cx)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)b+3\arcsin(cx)\,\mathrm{Ci}\left(3\arcsin(cx)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)b+\arcsin(cx)\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b+\arcsin(}{}$

```
[In] int(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/c^2*(3*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b+3*arcsin(c*x)*C
i(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b+arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b
)*b+arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+3*Si(3*arcsin(c*x)+3*a/b)*si
n(3*a/b)*a+3*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a+Si(arcsin(c*x)+a/b)*sin(a
/b)*a+Ci(arcsin(c*x)+a/b)*cos(a/b)*a-x*b*c-sin(3*arcsin(c*x))*b)/(a+b*arcsi
n(c*x))/b^2
```

Fricas [F]

$$\int \frac{x\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}\,x}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)*x/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
, x)
```

Sympy [F]

$$\int \frac{x\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x\sqrt{-(cx-1)(cx+1)}}{(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate(x*(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x*sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \frac{x\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}x}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^2*x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integ
rate((3*c^2*x^2 - 1)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*
b*c), x) - x)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 608 vs. $2(140) = 280$.

Time = 0.40 (sec) , antiderivative size = 608, normalized size of antiderivative = 4.05

$$\int \frac{x\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \frac{3\,b\arcsin(cx)\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3\,a}{b}+3\,\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2} + \frac{3\,b\arcsin(cx)\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3\,a}{b}+3\,\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2} + \frac{3\,a\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3\,a}{b}+3\,\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2} + \frac{3\,a\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3\,a}{b}+3\,\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2} + \frac{(c^2x^2-1)bcx}{b^3c^2\arcsin(cx)+ab^2c^2} - \frac{9\,b\arcsin(cx)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3\,a}{b}+3\,\arcsin(cx)\right)}{4\,(b^3c^2\arcsin(cx)+ab^2c^2)} + \frac{b\arcsin(cx)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{4\,(b^3c^2\arcsin(cx)+ab^2c^2)} - \frac{3\,b\arcsin(cx)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3\,a}{b}+3\,\arcsin(cx)\right)}{4\,(b^3c^2\arcsin(cx)+ab^2c^2)} + \frac{b\arcsin(cx)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4\,(b^3c^2\arcsin(cx)+ab^2c^2)} - \frac{9\,a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3\,a}{b}+3\,\arcsin(cx)\right)}{4\,(b^3c^2\arcsin(cx)+ab^2c^2)} + \frac{a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{4\,(b^3c^2\arcsin(cx)+ab^2c^2)} - \frac{3\,a\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3\,a}{b}+3\,\arcsin(cx)\right)}{4\,(b^3c^2\arcsin(cx)+ab^2c^2)} + \frac{a\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4\,(b^3c^2\arcsin(cx)+ab^2c^2)}$$

```
[In] integrate(x*(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 3*b*arcsin(c*x)*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arc
sin(c*x) + a*b^2*c^2) + 3*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(3*
a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 3*a*cos(a/b)^3*cos
_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 3*a*co
s(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x)
+ a*b^2*c^2) + (c^2*x^2 - 1)*b*c*x/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 9/4*
b*arcsin(c*x)*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(
c*x) + a*b^2*c^2) + 1/4*b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcsin(c*
x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 3/4*b*arcsin(c*x)*sin(a/b)*sin_inte
gral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 1/4*b*arcsi
```

```
n(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^
2*c^2) - 9/4*a*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin
(c*x) + a*b^2*c^2) + 1/4*a*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^
2*arcsin(c*x) + a*b^2*c^2) - 3/4*a*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c
*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 1/4*a*sin(a/b)*sin_integral(a/b +
arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{x\,\sqrt{1-c^2\,x^2}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

```
[In] int((x*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2,x)
[Out] int((x*(1 - c^2*x^2)^(1/2))/(a + b*asin(c*x))^2, x)
```

3.384 $\int \frac{\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 86

$$\int \frac{\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = -\frac{1-c^2x^2}{bc(a+b\arcsin(cx))}+\frac{\operatorname{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^2c}-\frac{\cos\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c}$$

```
[Out] (c^2*x^2-1)/b/c/(a+b*arcsin(c*x))-cos(2*a/b)*Si(2*(a+b*arcsin(c*x))/b)/b^2/
c+Ci(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b^2/c
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {4751, 4731, 4491, 12, 3384, 3380, 3383}

$$\int \frac{\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \frac{\sin\left(\frac{2a}{b}\right)\operatorname{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c}-\frac{\cos\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c}-\frac{1-c^2x^2}{bc(a+b\arcsin(cx))}$$

```
[In] Int[Sqrt[1 - c^2*x^2]/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((1 - c^2*x^2)/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*(a + b*ArcSin[
c*x]))/b]*Sin[(2*a)/b])/(b^2*c) - (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSi
n[c*x]))/b])/(b^2*c)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rubi steps

$$\text{integral} = -\frac{1-c^2x^2}{bc(a+b\arcsin(cx))} - \frac{(2c)\int \frac{x}{a+b\arcsin(cx)}\,dx}{b}$$

$$= -\frac{1-c^2x^2}{bc(a+b\arcsin(cx))} + \frac{2\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$

$$= -\frac{1-c^2x^2}{bc(a+b\arcsin(cx))} + \frac{2\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$

$$= -\frac{1-c^2x^2}{bc(a+b\arcsin(cx))} + \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$

$$= -\frac{1-c^2x^2}{bc(a+b\arcsin(cx))} - \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$
$$+ \frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$

$$= -\frac{1-c^2x^2}{bc(a+b\arcsin(cx))} + \frac{\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^2c} - \frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c}$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.84

$$\int \frac{\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx$$
$$= \frac{\frac{b(-1+c^2x^2)}{a+b\arcsin(cx)} + \text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{2a}{b}\right) - \cos\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)}{b^2c}$$

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(a + b*ArcSin[c*x])^2,x]
[Out] ((b*(-1 + c^2*x^2))/(a + b*ArcSin[c*x]) + CosIntegral[2*(a/b + ArcSin[c*x])
]*Sin[(2*a)/b] - Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(b^2*c)
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.56

method	result
default	$-\frac{2\arcsin(cx)\,\mathrm{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)b-2\arcsin(cx)\,\mathrm{Ci}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)b+2\,\mathrm{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)a-2\,\mathrm{Ci}(2}{2c(a+b\arcsin(cx))b^2}$

```
[In] int((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
[Out] -1/2/c*(2*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*b-2*arcsin(c*x)*Ci
(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+2*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*a-2
*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(2*arcsin(c*x))*b+b)/(a+b*arcsin(c
*x))/b^2
```

Fricas [F]

$$\int \frac{\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2),
x)
```

Sympy [F]

$$\int \frac{\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-(cx-1)(cx+1)}}{(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(1/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \frac{\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (c^2*x^2 - 2*(b^2*c^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c^2)
*integrate(x/(b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b), x) - 1
)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 290 vs. $2(84) = 168$.

Time = 0.37 (sec) , antiderivative size = 290, normalized size of antiderivative = 3.37

$$\int \frac{\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \frac{2\,b\arcsin(cx)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c\arcsin(cx)+ab^2c} - \frac{2\,b\arcsin(cx)\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c\arcsin(cx)+ab^2c} + \frac{2\,a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c\arcsin(cx)+ab^2c} - \frac{2\,a\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c\arcsin(cx)+ab^2c} + \frac{b\arcsin(cx)\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c\arcsin(cx)+ab^2c} + \frac{(c^2x^2-1)b}{b^3c\arcsin(cx)+ab^2c} + \frac{a\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c\arcsin(cx)+ab^2c}$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 2*b*arcsin(c*x)*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*
c*arcsin(c*x) + a*b^2*c) - 2*b*arcsin(c*x)*cos(a/b)^2*sin_integral(2*a/b +
2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 2*a*cos(a/b)*cos_integral(2*
a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) - 2*a*cos(a/b)^
2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + b*arc
sin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
+ (c^2*x^2 - 1)*b/(b^3*c*arcsin(c*x) + a*b^2*c) + a*sin_integral(2*a/b + 2*
arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-c^2x^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{1-c^2\,x^2}}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}\,dx$$

```
[In] int((1 - c^2*x^2)^(1/2)/(a + b*asin(c*x))^2,x)
```

```
[Out] int((1 - c^2*x^2)^(1/2)/(a + b*asin(c*x))^2, x)
```

3.385 $\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))^2}\,dx = -\frac{1-c^2x^2}{bcx(a+b\arcsin(cx))} - \frac{\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2} - \frac{\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2} - \frac{\operatorname{Int}\left(\frac{1}{x^2(a+b\arcsin(cx))},x\right)}{bc}$$

```
[Out] (c^2*x^2-1)/b/c/x/(a+b*arcsin(c*x))-Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b^2-Si
((a+b*arcsin(c*x))/b)*sin(a/b)/b^2-Unintegrable(1/x^2/(a+b*arcsin(c*x)),x)/
b/c
```

Rubi [N/A]

Not integrable

Time = 0.14 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)/(b*c*x*(a + b*ArcSin[c*x]))) - (Cos[a/b]*CosIntegral[(a + b
*ArcSin[c*x])/b])/b^2 - (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/b^2 -
 Defer[Int][1/(x^2*(a + b*ArcSin[c*x])), x]/(b*c)
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{1-c^2x^2}{bcx(a+b\arcsin(cx))} - \frac{\int \frac{1}{x^2(a+b\arcsin(cx))}\,dx}{bc} - \frac{c\int \frac{1}{a+b\arcsin(cx)}\,dx}{b} \\
&= -\frac{1-c^2x^2}{bcx(a+b\arcsin(cx))} - \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{\int \frac{1}{x^2(a+b\arcsin(cx))}\,dx}{bc} \\
&= -\frac{1-c^2x^2}{bcx(a+b\arcsin(cx))} - \frac{\int \frac{1}{x^2(a+b\arcsin(cx))}\,dx}{bc} \\
&\quad - \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2} \\
&\quad - \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2} \\
&= -\frac{1-c^2x^2}{bcx(a+b\arcsin(cx))} - \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2} \\
&\quad - \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2} - \frac{\int \frac{1}{x^2(a+b\arcsin(cx))}\,dx}{bc}
\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 10.62 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.39 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{\sqrt{-c^2x^2+1}}{x\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.54

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)^2x}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) + a^
2*x), x)
```

Sympy [N/A]

Not integrable

Time = 1.09 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-(cx-1)(cx+1)}}{x(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(1/2)/x/(a+b*asin(c*x))**2,x)
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.77 (sec) , antiderivative size = 128, normalized size of antiderivative = 4.57

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)^2x}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (c^2*x^2 - (b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x)*i
ntegrate((c^2*x^2 + 1)/(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
) + a*b*c*x^2), x) - 1)/(b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
 + a*b*c*x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

[In] integrate((-c^2*x^2+1)^(1/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{1-c^2\,x^2}}{x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

[In] int((1 - c^2*x^2)^(1/2)/(x*(a + b*asin(c*x))^2),x)

[Out] int((1 - c^2*x^2)^(1/2)/(x*(a + b*asin(c*x))^2), x)

3.386 $\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))^2}\,dx = -\frac{1-c^2x^2}{bcx^2(a+b\arcsin(cx))} - \frac{2\text{Int}\left(\frac{1}{x^3(a+b\arcsin(cx))},x\right)}{bc}$$

```
[Out] (c^2*x^2-1)/b/c/x^2/(a+b*arcsin(c*x))-2*Unintegrable(1/x^3/(a+b*arcsin(c*x)
),x)/b/c
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Defer[Int][1/(x^3*(a +
b*ArcSin[c*x])), x])/(b*c)
```

Rubi steps

$$\text{integral} = -\frac{1-c^2x^2}{bcx^2(a+b\arcsin(cx))} - \frac{2\int \frac{1}{x^3(a+b\arcsin(cx))}\,dx}{bc}$$

Mathematica [N/A]

Not integrable

Time = 2.04 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^2*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.25 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{\sqrt{-c^2x^2+1}}{x^2\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.75

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{\left(b\arcsin\left(cx\right)+a\right)^2x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x)
+ a^2*x^2), x)
```

Sympy [N/A]

Not integrable

Time = 0.98 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-(cx-1)(cx+1)}}{x^2\left(a+b\,\mathrm{asin}\,(cx)\right)^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**2/(a+b*asin(c*x))**2,x)
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**2*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.68 (sec) , antiderivative size = 126, normalized size of antiderivative = 4.50

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{\left(b\arcsin\left(cx\right)+a\right)^2x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (c^2*x^2 - 2*(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*
x^2)*integrate(1/(b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*
b*c*x^3), x) - 1)/(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a
*b*c*x^2)
```

Giac [N/A]

Not integrable

Time = 0.82 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{\left(b\arcsin\left(cx\right)+a\right)^2x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)^2*x^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^2(a+b\arcsin(cx))^2}\,dx=\int \frac{\sqrt{1-c^2\,x^2}}{x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

```
[In] int((1 - c^2*x^2)^(1/2)/(x^2*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(1/2)/(x^2*(a + b*asin(c*x))^2), x)
```

3.387 $\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))^2}\,dx=\text{Int}\left(\frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.08 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))^2}\,dx=\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral}=\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 13.07 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))^2}\,dx=\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.00 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{\sqrt{-c^2x^2+1}}{x^3\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.75

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))^2}\,dx=\int \frac{\sqrt{-c^2x^2+1}}{\left(b\arcsin\left(cx\right)+a\right)^2x^3}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x)
+ a^2*x^3), x)
```

Sympy [N/A]

Not integrable

Time = 1.22 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-(cx-1)(cx+1)}}{x^3(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**3/(a+b*asin(c*x))**2,x)
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**3*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.84 (sec) , antiderivative size = 135, normalized size of antiderivative = 4.82

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)^2x^3}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (c^2*x^2 + (b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^
3)*integrate((c^2*x^2 - 3)/(b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
+ 1)) + a*b*c*x^4), x) - 1)/(b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)) + a*b*c*x^3)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^3(a+b\arcsin(cx))^2}\,dx=\int \frac{\sqrt{1-c^2\,x^2}}{x^3\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

```
[In] int((1 - c^2*x^2)^(1/2)/(x^3*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(1/2)/(x^3*(a + b*asin(c*x))^2), x)
```

3.388 $\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.08 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 3.92 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))^2}\,dx=\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[Sqrt[1 - c^2*x^2]/(x^4*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.27 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{\sqrt{-c^2x^2+1}}{x^4\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.75

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))^2}\,dx=\int \frac{\sqrt{-c^2x^2+1}}{\left(b\arcsin\left(cx\right)+a\right)^2x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x)
+ a^2*x^4), x)
```

Sympy [N/A]

Not integrable

Time = 1.41 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-(cx-1)(cx+1)}}{x^4(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(1/2)/x**4/(a+b*asin(c*x))**2,x)
[Out] Integral(sqrt(-(c*x - 1)*(c*x + 1))/(x**4*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.82 (sec) , antiderivative size = 136, normalized size of antiderivative = 4.86

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)^2x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (c^2*x^2 + (b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^
4)*integrate(2*(c^2*x^2 - 2)/(b^2*c*x^5*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)) + a*b*c*x^5), x) - 1)/(b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1)) + a*b*c*x^4)
```

Giac [N/A]

Not integrable

Time = 2.04 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{-c^2x^2+1}}{(b\arcsin(cx)+a)^2x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(1/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(sqrt(-c^2*x^2 + 1)/((b*arcsin(c*x) + a)^2*x^4), x)
```

Mupad [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{1-c^2x^2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{1-c^2\,x^2}}{x^4\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}\,dx$$

```
[In] int((1 - c^2*x^2)^(1/2)/(x^4*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(1/2)/(x^4*(a + b*asin(c*x))^2), x)
```

3.389 $\int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2} dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2} dx = \text{Int}\left(\frac{x^m(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}, x\right)$$

```
[Out] Unintegrable(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2} dx = \int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2} dx$$

```
[In] Int[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\text{integral} = \int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2} dx$$

Mathematica [N/A]

Not integrable

Time = 0.66 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[(x^m*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.80 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^m(-c^2x^2+1)^{\frac{3}{2}}}{(a+b\arcsin(cx))^2}dx$$

```
[In] int(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 52, normalized size of antiderivative = 1.86

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x^m}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(-(c^2*x^2 - 1)*sqrt(-c^2*x^2 + 1)*x^m/(b^2*arcsin(c*x)^2 + 2*a*b*a
rcsin(c*x) + a^2), x)
```

Sympy [N/A]

Not integrable

Time = 36.92 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x^m(-(cx-1)\,(cx+1))^{\frac{3}{2}}}{(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate(x**m*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(x**m*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x))**2, x)
```

Maxima [N/A]

Not integrable

Time = 1.66 (sec) , antiderivative size = 161, normalized size of antiderivative = 5.75

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x^m}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -((c^4*x^4 - 2*c^2*x^2 + 1)*x^m - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1)) + a*b*c)*integrate(((c^4*m + 4*c^4)*x^4 - 2*(c^2*m + 2*c^2)*x^2 +
m)*x^m/(b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x), x))/
(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x^m\,(1-c^2\,x^2)^{3/2}}{(a+b\,\mathrm{asin}\,(c\,x))^2}\,dx$$

```
[In] int((x^m*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2,x)
[Out] int((x^m*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2, x)
```

3.390 $\int \frac{x^3(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 278

$$\int \frac{x^3(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = -\frac{x^3(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{3\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64b^2c^4} + \frac{9\cos\left(\frac{3a}{b}\right)\operatorname{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} - \frac{5\cos\left(\frac{5a}{b}\right)\operatorname{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} - \frac{7\cos\left(\frac{7a}{b}\right)\operatorname{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} + \frac{3\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64b^2c^4} + \frac{9\sin\left(\frac{3a}{b}\right)\operatorname{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} - \frac{5\sin\left(\frac{5a}{b}\right)\operatorname{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} - \frac{7\sin\left(\frac{7a}{b}\right)\operatorname{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64b^2c^4}$$

```
[Out] -x^3*(-c^2*x^2+1)^2/b/c/(a+b*arcsin(c*x))+3/64*Ci((a+b*arcsin(c*x))/b)*cos(
a/b)/b^2/c^4+9/64*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^4-5/64*Ci(5*(a
+b*arcsin(c*x))/b)*cos(5*a/b)/b^2/c^4-7/64*Ci(7*(a+b*arcsin(c*x))/b)*cos(7*
a/b)/b^2/c^4+3/64*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c^4+9/64*Si(3*(a+b*a
rcsin(c*x))/b)*sin(3*a/b)/b^2/c^4-5/64*Si(5*(a+b*arcsin(c*x))/b)*sin(5*a/b)
/b^2/c^4-7/64*Si(7*(a+b*arcsin(c*x))/b)*sin(7*a/b)/b^2/c^4
```

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {4799, 4809, 4491, 3384, 3380, 3383}

$$\int \frac{x^3(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64b^2c^4} + \frac{9\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} - \frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} - \frac{7\cos\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} + \frac{3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64b^2c^4} + \frac{9\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} - \frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} - \frac{7\sin\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} - \frac{x^3(1-c^2x^2)^2}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(x^3*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^3*(1 - c^2*x^2)^2)/(b*c*(a + b*ArcSin[c*x]))) + (3*Cos[a/b]*CosIntegra
l[(a + b*ArcSin[c*x])/b])/(64*b^2*c^4) + (9*Cos[(3*a)/b]*CosIntegral[(3*(a
+ b*ArcSin[c*x]))/b])/(64*b^2*c^4) - (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*
ArcSin[c*x]))/b])/(64*b^2*c^4) - (7*Cos[(7*a)/b]*CosIntegral[(7*(a + b*ArcS
in[c*x]))/b])/(64*b^2*c^4) + (3*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b]
)/(64*b^2*c^4) + (9*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(6
4*b^2*c^4) - (5*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(64*b^
2*c^4) - (7*Sin[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/(64*b^2*c^
4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{x^3(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{3\int \frac{x^2(1-c^2x^2)}{a+b\arcsin(cx)}\,dx}{bc} - \frac{(7c)\int \frac{x^4(1-c^2x^2)}{a+b\arcsin(cx)}\,dx}{b}$$

$$= -\frac{x^3(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{3\text{Subst}\left(\int \frac{\cos^3\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^4} - \frac{7\text{Subst}\left(\int \frac{\cos^3\left(\frac{a}{b}-\frac{x}{b}\right)\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^4}$$

$$= -\frac{x^3(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{3\text{Subst}\left(\int\left(-\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x}-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right)dx,x,a+b\arcsin(cx)\right)}{b^2c^4} - \frac{7\text{Subst}\left(\int\left(\frac{\cos\left(\frac{7a}{b}-\frac{7x}{b}\right)}{64x}-\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{64x}-\frac{3\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{64x}+\frac{3\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{64x}\right)dx,x,a+b\arcsin(cx)\right)}{b^2c^4}$$

$$= -\frac{x^3(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} - \frac{7\text{Subst}\left(\int\frac{\cos\left(\frac{7a}{b}-\frac{7x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{64b^2c^4} + \frac{7\text{Subst}\left(\int\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{64b^2c^4} - \frac{3\text{Subst}\left(\int\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{16b^2c^4} - \frac{3\text{Subst}\left(\int\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{16b^2c^4} + \frac{21\text{Subst}\left(\int\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{64b^2c^4} - \frac{21\text{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{64b^2c^4} + \frac{3\text{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{8b^2c^4}$$

$$
\begin{aligned}
= & -\frac{x^3(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} - \frac{\left(21\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64b^2c^4} \\
& + \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8b^2c^4} \\
& - \frac{\left(3\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16b^2c^4} \\
& + \frac{\left(21\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64b^2c^4} \\
& + \frac{\left(7\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64b^2c^4} \\
& - \frac{\left(3\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16b^2c^4} \\
& - \frac{\left(7\cos\left(\frac{7a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{7x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64b^2c^4} \\
& - \frac{\left(21\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64b^2c^4} \\
& + \frac{\left(3\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8b^2c^4} \\
& - \frac{\left(3\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16b^2c^4} \\
& + \frac{\left(21\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64b^2c^4} \\
& + \frac{\left(7\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64b^2c^4} \\
& - \frac{\left(3\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16b^2c^4} \\
& - \frac{\left(7\sin\left(\frac{7a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{7x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{64b^2c^4}
\end{aligned}
$$

$$= -\frac{x^3(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64b^2c^4} + \frac{9\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} - \frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} - \frac{7\cos\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} + \frac{3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64b^2c^4} + \frac{9\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} - \frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64b^2c^4} - \frac{7\sin\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64b^2c^4}$$

Mathematica [A] (verified)

Time = 0.84 (sec) , antiderivative size = 399, normalized size of antiderivative = 1.44

$$\int \frac{x^3(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = -\frac{64bc^3x^3 - 128bc^5x^5 + 64bc^7x^7 - 3(a+b\arcsin(cx))\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right) - 9(a+b\arcsin(c$$

```
[In] Integrate[(x^3*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/64*(64*b*c^3*x^3 - 128*b*c^5*x^5 + 64*b*c^7*x^7 - 3*(a + b*ArcSin[c*x])*
Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] - 9*(a + b*ArcSin[c*x])*Cos[(3*a)/b
]*CosIntegral[3*(a/b + ArcSin[c*x])] + 5*a*Cos[(5*a)/b]*CosIntegral[5*(a/b
+ ArcSin[c*x])] + 5*b*ArcSin[c*x]*Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[
c*x])] + 7*a*Cos[(7*a)/b]*CosIntegral[7*(a/b + ArcSin[c*x])] + 7*b*ArcSin[c
*x]*Cos[(7*a)/b]*CosIntegral[7*(a/b + ArcSin[c*x])] - 3*a*Sin[a/b]*SinInteg
ral[a/b + ArcSin[c*x]] - 3*b*ArcSin[c*x]*Sin[a/b]*SinIntegral[a/b + ArcSin[
c*x]] - 9*a*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] - 9*b*ArcSin[c*
x]*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 5*a*Sin[(5*a)/b]*SinIn
tegral[5*(a/b + ArcSin[c*x])] + 5*b*ArcSin[c*x]*Sin[(5*a)/b]*SinIntegral[5*
(a/b + ArcSin[c*x])] + 7*a*Sin[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])]
+ 7*b*ArcSin[c*x]*Sin[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])])/(b^2*c^4
*(a + b*ArcSin[c*x]))
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 455, normalized size of antiderivative = 1.64

method	result
default	$-\frac{7 \arcsin(cx) \operatorname{Si}\left(7 \arcsin(cx)+\frac{7a}{b}\right) \sin\left(\frac{7a}{b}\right) b+7 \arcsin(cx) \operatorname{Ci}\left(7 \arcsin(cx)+\frac{7a}{b}\right) \cos\left(\frac{7a}{b}\right) b-3 \arcsin(cx) \operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right) \sin\left(\frac{a}{b}\right) b-3}{}$

[In] int(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)

[Out] -1/64/c^4*(7*arcsin(c*x)*Si(7*arcsin(c*x)+7*a/b)*sin(7*a/b)*b+7*arcsin(c*x)*Ci(7*arcsin(c*x)+7*a/b)*cos(7*a/b)*b-3*arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b-3*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+5*arcsin(c*x)*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*b+5*arcsin(c*x)*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b-9*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b-9*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b+7*Si(7*arcsin(c*x)+7*a/b)*sin(7*a/b)*a+7*Ci(7*arcsin(c*x)+7*a/b)*cos(7*a/b)*a-3*Si(arcsin(c*x)+a/b)*sin(a/b)*a-3*Ci(arcsin(c*x)+a/b)*cos(a/b)*a+5*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*a+5*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*a-9*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a-9*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a+3*x*b*c-sin(7*arcsin(c*x))*b-sin(5*arcsin(c*x))*b+3*sin(3*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2

Fricas [F]

$$\int \frac{x^3(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x^3}{(b\arcsin(cx)+a)^2}\,dx$$

[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")

[Out] integral(-(c^2*x^5 - x^3)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)

Sympy [F]

$$\int \frac{x^3(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3(-(cx-1)(cx+1))^{\frac{3}{2}}}{(a+b\operatorname{asin}(cx))^2}\,dx$$

[In] integrate(x**3*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)

[Out] Integral(x**3*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x))**2, x)

Maxima [F]

$$\int \frac{x^3(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x^3}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^7 - 2*c^2*x^5 + x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)) + a*b*c)*integrate((7*c^4*x^6 - 10*c^2*x^4 + 3*x^2)/(b^2*c*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2065 vs. 2(261) = 522.

Time = 0.42 (sec) , antiderivative size = 2065, normalized size of antiderivative = 7.43

$$\int \frac{x^3(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \text{Too large to display}$$

```
[In] integrate(x^3*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -7*b*arcsin(c*x)*cos(a/b)^7*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*ar
csin(c*x) + a*b^2*c^4) - 7*b*arcsin(c*x)*cos(a/b)^6*sin(a/b)*sin_integral(7
*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 7*a*cos(a/b)^7*co
s_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 7*a*c
os(a/b)^6*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
 + a*b^2*c^4) + 49/4*b*arcsin(c*x)*cos(a/b)^5*cos_integral(7*a/b + 7*arcsin
(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 5/4*b*arcsin(c*x)*cos(a/b)^5*cos
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 35/4*b
*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c
^4*arcsin(c*x) + a*b^2*c^4) - 5/4*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_int
egral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 49/4*a*cos
(a/b)^5*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^
4) - 5/4*a*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c
*x) + a*b^2*c^4) + 35/4*a*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*arcsin
(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 5/4*a*cos(a/b)^4*sin(a/b)*sin_in
tegral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - (c^2*x^2
- 1)^3*b*c*x/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 49/8*b*arcsin(c*x)*cos(a/b
)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) +
 25/16*b*arcsin(c*x)*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^
4*arcsin(c*x) + a*b^2*c^4) + 9/16*b*arcsin(c*x)*cos(a/b)^3*cos_integral(3*a
/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 21/8*b*arcsin(c*x)*
```

```
cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x
) + a*b^2*c^4) + 15/16*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b
 + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 9/16*b*arcsin(c*x)*co
s(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
+ a*b^2*c^4) - (c^2*x^2 - 1)^2*b*c*x/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 49
/8*a*cos(a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) +
a*b^2*c^4) + 25/16*a*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^
4*arcsin(c*x) + a*b^2*c^4) + 9/16*a*cos(a/b)^3*cos_integral(3*a/b + 3*arcsi
n(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 21/8*a*cos(a/b)^2*sin(a/b)*sin_
integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 15/16*a
*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*
x) + a*b^2*c^4) + 9/16*a*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(
c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 49/64*b*arcsin(c*x)*cos(a/b)*cos_
integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 25/64*b
*arcsin(c*x)*cos(a/b)*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c
*x) + a*b^2*c^4) - 27/64*b*arcsin(c*x)*cos(a/b)*cos_integral(3*a/b + 3*arcs
in(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/64*b*arcsin(c*x)*cos(a/b)*co
s_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 7/64*b*ar
csin(c*x)*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
 + a*b^2*c^4) - 5/64*b*arcsin(c*x)*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c
*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9/64*b*arcsin(c*x)*sin(a/b)*sin_in
tegral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/64*b*ar
csin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a
*b^2*c^4) + 49/64*a*cos(a/b)*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*a
rcsin(c*x) + a*b^2*c^4) - 25/64*a*cos(a/b)*cos_integral(5*a/b + 5*arcsin(c*
x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 27/64*a*cos(a/b)*cos_integral(3*a/b
 + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/64*a*cos(a/b)*cos_i
ntegral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 7/64*a*sin(a
/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) -
 5/64*a*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^4*arcsin(c*x) +
 a*b^2*c^4) - 9/64*a*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*
arcsin(c*x) + a*b^2*c^4) + 3/64*a*sin(a/b)*sin_integral(a/b + arcsin(c*x))/
(b^3*c^4*arcsin(c*x) + a*b^2*c^4)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3\,(1-c^2\,x^2)^{3/2}}{(a+b\,\mathrm{asin}\,(c\,x))^2}\,dx$$

```
[In] int((x^3*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2,x)
[Out] int((x^3*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2, x)
```

3.391 $\int \frac{x^2(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 220

$$\begin{aligned}\int \frac{x^2(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx &= -\frac{x^2(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} \\ &+ \frac{\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{16b^2c^3} - \frac{\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{4b^2c^3} \\ &- \frac{3\,\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{6a}{b}\right)}{16b^2c^3} - \frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} \\ &+ \frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{4b^2c^3} + \frac{3\cos\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{16b^2c^3}\end{aligned}$$

```
[Out] -x^2*(-c^2*x^2+1)^2/b/c/(a+b*arcsin(c*x))-1/16*cos(2*a/b)*Si(2*(a+b*arcsin(
c*x))/b)/b^2/c^3+1/4*cos(4*a/b)*Si(4*(a+b*arcsin(c*x))/b)/b^2/c^3+3/16*cos(
6*a/b)*Si(6*(a+b*arcsin(c*x))/b)/b^2/c^3+1/16*Ci(2*(a+b*arcsin(c*x))/b)*sin
(2*a/b)/b^2/c^3-1/4*Ci(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b^2/c^3-3/16*Ci(6*
(a+b*arcsin(c*x))/b)*sin(6*a/b)/b^2/c^3
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 220, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used

$= \{4799, 4809, 4491, 3384, 3380, 3383\}$

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{4b^2c^3} - \frac{3\sin\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} - \frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} + \frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{4b^2c^3} + \frac{3\cos\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} - \frac{x^2(1-c^2x^2)^2}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(x^2*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^2*(1 - c^2*x^2)^2)/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*(a + b
*ArcSin[c*x]))/b]*Sin[(2*a)/b])/(16*b^2*c^3) - (CosIntegral[(4*(a + b*ArcSi
n[c*x]))/b]*Sin[(4*a)/b])/(4*b^2*c^3) - (3*CosIntegral[(6*(a + b*ArcSin[c*x
]))/b]*Sin[(6*a)/b])/(16*b^2*c^3) - (Cos[(2*a)/b]*SinIntegral[(2*(a + b*Arc
Sin[c*x]))/b])/(16*b^2*c^3) + (Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*
x]))/b])/(4*b^2*c^3) + (3*Cos[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/
b])/(16*b^2*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
```

```
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^2(1-c^2x^2)^2}{bc(a+b\arcsin(cx))}+\frac{2\int\frac{x(1-c^2x^2)}{a+b\arcsin(cx)}\,dx}{bc}-\frac{(6c)\int\frac{x^3(1-c^2x^2)}{a+b\arcsin(cx)}\,dx}{b}\\
&= -\frac{x^2(1-c^2x^2)^2}{bc(a+b\arcsin(cx))}-\frac{2\mathrm{Subst}\left(\int\frac{\cos^3\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3}\\
&\quad+\frac{6\mathrm{Subst}\left(\int\frac{\cos^3\left(\frac{a}{b}-\frac{x}{b}\right)\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3}\\
&= -\frac{x^2(1-c^2x^2)^2}{bc(a+b\arcsin(cx))}\\
&\quad-\frac{2\mathrm{Subst}\left(\int\left(\frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8x}+\frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{4x}\right)\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3}\\
&\quad+\frac{6\mathrm{Subst}\left(\int\left(-\frac{\sin\left(\frac{6a}{b}-\frac{6x}{b}\right)}{32x}+\frac{3\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{32x}\right)\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3}
\end{aligned}$$

$$= -\frac{x^2(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} - \frac{3\text{Subst}\left(\int \frac{\sin\left(\frac{6a}{b}-\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^3} - \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^3} - \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c^3} + \frac{9\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^3}$$

$$= -\frac{x^2(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c^3} - \frac{\left(9\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^3} + \frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^3} + \frac{\left(3\cos\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^3} - \frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c^3} + \frac{\left(9\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^3} - \frac{\left(3\sin\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^3}$$

$$= -\frac{x^2(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{16b^2c^3} - \frac{\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{4b^2c^3} - \frac{3\,\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{6a}{b}\right)}{16b^2c^3} - \frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} + \frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{4b^2c^3} + \frac{3\cos\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{16b^2c^3}$$

Mathematica [A] (verified)

Time = 0.65 (sec) , antiderivative size = 306, normalized size of antiderivative = 1.39

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = -\frac{16bc^2x^2-32bc^4x^4+16bc^6x^6-(a+b\arcsin(cx))\,\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{2a}{b}\right)+4(a+b\arcsin$$

```
[In] Integrate[(x^2*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/16*(16*b*c^2*x^2 - 32*b*c^4*x^4 + 16*b*c^6*x^6 - (a + b*ArcSin[c*x])*Cos
Integral[2*(a/b + ArcSin[c*x])]*Sin[(2*a)/b] + 4*(a + b*ArcSin[c*x])*CosInt
egral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] + 3*a*CosIntegral[6*(a/b + ArcSin
[c*x])]*Sin[(6*a)/b] + 3*b*ArcSin[c*x]*CosIntegral[6*(a/b + ArcSin[c*x])]*S
in[(6*a)/b] + a*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] + b*ArcSin[
c*x]*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - 4*a*Cos[(4*a)/b]*Sin
Integral[4*(a/b + ArcSin[c*x])] - 4*b*ArcSin[c*x]*Cos[(4*a)/b]*SinIntegral[
4*(a/b + ArcSin[c*x])] - 3*a*Cos[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])
] - 3*b*ArcSin[c*x]*Cos[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])])/(b^2*c
^3*(a + b*ArcSin[c*x]))
```

Maple [A] (verified)

Time = 0.24 (sec) , antiderivative size = 364, normalized size of antiderivative = 1.65

method	result
default	$\frac{8\arcsin(cx)\,\mathrm{Si}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)b-8\arcsin(cx)\,\mathrm{Ci}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)b-2\arcsin(cx)\,\mathrm{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)b+2}{}$

```
[In] int(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/32/c^3*(8*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-8*arcsin(c*x)*
Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b-2*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*
cos(2*a/b)*b+2*arcsin(c*x)*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+6*arcsin(c*
x)*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*b-6*arcsin(c*x)*Ci(6*arcsin(c*x)+6*a/
b)*sin(6*a/b)*b+8*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*a-8*Ci(4*arcsin(c*x)+4
*a/b)*sin(4*a/b)*a-2*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*a+2*Ci(2*arcsin(c*x
)+2*a/b)*sin(2*a/b)*a+6*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*a-6*Ci(6*arcsin(
c*x)+6*a/b)*sin(6*a/b)*a+2*cos(4*arcsin(c*x))*b-cos(2*arcsin(c*x))*b+cos(6*
arcsin(c*x))*b-2*b)/(a+b*arcsin(c*x))/b^2
```

Fricas [F]

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x^2}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(-(c^2*x^4 - x^2)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 + 2*a*b*arc
sin(c*x) + a^2), x)
```

Sympy [F]

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2(-(cx-1)(cx+1))^{\frac{3}{2}}}{(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate(x**2*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x^2}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^6 - 2*c^2*x^4 + x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)) + a*b*c)*integrate(2*(3*c^4*x^5 - 4*c^2*x^3 + x)/(b^2*c*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1553 vs. $2(207) = 414$.

Time = 0.42 (sec) , antiderivative size = 1553, normalized size of antiderivative = 7.06

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \text{Too large to display}$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

[Out] -6*b*arcsin(c*x)*cos(a/b)^5*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*b*arcsin(c*x)*cos(a/b)^6*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 6*a*cos(a/b)^5*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*a*cos(a/b)^6*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*b*arcsin(c*x)*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9*b*arcsin(c*x)*cos(a/b)^4*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 2*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*a*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*a*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9*a*cos(a/b)^4*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 2*a*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9/8*b*arcsin(c*x)*cos(a/b)*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/8*b*arcsin(c*x)*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 27/8*b*arcsin(c*x)*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*b*arcsin(c*x)*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 1/8*b*arcsin(c*x)*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - (c^2*x^2 - 1)^3*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9/8*a*cos(a/b)*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + a*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/8*a*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 27/8*a*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*a*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 1/8*a*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - (c^2*x^2 - 1)^2*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 3/16*b*arcsin(c*x)*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/4*b*arcsin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/16*b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 3/16*a*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/4*a*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/16*a*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2\,(1-c^2\,x^2)^{3/2}}{(a+b\,\mathrm{asin}\,(c\,x))^2}\,dx$$

```
[In] int((x^2*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2,x)
[Out] int((x^2*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2, x)
```

3.392 $\int \frac{x(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 214

$$\int \frac{x(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = -\frac{x(1-c^2x^2)^2}{bc(a+b\arcsin(cx))}+\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^2}+\frac{9\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^2}+\frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^2}+\frac{9\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^2}+\frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^2}$$

```
[Out] -x*(-c^2*x^2+1)^2/b/c/(a+b*arcsin(c*x))+1/8*Ci((a+b*arcsin(c*x))/b)*cos(a/b
)/b^2/c^2+9/16*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^2+5/16*Ci(5*(a+b*
arcsin(c*x))/b)*cos(5*a/b)/b^2/c^2+1/8*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2
/c^2+9/16*Si(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^2+5/16*Si(5*(a+b*arcsi
n(c*x))/b)*sin(5*a/b)/b^2/c^2
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used

$= \{4799, 4753, 3393, 3384, 3380, 3383, 4809, 4491\}$

$$\int \frac{x(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^2} + \frac{9\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^2} + \frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^2} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^2} + \frac{9\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^2} + \frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^2} - \frac{x(1-c^2x^2)^2}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(x*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x*(1 - c^2*x^2)^2)/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[(a
 + b*ArcSin[c*x])/b])/(8*b^2*c^2) + (9*Cos[(3*a)/b]*CosIntegral[(3*(a + b*A
rcSin[c*x]))/b])/(16*b^2*c^2) + (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSi
n[c*x]))/b])/(16*b^2*c^2) + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(
8*b^2*c^2) + (9*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(16*b^
2*c^2) + (5*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b^2*c^
2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{x(1-c^2x^2)^2}{bc(a+b\arcsin(cx))}+\frac{\int \frac{1-c^2x^2}{a+b\arcsin(cx)}\,dx}{bc}-\frac{(5c)\int \frac{x^2(1-c^2x^2)}{a+b\arcsin(cx)}\,dx}{b}\\ &= -\frac{x(1-c^2x^2)^2}{bc(a+b\arcsin(cx))}+\frac{\text{Subst}\left(\int \frac{\cos^3\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2}\\ &\quad-\frac{5\text{Subst}\left(\int \frac{\cos^3\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2}\end{aligned}$$

$$= -\frac{x(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{\text{Subst}\left(\int \left(\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x} + \frac{3\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right) dx, x, a+b\arcsin(cx)\right)}{b^2c^2} - \frac{5\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x} - \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x} + \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right) dx, x, a+b\arcsin(cx)\right)}{b^2c^2}$$

$$= -\frac{x(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} + \frac{5\text{Subst}\left(\int \frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{16b^2c^2} + \frac{5\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{16b^2c^2} - \frac{5\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{8b^2c^2} + \frac{3\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{4b^2c^2}$$

$$= -\frac{x(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} - \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{8b^2c^2} + \frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} + \frac{\cos\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} + \frac{\left(5\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{16b^2c^2} + \frac{\left(5\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{16b^2c^2} - \frac{\left(5\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{8b^2c^2} + \frac{\left(3\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} + \frac{\sin\left(\frac{3a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} + \frac{\left(5\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{16b^2c^2} + \frac{\left(5\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{16b^2c^2}$$

$$= -\frac{x(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^2} + \frac{9\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^2} + \frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^2} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^2} + \frac{9\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^2} + \frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^2}$$

Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 295, normalized size of antiderivative = 1.38

$$\int \frac{x(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \frac{-16bcx + 32bc^3x^3 - 16bc^5x^5 + 2(a+b\arcsin(cx))\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b} + \arcsin\right.}{}$$

```
[In] Integrate[(x*(1 - c^2*x^2)^(3/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-16*b*c*x + 32*b*c^3*x^3 - 16*b*c^5*x^5 + 2*(a + b*ArcSin[c*x])*Cos[a/b]*C
osIntegral[a/b + ArcSin[c*x]] + 9*(a + b*ArcSin[c*x])*Cos[(3*a)/b]*CosInteg
ral[3*(a/b + ArcSin[c*x])] + 5*a*Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c
*x])] + 5*b*ArcSin[c*x]*Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c*x])] + 2
*a*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 2*b*ArcSin[c*x]*Sin[a/b]*SinIn
tegral[a/b + ArcSin[c*x]] + 9*a*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*
x])] + 9*b*ArcSin[c*x]*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 5*
a*Sin[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])] + 5*b*ArcSin[c*x]*Sin[(5*
a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*b^2*c^2*(a + b*ArcSin[c*x]))
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 341, normalized size of antiderivative = 1.59

method	result
default	$\frac{5\arcsin(cx)\,\text{Si}\left(5\arcsin(cx)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)b+5\arcsin(cx)\,\text{Ci}\left(5\arcsin(cx)+\frac{5a}{b}\right)\cos\left(\frac{5a}{b}\right)b+9\arcsin(cx)\,\text{Si}\left(3\arcsin(cx)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)b+9}{}$

```
[In] int(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/16/c^2*(5*arcsin(c*x)*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*b+5*arcsin(c*x)*
Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b+9*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*
sin(3*a/b)*b+9*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b+2*arcsin(c*
x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b+2*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b
)*b+5*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*a+5*Ci(5*arcsin(c*x)+5*a/b)*cos(5*
```

```
a/b)*a+9*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a+9*Ci(3*arcsin(c*x)+3*a/b)*cos
(3*a/b)*a+2*Si(arcsin(c*x)+a/b)*sin(a/b)*a+2*Ci(arcsin(c*x)+a/b)*cos(a/b)*a
-2*x*b*c-sin(5*arcsin(c*x))*b-3*sin(3*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2
```

Fricas [F]

$$\int \frac{x(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(-(c^2*x^3 - x)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsi
n(c*x) + a^2), x)
```

Sympy [F]

$$\int \frac{x(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x(-(cx-1)(cx+1))^{\frac{3}{2}}}{(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate(x*(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(x*(-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \frac{x(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}x}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -(c^4*x^5 - 2*c^2*x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) +
 a*b*c)*integrate((5*c^4*x^4 - 6*c^2*x^2 + 1)/(b^2*c*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) + a*b*c), x) + x)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1215 vs. $2(201) = 402$.

Time = 0.41 (sec) , antiderivative size = 1215, normalized size of antiderivative = 5.68

$$\int \frac{x(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \text{Too large to display}$$

```
[In] integrate(x*(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 5*b*arcsin(c*x)*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arc
sin(c*x) + a*b^2*c^2) + 5*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(5*
a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5*a*cos(a/b)^5*cos
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5*a*co
s(a/b)^4*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x)
+ a*b^2*c^2) - 25/4*b*arcsin(c*x)*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(
c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 9/4*b*arcsin(c*x)*cos(a/b)^3*cos_
integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 15/4*b*
arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^
2*arcsin(c*x) + a*b^2*c^2) + 9/4*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_inte
gral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - (c^2*x^2 -
1)^2*b*c*x/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 25/4*a*cos(a/b)^3*cos_integr
al(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 9/4*a*cos(a/b
)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) -
 15/4*a*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*ar
csin(c*x) + a*b^2*c^2) + 9/4*a*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*a
rcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/16*b*arcsin(c*x)*cos(a/b
)*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 2
7/16*b*arcsin(c*x)*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*ar
csin(c*x) + a*b^2*c^2) + 1/8*b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcs
in(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5/16*b*arcsin(c*x)*sin(a/b)*si
n_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 9/16*
b*arcsin(c*x)*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(
c*x) + a*b^2*c^2) + 1/8*b*arcsin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*
x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/16*a*cos(a/b)*cos_integral(5*a/b
 + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 27/16*a*cos(a/b)*cos_
integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 1/8*a*c
os(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) +
 5/16*a*sin(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) +
 a*b^2*c^2) - 9/16*a*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*
arcsin(c*x) + a*b^2*c^2) + 1/8*a*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(
b^3*c^2*arcsin(c*x) + a*b^2*c^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x\,(1-c^2\,x^2)^{3/2}}{(a+b\,\mathrm{asin}\,(c\,x))^2}\,dx$$

```
[In] int((x*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2,x)
[Out] int((x*(1 - c^2*x^2)^(3/2))/(a + b*asin(c*x))^2, x)
```

3.393 $\int \frac{(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 150

$$\int \frac{(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = -\frac{(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^2c} + \frac{\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{2b^2c} - \frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c} - \frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{2b^2c}$$

```
[Out] -(-c^2*x^2+1)^2/b/c/(a+b*arcsin(c*x))-cos(2*a/b)*Si(2*(a+b*arcsin(c*x))/b)/
b^2/c-1/2*cos(4*a/b)*Si(4*(a+b*arcsin(c*x))/b)/b^2/c+Ci(2*(a+b*arcsin(c*x))
/b)*sin(2*a/b)/b^2/c+1/2*Ci(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b^2/c
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {4751, 4809, 4491, 3384, 3380, 3383}

$$\int \frac{(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c} + \frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{2b^2c} - \frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c} - \frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{2b^2c} - \frac{(1-c^2x^2)^2}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(1 - c^2*x^2)^(3/2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((1 - c^2*x^2)^2/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*(a + b*ArcSi
n[c*x]))/b]*Sin[(2*a)/b])/(b^2*c) + (CosIntegral[(4*(a + b*ArcSin[c*x]))/b]
*Sin[(4*a)/b])/(2*b^2*c) - (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x])
)/b])/(b^2*c) - (Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(2*b^
2*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
```

```
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} - \frac{(4c)\int \frac{x(1-c^2x^2)}{a+b\arcsin(cx)}\,dx}{b}$$

$$= -\frac{(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{4\text{Subst}\left(\int \frac{\cos^3\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$

$$= -\frac{(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{4\text{Subst}\left(\int \left(\frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8x} + \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{4x}\right)dx, x, a+b\arcsin(cx)\right)}{b^2c}$$

$$= -\frac{(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c} + \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$

$$= -\frac{(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} - \frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c} - \frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c} + \frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c} + \frac{\sin\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c}$$

$$= -\frac{(1-c^2x^2)^2}{bc(a+b\arcsin(cx))} + \frac{\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^2c} + \frac{\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{2b^2c} - \frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c} - \frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{2b^2c}$$

Mathematica [A] (verified)

Time = 0.48 (sec) , antiderivative size = 122, normalized size of antiderivative = 0.81

$$\int \frac{(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \frac{-\frac{2b(-1+c^2x^2)^2}{a+b\arcsin(cx)} + 2\,\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{2a}{b}\right) + \text{CosIntegral}\left(4\left(\frac{a}{b}+\right.\right.}{}$$

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] ((-2*b*(-1 + c^2*x^2)^2)/(a + b*ArcSin[c*x]) + 2*CosIntegral[2*(a/b + ArcSi
n[c*x])]*Sin[(2*a)/b] + CosIntegral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] - 2
*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - Cos[(4*a)/b]*SinIntegral
[4*(a/b + ArcSin[c*x])])/(2*b^2*c)
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.67

method	result
default	$-\frac{4\arcsin(cx)\,\text{Si}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)b-4\arcsin(cx)\,\text{Ci}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)b+8\arcsin(cx)\,\text{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)}{}$

```
[In] int((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/8/c*(4*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-4*arcsin(c*x)*Ci
(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b+8*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*co
s(2*a/b)*b-8*arcsin(c*x)*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+4*Si(4*arcsin
(c*x)+4*a/b)*cos(4*a/b)*a-4*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*a+8*Si(2*arc
sin(c*x)+2*a/b)*cos(2*a/b)*a-8*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(4*a
rcsin(c*x))*b+4*cos(2*arcsin(c*x))*b+3*b)/(a+b*arcsin(c*x))/b^2
```

Fricas [F]

$$\int \frac{(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
, x)
```

Sympy [F]

$$\int \frac{(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-(cx-1)(cx+1))^{\frac{3}{2}}}{(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \frac{(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) +
 a*b*c)*integrate(4*(c^3*x^3 - c*x)/(b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1)) + a*b), x) + 1)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
+ a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 747 vs. $2(145) = 290$.

Time = 0.40 (sec) , antiderivative size = 747, normalized size of antiderivative = 4.98

$$\int \frac{(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \text{Too large to display}$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 4*b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^
3*c*arcsin(c*x) + a*b^2*c) - 4*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4*a/b
+ 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 4*a*cos(a/b)^3*cos_integra
l(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) - 4*a*cos(a
/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 2
*b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c
*arcsin(c*x) + a*b^2*c) + 2*b*arcsin(c*x)*cos(a/b)*cos_integral(2*a/b + 2*a
rcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 4*b*arcsin(c*x)*cos(a/
b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 2*
b*arcsin(c*x)*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(
c*x) + a*b^2*c) - 2*a*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)
```

```
/(b^3*c*arcsin(c*x) + a*b^2*c) + 2*a*cos(a/b)*cos_integral(2*a/b + 2*arcsin
(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 4*a*cos(a/b)^2*sin_integral
(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 2*a*cos(a/b)^2*sin_
integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - (c^2*x^2 -
1)^2*b/(b^3*c*arcsin(c*x) + a*b^2*c) - 1/2*b*arcsin(c*x)*sin_integral(4*a/b
 + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + b*arcsin(c*x)*sin_integra
l(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 1/2*a*sin_integral
(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + a*sin_integral(2*a/
b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(1-c^2x^2)^{3/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2\,x^2)^{3/2}}{(a+b\,\mathrm{asin}\,(c\,x))^2}\,dx$$

```
[In] int((1 - c^2*x^2)^(3/2)/(a + b*asin(c*x))^2,x)
[Out] int((1 - c^2*x^2)^(3/2)/(a + b*asin(c*x))^2, x)
```

3.394 $\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))^2}\,dx = -\frac{(1-c^2x^2)^2}{bcx(a+b\arcsin(cx))} - \frac{9\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2} - \frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2} - \frac{9\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2} - \frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2} - \frac{\text{Int}\left(\frac{1-c^2x^2}{x^2(a+b\arcsin(cx))},x\right)}{bc}$$

```
[Out] -(-c^2*x^2+1)^2/b/c/x/(a+b*arcsin(c*x))-9/4*Ci((a+b*arcsin(c*x))/b)*cos(a/b
)/b^2-3/4*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2-9/4*Si((a+b*arcsin(c*x))
/b)*sin(a/b)/b^2-3/4*Si(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2-Unintegrable(
(-c^2*x^2+1)/x^2/(a+b*arcsin(c*x)),x)/b/c
```

Rubi [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^2/(b*c*x*(a + b*ArcSin[c*x]))) - (9*Cos[a/b]*CosIntegral[(a
 + b*ArcSin[c*x])/b])/(4*b^2) - (3*Cos[(3*a)/b]*CosIntegral[(3*(a + b*ArcSi
```

```
n[c*x]))/b])/(4*b^2) - (9*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(4*b
^2) - (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(4*b^2) - Def
er[Int][(1 - c^2*x^2)/(x^2*(a + b*ArcSin[c*x])), x]/(b*c)
```

Rubi steps

$$\text{integral} = -\frac{(1-c^2x^2)^2}{bcx(a+b\arcsin(cx))} - \frac{\int \frac{1-c^2x^2}{x^2(a+b\arcsin(cx))}\,dx}{bc} - \frac{(3c)\int \frac{1-c^2x^2}{a+b\arcsin(cx)}\,dx}{b}$$

$$= -\frac{(1-c^2x^2)^2}{bcx(a+b\arcsin(cx))} - \frac{3\text{Subst}\left(\int \frac{\cos^3\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{\int \frac{1-c^2x^2}{x^2(a+b\arcsin(cx))}\,dx}{bc}$$

$$= -\frac{(1-c^2x^2)^2}{bcx(a+b\arcsin(cx))} - \frac{3\text{Subst}\left(\int \left(\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x} + \frac{3\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{\int \frac{1-c^2x^2}{x^2(a+b\arcsin(cx))}\,dx}{bc}$$

$$= -\frac{(1-c^2x^2)^2}{bcx(a+b\arcsin(cx))} - \frac{3\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2} - \frac{9\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2} - \frac{\int \frac{1-c^2x^2}{x^2(a+b\arcsin(cx))}\,dx}{bc}$$

$$= -\frac{(1-c^2x^2)^2}{bcx(a+b\arcsin(cx))} - \frac{\int \frac{1-c^2x^2}{x^2(a+b\arcsin(cx))}\,dx}{bc} - \frac{\left(9\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2} - \frac{\left(3\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2} - \frac{\left(9\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2} - \frac{\left(3\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2}$$

$$= -\frac{(1-c^2x^2)^2}{bcx(a+b\arcsin(cx))} - \frac{9\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2} - \frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2} - \frac{9\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2} - \frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2} - \frac{\int \frac{1-c^2x^2}{x^2(a+b\arcsin(cx))}\,dx}{bc}$$

Mathematica [N/A]

Not integrable

Time = 8.85 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))^2}\,dx=\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.15 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{x\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.54

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))^2}\,dx=\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{\left(b\arcsin\left(cx\right)+a\right)^2x}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) +
a^2*x), x)
```

Sympy [N/A]

Not integrable

Time = 3.02 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{(-(cx-1)\,(cx+1))^{\frac{3}{2}}}{x\,(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(3/2)/x/(a+b*asin(c*x))**2,x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.92 (sec) , antiderivative size = 146, normalized size of antiderivative = 5.21

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin(cx)+a)^2x}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
 + a*b*c*x)*integrate((3*c^4*x^4 - 2*c^2*x^2 - 1)/(b^2*c*x^2*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2), x) + 1)/(b^2*c*x*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x(a+b\arcsin(cx))^2}\,dx=\int \frac{{\left(1-c^2\,x^2\right)}^{3/2}}{x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

```
[In] int((1 - c^2*x^2)^(3/2)/(x*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(3/2)/(x*(a + b*asin(c*x))^2), x)
```

3.395 $\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))^2}\,dx = -\frac{(1-c^2x^2)^2}{bcx^2(a+b\arcsin(cx))} - \frac{2\mathrm{Int}\left(\frac{1-c^2x^2}{x^3(a+b\arcsin(cx))},x\right)}{bc} - \frac{2c\mathrm{Int}\left(\frac{1-c^2x^2}{x(a+b\arcsin(cx))},x\right)}{b}$$

```
[Out] -(-c^2*x^2+1)^2/b/c/x^2/(a+b*arcsin(c*x))-2*Unintegrable((-c^2*x^2+1)/x^3/(
a+b*arcsin(c*x)),x)/b/c-2*c*Unintegrable((-c^2*x^2+1)/x/(a+b*arcsin(c*x)),x
)/b
```

Rubi [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^2/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Defer[Int][(1 - c^2*x
^2)/(x^3*(a + b*ArcSin[c*x])), x])/(b*c) - (2*c*Defer[Int][(1 - c^2*x^2)/(x
*(a + b*ArcSin[c*x])), x])/b
```

Rubi steps

$$\text{integral} = -\frac{(1-c^2x^2)^2}{bcx^2(a+b\arcsin(cx))} - \frac{2\int \frac{1-c^2x^2}{x^3(a+b\arcsin(cx))}\,dx}{bc} - \frac{(2c)\int \frac{1-c^2x^2}{x(a+b\arcsin(cx))}\,dx}{b}$$

Mathematica [N/A]

Not integrable

Time = 3.70 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^2*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.14 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{x^2\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.75

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{\left(b\arcsin\left(cx\right)+a\right)^2x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x
) + a^2*x^2), x)
```

Sympy [N/A]

Not integrable

Time = 2.94 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))^2}\,dx=\int \frac{(-(cx-1)\,(cx+1))^{\frac{3}{2}}}{x^2\,(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**2/(a+b*asin(c*x))**2,x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**2*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.93 (sec) , antiderivative size = 146, normalized size of antiderivative = 5.21

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))^2}\,dx=\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin\,(cx)+a)^2x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)) + a*b*c*x^2)*integrate(2*(c^4*x^4 - 1)/(b^2*c*x^3*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) + a*b*c*x^3), x) + 1)/(b^2*c*x^2*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)) + a*b*c*x^2)
```

Giac [N/A]

Not integrable

Time = 0.80 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))^2}\,dx=\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin\,(cx)+a)^2x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)^2*x^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^2(a+b\arcsin(cx))^2}\,dx=\int \frac{{\left(1-c^2\,x^2\right)}^{3/2}}{x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

```
[In] int((1 - c^2*x^2)^(3/2)/(x^2*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(3/2)/(x^2*(a + b*asin(c*x))^2), x)
```

3.396 $\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 13.52 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.53 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{x^3\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.75

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{\left(b\arcsin\left(cx\right)+a\right)^2x^3}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*x^3*arcsin(c*x)^2 + 2*a*b*x^3*arcsin(c*x
) + a^2*x^3), x)
```

Sympy [N/A]

Not integrable

Time = 3.82 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))^2}\,dx = \int \frac{(-(cx-1)\,(cx+1))^{\frac{3}{2}}}{x^3\,(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**3/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**3*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.94 (sec) , antiderivative size = 153, normalized size of antiderivative = 5.46

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin(cx)+a)^2x^3}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)) + a*b*c*x^3)*integrate((c^4*x^4 + 2*c^2*x^2 - 3)/(b^2*c*x^4*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^4), x) + 1)/(b^2*c*x^3*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^3)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^3(a+b\arcsin(cx))^2}\,dx=\int \frac{\left(1-c^2\,x^2\right)^{3/2}}{x^3\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}\,dx$$

```
[In] int((1 - c^2*x^2)^(3/2)/(x^3*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(3/2)/(x^3*(a + b*asin(c*x))^2), x)
```

3.397 $\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))^2}\,dx = -\frac{(1-c^2x^2)^2}{bcx^4(a+b\arcsin(cx))} - \frac{4\text{Int}\left(\frac{1-c^2x^2}{x^5(a+b\arcsin(cx))},x\right)}{bc}$$

```
[Out] -(-c^2*x^2+1)^2/b/c/x^4/(a+b*arcsin(c*x))-4*Unintegrable((-c^2*x^2+1)/x^5/(
a+b*arcsin(c*x)),x)/b/c
```

Rubi [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^2/(b*c*x^4*(a + b*ArcSin[c*x]))) - (4*Defer[Int][(1 - c^2*x
^2)/(x^5*(a + b*ArcSin[c*x])), x])/(b*c)
```

Rubi steps

$$\text{integral} = -\frac{(1-c^2x^2)^2}{bcx^4(a+b\arcsin(cx))} - \frac{4\int \frac{1-c^2x^2}{x^5(a+b\arcsin(cx))}\,dx}{bc}$$

Mathematica [N/A]

Not integrable

Time = 3.16 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[(1 - c^2*x^2)^(3/2)/(x^4*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.28 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{x^4\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.75

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{\left(b\arcsin\left(cx\right)+a\right)^2x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((-c^2*x^2 + 1)^(3/2)/(b^2*x^4*arcsin(c*x)^2 + 2*a*b*x^4*arcsin(c*x
) + a^2*x^4), x)
```

Sympy [N/A]

Not integrable

Time = 5.08 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))^2}\,dx=\int \frac{\left(-(cx-1)\,(cx+1)\right)^{\frac{3}{2}}}{x^4\,(a+b\operatorname{asin}{(cx)})^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(3/2)/x**4/(a+b*asin(c*x))**2,x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(3/2)/(x**4*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.83 (sec) , antiderivative size = 146, normalized size of antiderivative = 5.21

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))^2}\,dx=\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin{(cx)}+a)^2x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -(c^4*x^4 - 2*c^2*x^2 - (b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)) + a*b*c*x^4)*integrate(4*(c^2*x^2 - 1)/(b^2*c*x^5*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) + a*b*c*x^5), x) + 1)/(b^2*c*x^4*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)) + a*b*c*x^4)
```

Giac [N/A]

Not integrable

Time = 2.47 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))^2}\,dx=\int \frac{(-c^2x^2+1)^{\frac{3}{2}}}{(b\arcsin{(cx)}+a)^2x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(3/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate((-c^2*x^2 + 1)^(3/2)/((b*arcsin(c*x) + a)^2*x^4), x)
```

Mupad [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{3/2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{{\left(1-c^2\,x^2\right)}^{3/2}}{x^4\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

```
[In] int((1 - c^2*x^2)^(3/2)/(x^4*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(3/2)/(x^4*(a + b*asin(c*x))^2), x)
```

3.398 $\int \frac{x^m (1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2} dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^m (1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2} dx = \text{Int}\left(\frac{x^m (1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}, x\right)$$

```
[Out] Unintegrable(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m (1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2} dx = \int \frac{x^m (1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2} dx$$

```
[In] Int[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
[Out] Defer[Int][(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\text{integral} = \int \frac{x^m (1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2} dx$$

Mathematica [N/A]

Not integrable

Time = 0.70 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[(x^m*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.83 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^m(-c^2x^2+1)^{\frac{5}{2}}}{(a+b\arcsin(cx))^2}dx$$

```
[In] int(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 59, normalized size of antiderivative = 2.11

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{(-c^2x^2+1)^{\frac{5}{2}}x^m}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)*x^m/(b^2*arcsin(c*x)^
2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{x^m (1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(x**m*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 2.02 (sec) , antiderivative size = 186, normalized size of antiderivative = 6.64

$$\int \frac{x^m (1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}x^m}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] ((c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - 1)*x^m - (b^2*c*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1)) + a*b*c)*integrate(((c^6*m + 6*c^6)*x^6 - 3*(c^4*m + 4*
c^4)*x^4 + 3*(c^2*m + 2*c^2)*x^2 - m)*x^m/(b^2*c*x*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)) + a*b*c*x), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1)) + a*b*c)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^m (1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^m*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m\,\left(1-c^2\,x^2\right)^{5/2}}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}\,dx$$

```
[In] int((x^m*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2,x)
[Out] int((x^m*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2, x)
```

3.399 $\int \frac{x^3(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 278

$$\begin{aligned}\int \frac{x^3(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx =& -\frac{x^3(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} \\ &+ \frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{128b^2c^4} + \frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{32b^2c^4} \\ &- \frac{21\cos\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{256b^2c^4} - \frac{9\cos\left(\frac{9a}{b}\right)\text{CosIntegral}\left(\frac{9(a+b\arcsin(cx))}{b}\right)}{256b^2c^4} \\ &+ \frac{3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{128b^2c^4} + \frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{32b^2c^4} \\ &- \frac{21\sin\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{256b^2c^4} - \frac{9\sin\left(\frac{9a}{b}\right)\text{Si}\left(\frac{9(a+b\arcsin(cx))}{b}\right)}{256b^2c^4}\end{aligned}$$

```
[Out] -x^3*(-c^2*x^2+1)^3/b/c/(a+b*arcsin(c*x))+3/128*Ci((a+b*arcsin(c*x))/b)*cos
(a/b)/b^2/c^4+3/32*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^4-21/256*Ci(7
*(a+b*arcsin(c*x))/b)*cos(7*a/b)/b^2/c^4-9/256*Ci(9*(a+b*arcsin(c*x))/b)*co
s(9*a/b)/b^2/c^4+3/128*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c^4+3/32*Si(3*(
a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^4-21/256*Si(7*(a+b*arcsin(c*x))/b)*sin
(7*a/b)/b^2/c^4-9/256*Si(9*(a+b*arcsin(c*x))/b)*sin(9*a/b)/b^2/c^4
```

Rubi [A] (verified)

Time = 0.65 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.00, number of steps used = 34, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {4799, 4809, 4491, 3384, 3380, 3383}

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{128b^2c^4} + \frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{32b^2c^4} - \frac{21\cos\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{256b^2c^4} - \frac{9\cos\left(\frac{9a}{b}\right)\text{CosIntegral}\left(\frac{9(a+b\arcsin(cx))}{b}\right)}{256b^2c^4} + \frac{3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{128b^2c^4} + \frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{32b^2c^4} - \frac{21\sin\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{256b^2c^4} - \frac{9\sin\left(\frac{9a}{b}\right)\text{Si}\left(\frac{9(a+b\arcsin(cx))}{b}\right)}{256b^2c^4} - \frac{x^3(1-c^2x^2)^3}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(x^3*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^3*(1 - c^2*x^2)^3)/(b*c*(a + b*ArcSin[c*x]))) + (3*Cos[a/b]*CosIntegra
l[(a + b*ArcSin[c*x])/b])/(128*b^2*c^4) + (3*Cos[(3*a)/b]*CosIntegral[(3*(a
 + b*ArcSin[c*x]))/b])/(32*b^2*c^4) - (21*Cos[(7*a)/b]*CosIntegral[(7*(a +
b*ArcSin[c*x]))/b])/(256*b^2*c^4) - (9*Cos[(9*a)/b]*CosIntegral[(9*(a + b*A
rcSin[c*x]))/b])/(256*b^2*c^4) + (3*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x]
)/b])/(128*b^2*c^4) + (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b
])/(32*b^2*c^4) - (21*Sin[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/
(256*b^2*c^4) - (9*Sin[(9*a)/b]*SinIntegral[(9*(a + b*ArcSin[c*x]))/b])/(25
6*b^2*c^4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^3(1-c^2x^2)^3}{bc(a+b\arcsin(cx))}+\frac{3\int\frac{x^2(1-c^2x^2)^2}{a+b\arcsin(cx)}\,dx}{bc}-\frac{(9c)\int\frac{x^4(1-c^2x^2)^2}{a+b\arcsin(cx)}\,dx}{b}\\
&= -\frac{x^3(1-c^2x^2)^3}{bc(a+b\arcsin(cx))}+\frac{3\text{Subst}\left(\int\frac{\cos^5\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^4}\\
&\quad-\frac{9\text{Subst}\left(\int\frac{\cos^5\left(\frac{a}{b}-\frac{x}{b}\right)\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^4}
\end{aligned}$$

$$= -\frac{x^3(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} + \frac{3\text{Subst}\left(\int\left(-\frac{\cos\left(\frac{7a}{b}-\frac{7x}{b}\right)}{64x}-\frac{3\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{64x}-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{64x}+\frac{5\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{64x}\right)dx,x,a+b\arcsin(cx)\right)}{b^2c^4} - \frac{9\text{Subst}\left(\int\left(\frac{\cos\left(\frac{9a}{b}-\frac{9x}{b}\right)}{256x}+\frac{\cos\left(\frac{7a}{b}-\frac{7x}{b}\right)}{256x}-\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{64x}-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{64x}+\frac{3\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{128x}\right)dx,x,a+b\arcsin(cx)\right)}{b^2c^4}$$

$$= -\frac{x^3(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} - \frac{9\text{Subst}\left(\int\frac{\cos\left(\frac{9a}{b}-\frac{9x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{256b^2c^4} - \frac{9\text{Subst}\left(\int\frac{\cos\left(\frac{7a}{b}-\frac{7x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{256b^2c^4} - \frac{3\text{Subst}\left(\int\frac{\cos\left(\frac{7a}{b}-\frac{7x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{64b^2c^4} - \frac{3\text{Subst}\left(\int\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{64b^2c^4} + \frac{9\text{Subst}\left(\int\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{64b^2c^4} - \frac{27\text{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{128b^2c^4} + \frac{15\text{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{64b^2c^4}$$

$$= -\frac{x^3(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} - \frac{\left(27\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{128b^2c^4}$$
$$+ \frac{\left(15\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^4}$$
$$- \frac{\left(3\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^4}$$
$$+ \frac{\left(9\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^4}$$
$$- \frac{\left(9\cos\left(\frac{7a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{7x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{256b^2c^4}$$
$$- \frac{\left(3\cos\left(\frac{7a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{7x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^4}$$
$$- \frac{\left(9\cos\left(\frac{9a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{9x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{256b^2c^4}$$
$$- \frac{\left(27\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{128b^2c^4}$$
$$+ \frac{\left(15\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^4}$$
$$- \frac{\left(3\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^4}$$
$$+ \frac{\left(9\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^4}$$
$$- \frac{\left(9\sin\left(\frac{7a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{7x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{256b^2c^4}$$
$$- \frac{\left(3\sin\left(\frac{7a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{7x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^4}$$
$$- \frac{\left(9\sin\left(\frac{9a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{9x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{256b^2c^4}$$

$$= -\frac{x^3(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} + \frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{128b^2c^4} + \frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{32b^2c^4} - \frac{21\cos\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{256b^2c^4} - \frac{9\cos\left(\frac{9a}{b}\right)\text{CosIntegral}\left(\frac{9(a+b\arcsin(cx))}{b}\right)}{256b^2c^4} + \frac{3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{128b^2c^4} + \frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{32b^2c^4} - \frac{21\sin\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{256b^2c^4} - \frac{9\sin\left(\frac{9a}{b}\right)\text{Si}\left(\frac{9(a+b\arcsin(cx))}{b}\right)}{256b^2c^4}$$

Mathematica [A] (verified)

Time = 1.19 (sec) , antiderivative size = 408, normalized size of antiderivative = 1.47

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = -\frac{256bc^3x^3 - 768bc^5x^5 + 768bc^7x^7 - 256bc^9x^9 - 6(a+b\arcsin(cx))\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right) - 2}{}$$

```
[In] Integrate[(x^3*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/256*(256*b*c^3*x^3 - 768*b*c^5*x^5 + 768*b*c^7*x^7 - 256*b*c^9*x^9 - 6*(
a + b*ArcSin[c*x])*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] - 24*(a + b*ArcS
in[c*x])*Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + 21*a*Cos[(7*a)/b
]*CosIntegral[7*(a/b + ArcSin[c*x])] + 21*b*ArcSin[c*x]*Cos[(7*a)/b]*CosInt
egral[7*(a/b + ArcSin[c*x])] + 9*a*Cos[(9*a)/b]*CosIntegral[9*(a/b + ArcSin
[c*x])] + 9*b*ArcSin[c*x]*Cos[(9*a)/b]*CosIntegral[9*(a/b + ArcSin[c*x])] -
 6*a*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] - 6*b*ArcSin[c*x]*Sin[a/b]*Sin
Integral[a/b + ArcSin[c*x]] - 24*a*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin
[c*x])] - 24*b*ArcSin[c*x]*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])]
+ 21*a*Sin[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])] + 21*b*ArcSin[c*x]*S
in[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*x])] + 9*a*Sin[(9*a)/b]*SinIntegr
al[9*(a/b + ArcSin[c*x])] + 9*b*ArcSin[c*x]*Sin[(9*a)/b]*SinIntegral[9*(a/b
 + ArcSin[c*x])])/(b^2*c^4*(a + b*ArcSin[c*x]))
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 454, normalized size of antiderivative = 1.63

method	result
default	$\frac{6 \arcsin(cx) \operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right) \sin\left(\frac{a}{b}\right) b+6 \arcsin(cx) \operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right) \cos\left(\frac{a}{b}\right) b+24 \arcsin(cx) \operatorname{Si}\left(3 \arcsin(cx)+\frac{3a}{b}\right) \sin\left(\frac{3a}{b}\right) b+24 \operatorname{arc}}{}$

```
[In] int(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/256/c^4*(6*arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b+6*arcsin(c*x)*Ci(ar
csin(c*x)+a/b)*cos(a/b)*b+24*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)
*b+24*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b-9*arcsin(c*x)*Si(9*a
rcsin(c*x)+9*a/b)*sin(9*a/b)*b-9*arcsin(c*x)*Ci(9*arcsin(c*x)+9*a/b)*cos(9*
a/b)*b-21*arcsin(c*x)*Si(7*arcsin(c*x)+7*a/b)*sin(7*a/b)*b-21*arcsin(c*x)*C
i(7*arcsin(c*x)+7*a/b)*cos(7*a/b)*b+6*Si(arcsin(c*x)+a/b)*sin(a/b)*a+6*Ci(a
rcsin(c*x)+a/b)*cos(a/b)*a+24*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a+24*Ci(3*
arcsin(c*x)+3*a/b)*cos(3*a/b)*a-9*Si(9*arcsin(c*x)+9*a/b)*sin(9*a/b)*a-9*Ci
(9*arcsin(c*x)+9*a/b)*cos(9*a/b)*a-21*Si(7*arcsin(c*x)+7*a/b)*sin(7*a/b)*a-
21*Ci(7*arcsin(c*x)+7*a/b)*cos(7*a/b)*a-6*x*b*c-8*sin(3*arcsin(c*x))*b+sin(
9*arcsin(c*x))*b+3*sin(7*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2
```

Fricas [F]

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}x^3}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^7 - 2*c^2*x^5 + x^3)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2
+ 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F]

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3(-(cx-1)(cx+1))^{\frac{5}{2}}}{(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate(x**3*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**3*(-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}x^3}{(b\arcsin(cx)+a)^2}\,dx$$

[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")

[Out] (c^6*x^9 - 3*c^4*x^7 + 3*c^2*x^5 - x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integrate(3*(3*c^6*x^8 - 7*c^4*x^6 + 5*c^2*x^4 - x^2)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2479 vs. $2(260) = 520$.

Time = 0.43 (sec) , antiderivative size = 2479, normalized size of antiderivative = 8.92

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \text{Too large to display}$$

[In] integrate(x^3*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")

[Out] -9*b*arcsin(c*x)*cos(a/b)^9*cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9*b*arcsin(c*x)*cos(a/b)^8*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9*a*cos(a/b)^9*cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9*a*cos(a/b)^8*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 81/4*b*arcsin(c*x)*cos(a/b)^7*cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 21/4*b*arcsin(c*x)*cos(a/b)^7*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 63/4*b*arcsin(c*x)*cos(a/b)^6*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 21/4*b*arcsin(c*x)*cos(a/b)^6*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 81/4*a*cos(a/b)^7*cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 21/4*a*cos(a/b)^7*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 63/4*a*cos(a/b)^6*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 21/4*a*cos(a/b)^6*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 243/16*b*arcsin(c*x)*cos(a/b)^5*cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 147/16*b*arcsin(c*x)*cos(a/b)^5*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 135/16*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 105/16*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b

+ 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + (c^2*x^2 - 1)^4*b*c*x
/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 243/16*a*cos(a/b)^5*cos_integral(9*a/b
+ 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 147/16*a*cos(a/b)^5*c
os_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 135/
16*a*cos(a/b)^4*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsi
n(c*x) + a*b^2*c^4) + 105/16*a*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*a
rcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + (c^2*x^2 - 1)^3*b*c*x/(b^3*
c^4*arcsin(c*x) + a*b^2*c^4) + 135/32*b*arcsin(c*x)*cos(a/b)^3*cos_integral
(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 147/32*b*arcsin
(c*x)*cos(a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) +
a*b^2*c^4) + 3/8*b*arcsin(c*x)*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*
x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 45/32*b*arcsin(c*x)*cos(a/b)^2*sin(
a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4)
- 63/32*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x
))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/8*b*arcsin(c*x)*cos(a/b)^2*sin(a/b
)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 1
35/32*a*cos(a/b)^3*cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
+ a*b^2*c^4) - 147/32*a*cos(a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^
3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/8*a*cos(a/b)^3*cos_integral(3*a/b + 3*ar
csin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 45/32*a*cos(a/b)^2*sin(a/b)*
sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 63/
32*a*cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*arcsi
n(c*x) + a*b^2*c^4) + 3/8*a*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcs
in(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 81/256*b*arcsin(c*x)*cos(a/b)*
cos_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 147
/256*b*arcsin(c*x)*cos(a/b)*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^4*ar
csin(c*x) + a*b^2*c^4) - 9/32*b*arcsin(c*x)*cos(a/b)*cos_integral(3*a/b + 3
*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/128*b*arcsin(c*x)*cos(a
/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9/2
56*b*arcsin(c*x)*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcs
in(c*x) + a*b^2*c^4) + 21/256*b*arcsin(c*x)*sin(a/b)*sin_integral(7*a/b + 7
*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 3/32*b*arcsin(c*x)*sin(a/
b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) +
3/128*b*arcsin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsi
n(c*x) + a*b^2*c^4) - 81/256*a*cos(a/b)*cos_integral(9*a/b + 9*arcsin(c*x))
/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 147/256*a*cos(a/b)*cos_integral(7*a/b
+ 7*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) - 9/32*a*cos(a/b)*cos_in
tegral(3*a/b + 3*arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/128*a*c
os(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) -
9/256*a*sin(a/b)*sin_integral(9*a/b + 9*arcsin(c*x))/(b^3*c^4*arcsin(c*x)
+ a*b^2*c^4) + 21/256*a*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c
^4*arcsin(c*x) + a*b^2*c^4) - 3/32*a*sin(a/b)*sin_integral(3*a/b + 3*arcsin
(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4) + 3/128*a*sin(a/b)*sin_integral(a/
b + arcsin(c*x))/(b^3*c^4*arcsin(c*x) + a*b^2*c^4)

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3\,(1-c^2\,x^2)^{5/2}}{(a+b\,\mathrm{asin}\,(c\,x))^2}\,dx$$

```
[In] int((x^3*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2,x)
[Out] int((x^3*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2, x)
```

3.400 $\int \frac{x^2(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 282

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = -\frac{x^2(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} + \frac{\operatorname{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{16b^2c^3} - \frac{\operatorname{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{8b^2c^3} - \frac{3\operatorname{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{6a}{b}\right)}{16b^2c^3} - \frac{\operatorname{CosIntegral}\left(\frac{8(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{8a}{b}\right)}{16b^2c^3} - \frac{\cos\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} + \frac{\cos\left(\frac{4a}{b}\right)\operatorname{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8b^2c^3} + \frac{3\cos\left(\frac{6a}{b}\right)\operatorname{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} + \frac{\cos\left(\frac{8a}{b}\right)\operatorname{Si}\left(\frac{8(a+b\arcsin(cx))}{b}\right)}{16b^2c^3}$$

```
[Out] -x^2*(-c^2*x^2+1)^3/b/c/(a+b*arcsin(c*x))-1/16*cos(2*a/b)*Si(2*(a+b*arcsin(
c*x))/b)/b^2/c^3+1/8*cos(4*a/b)*Si(4*(a+b*arcsin(c*x))/b)/b^2/c^3+3/16*cos(
6*a/b)*Si(6*(a+b*arcsin(c*x))/b)/b^2/c^3+1/16*cos(8*a/b)*Si(8*(a+b*arcsin(c
*x))/b)/b^2/c^3+1/16*Ci(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b^2/c^3-1/8*Ci(4*
(a+b*arcsin(c*x))/b)*sin(4*a/b)/b^2/c^3-3/16*Ci(6*(a+b*arcsin(c*x))/b)*sin(
6*a/b)/b^2/c^3-1/16*Ci(8*(a+b*arcsin(c*x))/b)*sin(8*a/b)/b^2/c^3
```

Rubi [A] (verified)

Time = 0.54 (sec) , antiderivative size = 282, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {4799, 4809, 4491, 3384, 3380, 3383}

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} - \frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8b^2c^3} - \frac{3\sin\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} - \frac{\sin\left(\frac{8a}{b}\right)\text{CosIntegral}\left(\frac{8(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} - \frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} + \frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8b^2c^3} + \frac{3\cos\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} + \frac{\cos\left(\frac{8a}{b}\right)\text{Si}\left(\frac{8(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} - \frac{x^2(1-c^2x^2)^3}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(x^2*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x^2*(1 - c^2*x^2)^3)/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(2*(a + b
*ArcSin[c*x]))/b]*Sin[(2*a)/b])/(16*b^2*c^3) - (CosIntegral[(4*(a + b*ArcSi
n[c*x]))/b]*Sin[(4*a)/b])/(8*b^2*c^3) - (3*CosIntegral[(6*(a + b*ArcSin[c*x
]))/b]*Sin[(6*a)/b])/(16*b^2*c^3) - (CosIntegral[(8*(a + b*ArcSin[c*x]))/b]
*Sin[(8*a)/b])/(16*b^2*c^3) - (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*
x]))/b])/(16*b^2*c^3) + (Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b
])/(8*b^2*c^3) + (3*Cos[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(1
6*b^2*c^3) + (Cos[(8*a)/b]*SinIntegral[(8*(a + b*ArcSin[c*x]))/b])/(16*b^2*
c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^2(1-c^2x^2)^3}{bc(a+b\arcsin(cx))}+\frac{2\int \frac{x(1-c^2x^2)^2}{a+b\arcsin(cx)}\,dx}{bc}-\frac{(8c)\int \frac{x^3(1-c^2x^2)^2}{a+b\arcsin(cx)}\,dx}{b}\\
&= -\frac{x^2(1-c^2x^2)^3}{bc(a+b\arcsin(cx))}-\frac{2\text{Subst}\left(\int \frac{\cos^5\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3}\\
&\quad+\frac{8\text{Subst}\left(\int \frac{\cos^5\left(\frac{a}{b}-\frac{x}{b}\right)\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3}
\end{aligned}$$

$$= -\frac{x^2(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} - \frac{2\text{Subst}\left(\int \left(\frac{\sin\left(\frac{6a}{b}-\frac{6x}{b}\right)}{32x} + \frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8x} + \frac{5\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{32x}\right) dx, x, a+b\arcsin(cx)\right)}{b^2c^3} + \frac{8\text{Subst}\left(\int \left(-\frac{\sin\left(\frac{8a}{b}-\frac{8x}{b}\right)}{128x} - \frac{\sin\left(\frac{6a}{b}-\frac{6x}{b}\right)}{64x} + \frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{64x} + \frac{3\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{64x}\right) dx, x, a+b\arcsin(cx)\right)}{b^2c^3}$$

$$= -\frac{x^2(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} - \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{8a}{b}-\frac{8x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{16b^2c^3} - \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{6a}{b}-\frac{6x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{16b^2c^3} - \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{6a}{b}-\frac{6x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{8b^2c^3} + \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{8b^2c^3} - \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{4b^2c^3} - \frac{5\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{16b^2c^3} + \frac{3\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x} dx, x, a+b\arcsin(cx)\right)}{8b^2c^3}$$

$$= -\frac{x^2(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} + \frac{\left(5\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^3}$$
$$- \frac{\left(3\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^3}$$
$$- \frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^3}$$
$$+ \frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^3}$$
$$+ \frac{\cos\left(\frac{6a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^3}$$
$$+ \frac{\cos\left(\frac{6a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^3}$$
$$+ \frac{\cos\left(\frac{8a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{8x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^3}$$
$$- \frac{\left(5\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^3}$$
$$+ \frac{\left(3\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^3}$$
$$+ \frac{\sin\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^3}$$
$$- \frac{\sin\left(\frac{4a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^3}$$
$$- \frac{\sin\left(\frac{6a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^3}$$
$$- \frac{\sin\left(\frac{6a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^3}$$
$$- \frac{\sin\left(\frac{8a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{8x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^3}$$

$$= -\frac{x^2(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} + \frac{\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{16b^2c^3} - \frac{\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{8b^2c^3} - \frac{3\,\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{6a}{b}\right)}{16b^2c^3} - \frac{\text{CosIntegral}\left(\frac{8(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{8a}{b}\right)}{16b^2c^3} - \frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} + \frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{8b^2c^3} + \frac{3\cos\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{16b^2c^3} + \frac{\cos\left(\frac{8a}{b}\right)\text{Si}\left(\frac{8(a+b\arcsin(cx))}{b}\right)}{16b^2c^3}$$

Mathematica [A] (verified)

Time = 0.95 (sec) , antiderivative size = 414, normalized size of antiderivative = 1.47

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \frac{-16bc^2x^2+48bc^4x^4-48bc^6x^6+16bc^8x^8+(a+b\arcsin(cx))\,\text{CosIntegral}\left(2\left(\frac{a}{b}+\right.\right.}{}$$

```
[In] Integrate[(x^2*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-16*b*c^2*x^2 + 48*b*c^4*x^4 - 48*b*c^6*x^6 + 16*b*c^8*x^8 + (a + b*ArcSin
[c*x])*CosIntegral[2*(a/b + ArcSin[c*x])]*Sin[(2*a)/b] - 2*(a + b*ArcSin[c*
x])*CosIntegral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] - 3*a*CosIntegral[6*(a/
b + ArcSin[c*x])]*Sin[(6*a)/b] - 3*b*ArcSin[c*x]*CosIntegral[6*(a/b + ArcSi
n[c*x])]*Sin[(6*a)/b] - a*CosIntegral[8*(a/b + ArcSin[c*x])]*Sin[(8*a)/b] -
 b*ArcSin[c*x]*CosIntegral[8*(a/b + ArcSin[c*x])]*Sin[(8*a)/b] - a*Cos[(2*a
)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - b*ArcSin[c*x]*Cos[(2*a)/b]*SinInt
egral[2*(a/b + ArcSin[c*x])] + 2*a*Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin
[c*x])] + 2*b*ArcSin[c*x]*Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])] +
 3*a*Cos[(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])] + 3*b*ArcSin[c*x]*Cos[
(6*a)/b]*SinIntegral[6*(a/b + ArcSin[c*x])] + a*Cos[(8*a)/b]*SinIntegral[8*
(a/b + ArcSin[c*x])] + b*ArcSin[c*x]*Cos[(8*a)/b]*SinIntegral[8*(a/b + ArcS
in[c*x])])/(16*b^2*c^3*(a + b*ArcSin[c*x]))
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 478, normalized size of antiderivative = 1.70

method	result
default	$\frac{16\arcsin(cx)\,\mathrm{Si}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)b-16\arcsin(cx)\,\mathrm{Ci}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)b+8\arcsin(cx)\,\mathrm{Si}\left(8\arcsin(cx)+\frac{8a}{b}\right)\cos\left(\frac{8a}{b}\right)}{}$

```
[In] int(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/128/c^3*(16*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-16*arcsin(c*
x)*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b+8*arcsin(c*x)*Si(8*arcsin(c*x)+8*a/
b)*cos(8*a/b)*b-8*arcsin(c*x)*Ci(8*arcsin(c*x)+8*a/b)*sin(8*a/b)*b-8*arcsin
(c*x)*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*b+8*arcsin(c*x)*Ci(2*arcsin(c*x)+2
*a/b)*sin(2*a/b)*b+24*arcsin(c*x)*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*b-24*a
rcsin(c*x)*Ci(6*arcsin(c*x)+6*a/b)*sin(6*a/b)*b+16*Si(4*arcsin(c*x)+4*a/b)*
cos(4*a/b)*a-16*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*a+8*Si(8*arcsin(c*x)+8*a
/b)*cos(8*a/b)*a-8*Ci(8*arcsin(c*x)+8*a/b)*sin(8*a/b)*a-8*Si(2*arcsin(c*x)+
2*a/b)*cos(2*a/b)*a+8*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+24*Si(6*arcsin(c
*x)+6*a/b)*cos(6*a/b)*a-24*Ci(6*arcsin(c*x)+6*a/b)*sin(6*a/b)*a+4*cos(4*arc
sin(c*x))*b+cos(8*arcsin(c*x))*b-4*cos(2*arcsin(c*x))*b+4*cos(6*arcsin(c*x)
)*b-5*b)/(a+b*arcsin(c*x))/b^2
```

Fricas [F]

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{(-c^2x^2+1)^{\frac{5}{2}}x^2}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^6 - 2*c^2*x^4 + x^2)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2
+ 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F]

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{x^2(-(cx-1)(cx+1))^{\frac{5}{2}}}{(a+b\,\mathrm{asin}(cx))^2}\,dx$$

```
[In] integrate(x**2*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2*(-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}x^2}{(b\arcsin(cx)+a)^2}\,dx$$

[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")

[Out] (c^6*x^8 - 3*c^4*x^6 + 3*c^2*x^4 - x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integrate(2*(4*c^6*x^7 - 9*c^4*x^5 + 6*c^2*x^3 - x)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2461 vs. $2(264) = 528$.

Time = 0.44 (sec) , antiderivative size = 2461, normalized size of antiderivative = 8.73

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \text{Too large to display}$$

[In] integrate(x^2*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")

[Out] -8*b*arcsin(c*x)*cos(a/b)^7*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 8*b*arcsin(c*x)*cos(a/b)^8*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 8*a*cos(a/b)^7*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 8*a*cos(a/b)^8*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 12*b*arcsin(c*x)*cos(a/b)^5*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 6*b*arcsin(c*x)*cos(a/b)^5*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 16*b*arcsin(c*x)*cos(a/b)^6*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*b*arcsin(c*x)*cos(a/b)^6*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 12*a*cos(a/b)^5*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 6*a*cos(a/b)^5*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 16*a*cos(a/b)^6*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*a*cos(a/b)^6*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 5*b*arcsin(c*x)*cos(a/b)^3*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 6*b*arcsin(c*x)*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 10*b*arcsin(c*x)*cos(a/b)^4*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsi

```
n(c*x) + a*b^2*c^3) - 9*b*arcsin(c*x)*cos(a/b)^4*sin_integral(6*a/b + 6*arc
sin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + b*arcsin(c*x)*cos(a/b)^4*sin_
integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 5*a*cos
(a/b)^3*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) +
 a*b^2*c^3) + 6*a*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(
b^3*c^3*arcsin(c*x) + a*b^2*c^3) - a*cos(a/b)^3*cos_integral(4*a/b + 4*arcs
in(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 10*a*cos(a/b)^4*sin_i
ntegral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9*a*cos(
a/b)^4*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3
) + a*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) +
 a*b^2*c^3) + (c^2*x^2 - 1)^4*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/2*b*a
rcsin(c*x)*cos(a/b)*cos_integral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*a
rcsin(c*x) + a*b^2*c^3) - 9/8*b*arcsin(c*x)*cos(a/b)*cos_integral(6*a/b + 6
*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/2*b*arcsin(c*x
)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x
) + a*b^2*c^3) + 1/8*b*arcsin(c*x)*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c
*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*b*arcsin(c*x)*cos(a/b)^
2*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 2
7/8*b*arcsin(c*x)*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*a
rcsin(c*x) + a*b^2*c^3) - b*arcsin(c*x)*cos(a/b)^2*sin_integral(4*a/b + 4*a
rcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 1/8*b*arcsin(c*x)*cos(a/b)^
2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + (
c^2*x^2 - 1)^3*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/2*a*cos(a/b)*cos_int
egral(8*a/b + 8*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9
/8*a*cos(a/b)*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(
c*x) + a*b^2*c^3) + 1/2*a*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(
a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/8*a*cos(a/b)*cos_integral(2*a/b
+ 2*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*a*cos(a/b)^
2*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 2
7/8*a*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) +
 a*b^2*c^3) - a*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arc
sin(c*x) + a*b^2*c^3) - 1/8*a*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x)
)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/16*b*arcsin(c*x)*sin_integral(8*a/b
 + 8*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 3/16*b*arcsin(c*x)*si
n_integral(6*a/b + 6*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/8*b
*arcsin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b
^2*c^3) + 1/16*b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*a
rcsin(c*x) + a*b^2*c^3) + 1/16*a*sin_integral(8*a/b + 8*arcsin(c*x))/(b^3*c
^3*arcsin(c*x) + a*b^2*c^3) - 3/16*a*sin_integral(6*a/b + 6*arcsin(c*x))/(b
^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/8*a*sin_integral(4*a/b + 4*arcsin(c*x))
/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/16*a*sin_integral(2*a/b + 2*arcsin(c
*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2\,(1-c^2\,x^2)^{5/2}}{(a+b\,\mathrm{asin}\,(c\,x))^2}\,dx$$

```
[In] int((x^2*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2,x)
[Out] int((x^2*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2, x)
```

3.401 $\int \frac{x(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 276

$$\begin{aligned}\int \frac{x(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx &= -\frac{x(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} \\ &+ \frac{5\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64b^2c^2} + \frac{27\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64b^2c^2} \\ &+ \frac{25\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64b^2c^2} + \frac{7\cos\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64b^2c^2} \\ &+ \frac{5\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64b^2c^2} + \frac{27\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64b^2c^2} \\ &+ \frac{25\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64b^2c^2} + \frac{7\sin\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64b^2c^2}\end{aligned}$$

```
[Out] -x*(-c^2*x^2+1)^3/b/c/(a+b*arcsin(c*x))+5/64*Ci((a+b*arcsin(c*x))/b)*cos(a/
b)/b^2/c^2+27/64*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^2+25/64*Ci(5*(a
+b*arcsin(c*x))/b)*cos(5*a/b)/b^2/c^2+7/64*Ci(7*(a+b*arcsin(c*x))/b)*cos(7*
a/b)/b^2/c^2+5/64*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c^2+27/64*Si(3*(a+b*
arcsin(c*x))/b)*sin(3*a/b)/b^2/c^2+25/64*Si(5*(a+b*arcsin(c*x))/b)*sin(5*a/
b)/b^2/c^2+7/64*Si(7*(a+b*arcsin(c*x))/b)*sin(7*a/b)/b^2/c^2
```

Rubi [A] (verified)

Time = 0.49 (sec) , antiderivative size = 276, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {4799, 4753, 3393, 3384, 3380, 3383, 4809, 4491}

$$\begin{aligned}\int \frac{x(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx &= \frac{5\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64b^2c^2}\\ &+\frac{27\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64b^2c^2}+\frac{25\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64b^2c^2}\\ &+\frac{7\cos\left(\frac{7a}{b}\right)\text{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64b^2c^2}+\frac{5\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64b^2c^2}\\ &+\frac{27\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64b^2c^2}+\frac{25\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64b^2c^2}\\ &+\frac{7\sin\left(\frac{7a}{b}\right)\text{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64b^2c^2}-\frac{x(1-c^2x^2)^3}{bc(a+b\arcsin(cx))}\end{aligned}$$

```
[In] Int[(x*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((x*(1 - c^2*x^2)^3)/(b*c*(a + b*ArcSin[c*x]))) + (5*Cos[a/b]*CosIntegral[
(a + b*ArcSin[c*x])/b])/(64*b^2*c^2) + (27*Cos[(3*a)/b]*CosIntegral[(3*(a +
 b*ArcSin[c*x]))/b])/(64*b^2*c^2) + (25*Cos[(5*a)/b]*CosIntegral[(5*(a + b*
ArcSin[c*x]))/b])/(64*b^2*c^2) + (7*Cos[(7*a)/b]*CosIntegral[(7*(a + b*ArcS
in[c*x]))/b])/(64*b^2*c^2) + (5*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b]
)/(64*b^2*c^2) + (27*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(
64*b^2*c^2) + (25*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(64*
b^2*c^2) + (7*Sin[(7*a)/b]*SinIntegral[(7*(a + b*ArcSin[c*x]))/b])/(64*b^2*
c^2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{x(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} + \frac{\int \frac{(1-c^2x^2)^2}{a+b\arcsin(cx)}\,dx}{bc} - \frac{(7c)\int \frac{x^2(1-c^2x^2)^2}{a+b\arcsin(cx)}\,dx}{b}$$

$$= -\frac{x(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} + \frac{\text{Subst}\left(\int \frac{\cos^5\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^2} - \frac{7\text{Subst}\left(\int \frac{\cos^5\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^2}$$

$$= -\frac{x(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} + \frac{\text{Subst}\left(\int \left(\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x} + \frac{5\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x} + \frac{5\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right) dx, x, a+b\arcsin(cx)\right)}{b^2c^2} - \frac{7\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{7a}{b}-\frac{7x}{b}\right)}{64x} - \frac{3\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{64x} - \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{64x} + \frac{5\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{64x}\right) dx, x, a+b\arcsin(cx)\right)}{b^2c^2}$$

$$= -\frac{x(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} + \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^2} + \frac{7\text{Subst}\left(\int \frac{\cos\left(\frac{7a}{b}-\frac{7x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^2} + \frac{7\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^2} + \frac{5\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^2} + \frac{21\text{Subst}\left(\int \frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^2} - \frac{35\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^2} + \frac{5\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^2}$$

$$= -\frac{x(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} - \frac{\left(35\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^2}$$
$$+ \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^2}$$
$$+ \frac{\left(7\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^2}$$
$$+ \frac{\left(5\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^2}$$
$$+ \frac{\cos\left(\frac{5a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^2}$$
$$+ \frac{\left(21\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^2}$$
$$+ \frac{\left(7\cos\left(\frac{7a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{7x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^2}$$
$$- \frac{\left(35\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^2}$$
$$+ \frac{\left(5\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^2}$$
$$+ \frac{\left(7\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^2}$$
$$+ \frac{\left(5\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^2}$$
$$+ \frac{\sin\left(\frac{5a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^2}$$
$$+ \frac{\left(21\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^2}$$
$$+ \frac{\left(7\sin\left(\frac{7a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{7x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{64b^2c^2}$$

$$
= -\frac{x(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} + \frac{5\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64b^2c^2} + \frac{27\cos\left(\frac{3a}{b}\right)\operatorname{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64b^2c^2} + \frac{25\cos\left(\frac{5a}{b}\right)\operatorname{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64b^2c^2} + \frac{7\cos\left(\frac{7a}{b}\right)\operatorname{CosIntegral}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64b^2c^2} + \frac{5\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{64b^2c^2} + \frac{27\sin\left(\frac{3a}{b}\right)\operatorname{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{64b^2c^2} + \frac{25\sin\left(\frac{5a}{b}\right)\operatorname{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{64b^2c^2} + \frac{7\sin\left(\frac{7a}{b}\right)\operatorname{Si}\left(\frac{7(a+b\arcsin(cx))}{b}\right)}{64b^2c^2}
$$

Mathematica [A] (verified)

Time = 0.81 (sec) , antiderivative size = 404, normalized size of antiderivative = 1.46

$$
\int \frac{x(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \frac{-64bcx+192bc^3x^3-192bc^5x^5+64bc^7x^7+5(a+b\arcsin(cx))\cos\left(\frac{a}{b}\right)\operatorname{CosIntegr}}{}
$$

```
[In] Integrate[(x*(1 - c^2*x^2)^(5/2))/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-64*b*c*x + 192*b*c^3*x^3 - 192*b*c^5*x^5 + 64*b*c^7*x^7 + 5*(a + b*ArcSin
[c*x])*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + 27*(a + b*ArcSin[c*x])*Cos
[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + 25*a*Cos[(5*a)/b]*CosIntegra
l[5*(a/b + ArcSin[c*x])] + 25*b*ArcSin[c*x]*Cos[(5*a)/b]*CosIntegral[5*(a/b
 + ArcSin[c*x])] + 7*a*Cos[(7*a)/b]*CosIntegral[7*(a/b + ArcSin[c*x])] + 7*
b*ArcSin[c*x]*Cos[(7*a)/b]*CosIntegral[7*(a/b + ArcSin[c*x])] + 5*a*Sin[a/b
]*SinIntegral[a/b + ArcSin[c*x]] + 5*b*ArcSin[c*x]*Sin[a/b]*SinIntegral[a/b
 + ArcSin[c*x]] + 27*a*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 27
*b*ArcSin[c*x]*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 25*a*Sin[(
5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])] + 25*b*ArcSin[c*x]*Sin[(5*a)/b]*
SinIntegral[5*(a/b + ArcSin[c*x])] + 7*a*Sin[(7*a)/b]*SinIntegral[7*(a/b +
ArcSin[c*x])] + 7*b*ArcSin[c*x]*Sin[(7*a)/b]*SinIntegral[7*(a/b + ArcSin[c*
x])])/(64*b^2*c^2*(a + b*ArcSin[c*x]))
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 455, normalized size of antiderivative = 1.65

method	result
default	$\frac{7\arcsin(cx)\,\mathrm{Si}\left(7\arcsin(cx)+\frac{7a}{b}\right)\sin\left(\frac{7a}{b}\right)b+7\arcsin(cx)\,\mathrm{Ci}\left(7\arcsin(cx)+\frac{7a}{b}\right)\cos\left(\frac{7a}{b}\right)b+25\arcsin(cx)\,\mathrm{Si}\left(5\arcsin(cx)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)b-}{}$

[In] int(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)

[Out] 1/64/c^2*(7*arcsin(c*x)*Si(7*arcsin(c*x)+7*a/b)*sin(7*a/b)*b+7*arcsin(c*x)*Ci(7*arcsin(c*x)+7*a/b)*cos(7*a/b)*b+25*arcsin(c*x)*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*b+25*arcsin(c*x)*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b+27*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b+27*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b+5*arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b+5*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+7*Si(7*arcsin(c*x)+7*a/b)*sin(7*a/b)*a+7*Ci(7*arcsin(c*x)+7*a/b)*cos(7*a/b)*a+25*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*a+25*Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*a+27*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a+27*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a+5*Si(arcsin(c*x)+a/b)*sin(a/b)*a+5*Ci(arcsin(c*x)+a/b)*cos(a/b)*a-5*x*b*c-sin(7*arcsin(c*x))*b-5*sin(5*arcsin(c*x))*b-9*sin(3*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2

Fricas [F]

$$\int \frac{x(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}x}{(b\arcsin(cx)+a)^2}\,dx$$

[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")

[Out] integral((c^4*x^5 - 2*c^2*x^3 + x)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)

Sympy [F]

$$\int \frac{x(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{x(-(cx-1)(cx+1))^{\frac{5}{2}}}{(a+b\,\mathrm{asin}(cx))^2}\,dx$$

[In] integrate(x*(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)

[Out] Integral(x*(-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x))**2, x)

Maxima [F]

$$\int \frac{x(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}x}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^7 - 3*c^4*x^5 + 3*c^2*x^3 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1)) + a*b*c)*integrate((7*c^6*x^6 - 15*c^4*x^4 + 9*c^2*x^2 - 1)/(b^2*
c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x) - x)/(b^2*c*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2026 vs. 2(258) = 516.

Time = 0.42 (sec) , antiderivative size = 2026, normalized size of antiderivative = 7.34

$$\int \frac{x(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \text{Too large to display}$$

```
[In] integrate(x*(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 7*b*arcsin(c*x)*cos(a/b)^7*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arc
sin(c*x) + a*b^2*c^2) + 7*b*arcsin(c*x)*cos(a/b)^6*sin(a/b)*sin_integral(7*
a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 7*a*cos(a/b)^7*cos
_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 7*a*co
s(a/b)^6*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x)
+ a*b^2*c^2) - 49/4*b*arcsin(c*x)*cos(a/b)^5*cos_integral(7*a/b + 7*arcsin(
c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/4*b*arcsin(c*x)*cos(a/b)^5*cos
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 35/4*b
*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c
^2*arcsin(c*x) + a*b^2*c^2) + 25/4*b*arcsin(c*x)*cos(a/b)^4*sin(a/b)*sin_in
tegral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 49/4*a*co
s(a/b)^5*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c
^2) + 25/4*a*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin
(c*x) + a*b^2*c^2) - 35/4*a*cos(a/b)^4*sin(a/b)*sin_integral(7*a/b + 7*arcs
in(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/4*a*cos(a/b)^4*sin(a/b)*sin
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + (c^2*x
^2 - 1)^3*b*c*x/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 49/8*b*arcsin(c*x)*cos(
a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2
) - 125/16*b*arcsin(c*x)*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(c*x))/(b^
3*c^2*arcsin(c*x) + a*b^2*c^2) + 27/16*b*arcsin(c*x)*cos(a/b)^3*cos_integra
l(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 21/8*b*arcsin(
```

```
c*x)*cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsi
n(c*x) + a*b^2*c^2) - 75/16*b*arcsin(c*x)*cos(a/b)^2*sin(a/b)*sin_integral(
5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 27/16*b*arcsin(c
*x)*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin
(c*x) + a*b^2*c^2) + 49/8*a*cos(a/b)^3*cos_integral(7*a/b + 7*arcsin(c*x))/
(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 125/16*a*cos(a/b)^3*cos_integral(5*a/b
+ 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 27/16*a*cos(a/b)^3*cos
_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 21/8*a
*cos(a/b)^2*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*
x) + a*b^2*c^2) - 75/16*a*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*arcsin
(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 27/16*a*cos(a/b)^2*sin(a/b)*sin_
integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 49/64*b
*arcsin(c*x)*cos(a/b)*cos_integral(7*a/b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c
*x) + a*b^2*c^2) + 125/64*b*arcsin(c*x)*cos(a/b)*cos_integral(5*a/b + 5*arc
sin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 81/64*b*arcsin(c*x)*cos(a/b)*
cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5/6
4*b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*
x) + a*b^2*c^2) - 7/64*b*arcsin(c*x)*sin(a/b)*sin_integral(7*a/b + 7*arcsin
(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 25/64*b*arcsin(c*x)*sin(a/b)*sin
_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 27/64*
b*arcsin(c*x)*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(
c*x) + a*b^2*c^2) + 5/64*b*arcsin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c
*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 49/64*a*cos(a/b)*cos_integral(7*a/
b + 7*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 125/64*a*cos(a/b)*co
s_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 81/64
*a*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^
2*c^2) + 5/64*a*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*
x) + a*b^2*c^2) - 7/64*a*sin(a/b)*sin_integral(7*a/b + 7*arcsin(c*x))/(b^3*
c^2*arcsin(c*x) + a*b^2*c^2) + 25/64*a*sin(a/b)*sin_integral(5*a/b + 5*arcs
in(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - 27/64*a*sin(a/b)*sin_integral(
3*a/b + 3*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 5/64*a*sin(a/b)*
sin_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{x\,{\left(1-c^2\,x^2\right)}^{5/2}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

```
[In] int((x*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2,x)
[Out] int((x*(1 - c^2*x^2)^(5/2))/(a + b*asin(c*x))^2, x)
```

3.402 $\int \frac{(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 217

$$\int \frac{(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = -\frac{(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} + \frac{15\,\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{16b^2c} + \frac{3\,\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{4b^2c} + \frac{3\,\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{6a}{b}\right)}{16b^2c} - \frac{15\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{16b^2c} - \frac{3\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{4b^2c} - \frac{3\cos\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{16b^2c}$$

```
[Out] -(-c^2*x^2+1)^3/b/c/(a+b*arcsin(c*x))-15/16*cos(2*a/b)*Si(2*(a+b*arcsin(c*x
))/b)/b^2/c-3/4*cos(4*a/b)*Si(4*(a+b*arcsin(c*x))/b)/b^2/c-3/16*cos(6*a/b)*
Si(6*(a+b*arcsin(c*x))/b)/b^2/c+15/16*Ci(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/
b^2/c+3/4*Ci(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b^2/c+3/16*Ci(6*(a+b*arcsin(
c*x))/b)*sin(6*a/b)/b^2/c
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used

= {4751, 4809, 4491, 3384, 3380, 3383}

$$\int \frac{(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \frac{15\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{16b^2c} + \frac{3\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{4b^2c} + \frac{3\sin\left(\frac{6a}{b}\right)\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{16b^2c} - \frac{15\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{16b^2c} - \frac{3\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{4b^2c} - \frac{3\cos\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{16b^2c} - \frac{(1-c^2x^2)^3}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(1 - c^2*x^2)^(5/2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((1 - c^2*x^2)^3/(b*c*(a + b*ArcSin[c*x]))) + (15*CosIntegral[(2*(a + b*Ar
cSin[c*x]))/b]*Sin[(2*a)/b])/(16*b^2*c) + (3*CosIntegral[(4*(a + b*ArcSin[c
*x]))/b]*Sin[(4*a)/b])/(4*b^2*c) + (3*CosIntegral[(6*(a + b*ArcSin[c*x]))/b
]*Sin[(6*a)/b])/(16*b^2*c) - (15*Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[
c*x]))/b])/(16*b^2*c) - (3*Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))
/b])/(4*b^2*c) - (3*Cos[(6*a)/b]*SinIntegral[(6*(a + b*ArcSin[c*x]))/b])/(1
6*b^2*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
```

```
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} - \frac{(6c)\int \frac{x(1-c^2x^2)^2}{a+b\arcsin(cx)}\,dx}{b} \\
&= -\frac{(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} + \frac{6\text{Subst}\left(\int \frac{\cos^5\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c} \\
&= -\frac{(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} \\
&\quad + \frac{6\text{Subst}\left(\int \left(\frac{\sin\left(\frac{6a}{b}-\frac{6x}{b}\right)}{32x} + \frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8x} + \frac{5\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{32x}\right)\,dx, x, a+b\arcsin(cx)\right)}{b^2c} \\
&= -\frac{(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} + \frac{3\text{Subst}\left(\int \frac{\sin\left(\frac{6a}{b}-\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c} \\
&\quad + \frac{3\text{Subst}\left(\int \frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c} \\
&\quad + \frac{15\text{Subst}\left(\int \frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c}
\end{aligned}$$

$$= -\frac{(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} - \frac{\left(15\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c}$$
$$- \frac{\left(3\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c}$$
$$- \frac{\left(3\cos\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c}$$
$$+ \frac{\left(15\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c}$$
$$+ \frac{\left(3\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c}$$
$$+ \frac{\left(3\sin\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{6x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c}$$

$$= -\frac{(1-c^2x^2)^3}{bc(a+b\arcsin(cx))} + \frac{15\,\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{16b^2c}$$
$$+ \frac{3\,\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{4b^2c}$$
$$+ \frac{3\,\text{CosIntegral}\left(\frac{6(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{6a}{b}\right)}{16b^2c} - \frac{15\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{16b^2c}$$
$$- \frac{3\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{4b^2c} - \frac{3\cos\left(\frac{6a}{b}\right)\text{Si}\left(\frac{6(a+b\arcsin(cx))}{b}\right)}{16b^2c}$$

Mathematica [A] (verified)

Time = 0.70 (sec) , antiderivative size = 311, normalized size of antiderivative = 1.43

$$\int \frac{(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx =$$
$$-\frac{16b - 48bc^2x^2 + 48bc^4x^4 - 16bc^6x^6 - 15(a+b\arcsin(cx))\,\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{2a}{b}\right) - 12(}{}$$

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/16*(16*b - 48*b*c^2*x^2 + 48*b*c^4*x^4 - 16*b*c^6*x^6 - 15*(a + b*ArcSin
[c*x])*CosIntegral[2*(a/b + ArcSin[c*x])]*Sin[(2*a)/b] - 12*(a + b*ArcSin[c
*x])*CosIntegral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] - 3*a*CosIntegral[6*(a
/b + ArcSin[c*x])]*Sin[(6*a)/b] - 3*b*ArcSin[c*x]*CosIntegral[6*(a/b + ArcS
in[c*x])]*Sin[(6*a)/b] + 15*a*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x]
)] + 15*b*ArcSin[c*x]*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] + 12*
```

```
a*Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])] + 12*b*ArcSin[c*x]*Cos[(4
*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])] + 3*a*Cos[(6*a)/b]*SinIntegral[6*
(a/b + ArcSin[c*x])] + 3*b*ArcSin[c*x]*Cos[(6*a)/b]*SinIntegral[6*(a/b + Ar
cSin[c*x])])/(b^2*c*(a + b*ArcSin[c*x]))
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 364, normalized size of antiderivative = 1.68

method	result
default	$-\frac{6 \arcsin(cx) \operatorname{Si}\left(6 \arcsin(cx)+\frac{6a}{b}\right) \cos\left(\frac{6a}{b}\right) b-6 \arcsin(cx) \operatorname{Ci}\left(6 \arcsin(cx)+\frac{6a}{b}\right) \sin\left(\frac{6a}{b}\right) b+24 \arcsin(cx) \operatorname{Si}\left(4 \arcsin(cx)+\frac{4a}{b}\right) \cos\left(\frac{4a}{b}\right) b}{}$

```
[In] int((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/32/c*(6*arcsin(c*x)*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*b-6*arcsin(c*x)*C
i(6*arcsin(c*x)+6*a/b)*sin(6*a/b)*b+24*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*
cos(4*a/b)*b-24*arcsin(c*x)*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b+30*arcsin(
c*x)*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*b-30*arcsin(c*x)*Ci(2*arcsin(c*x)+2
*a/b)*sin(2*a/b)*b+6*Si(6*arcsin(c*x)+6*a/b)*cos(6*a/b)*a-6*Ci(6*arcsin(c*x
)+6*a/b)*sin(6*a/b)*a+24*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*a-24*Ci(4*arcsi
n(c*x)+4*a/b)*sin(4*a/b)*a+30*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*a-30*Ci(2*
arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(6*arcsin(c*x))*b+6*cos(4*arcsin(c*x))*b
+15*cos(2*arcsin(c*x))*b+10*b)/(a+b*arcsin(c*x))/b^2
```

Fricas [F]

$$\int \frac{(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*arcsin(c*x)^2 +
2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F]

$$\int \frac{(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-(cx-1)\,(cx+1))^{\frac{5}{2}}}{(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \frac{(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-
c*x + 1)) + a*b*c)*integrate(6*(c^5*x^5 - 2*c^3*x^3 + c*x)/(b^2*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b), x) - 1)/(b^2*c*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1394 vs. $2(203) = 406$.

Time = 0.40 (sec) , antiderivative size = 1394, normalized size of antiderivative = 6.42

$$\int \frac{(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx = \text{Too large to display}$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] 6*b*arcsin(c*x)*cos(a/b)^5*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^
3*c*arcsin(c*x) + a*b^2*c) - 6*b*arcsin(c*x)*cos(a/b)^6*sin_integral(6*a/b
+ 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 6*a*cos(a/b)^5*cos_integra
l(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) - 6*a*cos(a
/b)^6*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 6
*b*arcsin(c*x)*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3
*c*arcsin(c*x) + a*b^2*c) + 6*b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b +
 4*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 9*b*arcsin(c*x)*co
s(a/b)^4*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
- 6*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arc
sin(c*x) + a*b^2*c) - 6*a*cos(a/b)^3*cos_integral(6*a/b + 6*arcsin(c*x))*si
```

```
n(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 6*a*cos(a/b)^3*cos_integral(4*a/b +
4*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 9*a*cos(a/b)^4*sin_
integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 6*a*cos(a/b
)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 9/8
*b*arcsin(c*x)*cos(a/b)*cos_integral(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c
*arcsin(c*x) + a*b^2*c) - 3*b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*a
rcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) + 15/8*b*arcsin(c*x)*cos
(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b
^2*c) - 27/8*b*arcsin(c*x)*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x))/(
b^3*c*arcsin(c*x) + a*b^2*c) + 6*b*arcsin(c*x)*cos(a/b)^2*sin_integral(4*a/
b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 15/8*b*arcsin(c*x)*cos(a
/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + (
c^2*x^2 - 1)^3*b/(b^3*c*arcsin(c*x) + a*b^2*c) + 9/8*a*cos(a/b)*cos_integra
l(6*a/b + 6*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2*c) - 3*a*cos(a
/b)*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) + a*b^2
*c) + 15/8*a*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c*a
rcsin(c*x) + a*b^2*c) - 27/8*a*cos(a/b)^2*sin_integral(6*a/b + 6*arcsin(c*x
))/(b^3*c*arcsin(c*x) + a*b^2*c) + 6*a*cos(a/b)^2*sin_integral(4*a/b + 4*ar
csin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 15/8*a*cos(a/b)^2*sin_integral(2
*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) + 3/16*b*arcsin(c*x)*si
n_integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c) - 3/4*b*arc
sin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x) + a*b^2*c)
+ 15/16*b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x
) + a*b^2*c) + 3/16*a*sin_integral(6*a/b + 6*arcsin(c*x))/(b^3*c*arcsin(c*x
) + a*b^2*c) - 3/4*a*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c*arcsin(c*x)
 + a*b^2*c) + 15/16*a*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c*arcsin(c*x
) + a*b^2*c)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(1-c^2x^2)^{5/2}}{(a+b\arcsin(cx))^2}\,dx=\int \frac{{\left(1-c^2\,x^2\right)}^{5/2}}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

```
[In] int((1 - c^2*x^2)^(5/2)/(a + b*asin(c*x))^2,x)
[Out] int((1 - c^2*x^2)^(5/2)/(a + b*asin(c*x))^2, x)
```

3.403 $\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\begin{aligned}\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))^2}\,dx &= -\frac{(1-c^2x^2)^3}{bcx(a+b\arcsin(cx))}\\ &-\frac{25\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2}-\frac{25\cos\left(\frac{3a}{b}\right)\operatorname{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2}\\ &-\frac{5\cos\left(\frac{5a}{b}\right)\operatorname{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2}\\ &-\frac{25\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2}-\frac{25\sin\left(\frac{3a}{b}\right)\operatorname{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2}\\ &-\frac{5\sin\left(\frac{5a}{b}\right)\operatorname{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2}-\frac{\operatorname{Int}\left(\frac{(1-c^2x^2)^2}{x^2(a+b\arcsin(cx))},x\right)}{bc}\end{aligned}$$

```
[Out] -(-c^2*x^2+1)^3/b/c/x/(a+b*arcsin(c*x))-25/8*Ci((a+b*arcsin(c*x))/b)*cos(a/
b)/b^2-25/16*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2-5/16*Ci(5*(a+b*arcsin
(c*x))/b)*cos(5*a/b)/b^2-25/8*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2-25/16*Si
(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2-5/16*Si(5*(a+b*arcsin(c*x))/b)*sin(5
*a/b)/b^2-Unintegrable((-c^2*x^2+1)^2/x^2/(a+b*arcsin(c*x)),x)/b/c
```

Rubi [N/A]

Not integrable

Time = 0.31 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^3/(b*c*x*(a + b*ArcSin[c*x]))) - (25*Cos[a/b]*CosIntegral[(
a + b*ArcSin[c*x])/b])/(8*b^2) - (25*Cos[(3*a)/b]*CosIntegral[(3*(a + b*Arc
Sin[c*x]))/b])/(16*b^2) - (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSin[c*x]
))/b])/(16*b^2) - (25*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(8*b^2)
- (25*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(16*b^2) - (5*Si
n[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b^2) - Defer[Int][(1
 - c^2*x^2)^2/(x^2*(a + b*ArcSin[c*x])), x]/(b*c)
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{(1-c^2x^2)^3}{bcx(a+b\arcsin(cx))} - \frac{\int \frac{(1-c^2x^2)^2}{x^2(a+b\arcsin(cx))}\,dx}{bc} - \frac{(5c)\int \frac{(1-c^2x^2)^2}{a+b\arcsin(cx)}\,dx}{b} \\
&= -\frac{(1-c^2x^2)^3}{bcx(a+b\arcsin(cx))} - \frac{5\text{Subst}\left(\int \frac{\cos^5\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{\int \frac{(1-c^2x^2)^2}{x^2(a+b\arcsin(cx))}\,dx}{bc} \\
&= -\frac{(1-c^2x^2)^3}{bcx(a+b\arcsin(cx))} \\
&\quad - \frac{5\text{Subst}\left(\int \left(\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x} + \frac{5\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x} + \frac{5\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right)dx, x, a+b\arcsin(cx)\right)}{b^2} \\
&\quad - \frac{\int \frac{(1-c^2x^2)^2}{x^2(a+b\arcsin(cx))}\,dx}{bc} \\
&= -\frac{(1-c^2x^2)^3}{bcx(a+b\arcsin(cx))} - \frac{5\text{Subst}\left(\int \frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2} \\
&\quad - \frac{25\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2} \\
&\quad - \frac{25\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2} - \frac{\int \frac{(1-c^2x^2)^2}{x^2(a+b\arcsin(cx))}\,dx}{bc}
\end{aligned}$$

$$= -\frac{(1-c^2x^2)^3}{bcx(a+b\arcsin(cx))} - \frac{\int \frac{(1-c^2x^2)^2}{x^2(a+b\arcsin(cx))}\,dx}{bc} - \frac{\left(25\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2} - \frac{\left(25\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2} - \frac{\left(5\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2} - \frac{\left(25\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2} - \frac{\left(25\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2} - \frac{\left(5\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2}$$

$$= -\frac{(1-c^2x^2)^3}{bcx(a+b\arcsin(cx))} - \frac{25\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2} - \frac{25\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2} - \frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2} - \frac{25\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2} - \frac{25\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2} - \frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2} - \frac{\int \frac{(1-c^2x^2)^2}{x^2(a+b\arcsin(cx))}\,dx}{bc}$$

Mathematica [N/A]

Not integrable

Time = 11.46 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.17 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x\,(a+b\arcsin\,(cx))^2}dx$$

```
[In] int((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 60, normalized size of antiderivative = 2.14

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin\,(cx)+a)^2x}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*x*arcsin(c*x)^2
+ 2*a*b*x*arcsin(c*x) + a^2*x), x)
```

Sympy [N/A]

Not integrable

Time = 7.62 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.96

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{(-(cx-1)\,(cx+1))^{\frac{5}{2}}}{x\,(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(5/2)/x/(a+b*asin(c*x))**2,x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 1.04 (sec) , antiderivative size = 161, normalized size of antiderivative = 5.75

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin(cx)+a)^2x}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - (b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1)) + a*b*c*x)*integrate((5*c^6*x^6 - 9*c^4*x^4 + 3*c^2*x^2 + 1)/(b
^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2), x) - 1)/(
b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2\,x^2)^{5/2}}{x\,(a+b\,\mathrm{asin}\,(c\,x))^2}\,dx$$

```
[In] int((1 - c^2*x^2)^(5/2)/(x*(a + b*asin(c*x))^2),x)
```

```
[Out] int((1 - c^2*x^2)^(5/2)/(x*(a + b*asin(c*x))^2), x)
```

3.404 $\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))^2}\,dx = -\frac{(1-c^2x^2)^3}{bcx^2(a+b\arcsin(cx))} - \frac{2\text{Int}\left(\frac{(1-c^2x^2)^2}{x^3(a+b\arcsin(cx))},x\right)}{bc} - \frac{4c\text{Int}\left(\frac{(1-c^2x^2)^2}{x(a+b\arcsin(cx))},x\right)}{b}$$

```
[Out] -(-c^2*x^2+1)^3/b/c/x^2/(a+b*arcsin(c*x))-2*Unintegrable((-c^2*x^2+1)^2/x^3
/(a+b*arcsin(c*x)),x)/b/c-4*c*Unintegrable((-c^2*x^2+1)^2/x/(a+b*arcsin(c*x
)),x)/b
```

Rubi [N/A]

Not integrable

Time = 0.19 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -((1 - c^2*x^2)^3/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Defer[Int][(1 - c^2*x
^2)^2/(x^3*(a + b*ArcSin[c*x])), x])/(b*c) - (4*c*Defer[Int][(1 - c^2*x^2)^
2/(x*(a + b*ArcSin[c*x])), x])/b
```

Rubi steps

$$\text{integral} = -\frac{(1-c^2x^2)^3}{bcx^2(a+b\arcsin(cx))} - \frac{2\int \frac{(1-c^2x^2)^2}{x^3(a+b\arcsin(cx))}\,dx}{bc} - \frac{(4c)\int \frac{(1-c^2x^2)^2}{x(a+b\arcsin(cx))}\,dx}{b}$$

Mathematica [N/A]

Not integrable

Time = 3.22 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))^2}\,dx=\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^2*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.17 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x^2\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 66, normalized size of antiderivative = 2.36

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))^2}\,dx=\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{\left(b\arcsin\left(cx\right)+a\right)^2x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*x^2*arcsin(c*x)^
2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2), x)
```

Sympy [N/A]

Not integrable

Time = 7.95 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))^2}\,dx = \int \frac{(-(cx-1)\,(cx+1))^{\frac{5}{2}}}{x^2\,(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**2/(a+b*asin(c*x))**2,x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x**2*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 1.15 (sec) , antiderivative size = 162, normalized size of antiderivative = 5.79

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin(cx)+a)^2x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - (b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)) + a*b*c*x^2)*integrate(2*(2*c^6*x^6 - 3*c^4*x^4 + 1)/(b^2*c*x
^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^3), x) - 1)/(b^2*c*
x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2)
```

Giac [N/A]

Not integrable

Time = 0.83 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin(cx)+a)^2x^2}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)^2*x^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^2(a+b\arcsin(cx))^2}\,dx = \int \frac{\left(1-c^2\,x^2\right)^{5/2}}{x^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}\,dx$$

```
[In] int((1 - c^2*x^2)^(5/2)/(x^2*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(5/2)/(x^2*(a + b*asin(c*x))^2), x)
```

3.405 $\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.08 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 14.75 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))^2}\,dx=\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^3*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.73 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x^3\,(a+b\arcsin\,(cx))^2}dx$$

```
[In] int((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 66, normalized size of antiderivative = 2.36

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))^2}\,dx=\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin\,(cx)+a)^2x^3}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*x^3*arcsin(c*x)^
2 + 2*a*b*x^3*arcsin(c*x) + a^2*x^3), x)
```

Sympy [N/A]

Not integrable

Time = 7.84 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))^2}\,dx = \int \frac{(-(cx-1)\,(cx+1))^{\frac{5}{2}}}{x^3\,(a+b\operatorname{asin}{(cx)})^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**3/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x**3*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 1.20 (sec) , antiderivative size = 169, normalized size of antiderivative = 6.04

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin{(cx)}+a)^2x^3}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] (c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - (b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)) + a*b*c*x^3)*integrate(3*(c^6*x^6 - c^4*x^4 - c^2*x^2 + 1)/(b
^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^4), x) - 1)/(
b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^3)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^3/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^3(a+b\arcsin(cx))^2}\,dx=\int \frac{{\left(1-c^2\,x^2\right)}^{5/2}}{x^3\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

```
[In] int((1 - c^2*x^2)^(5/2)/(x^3*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(5/2)/(x^3*(a + b*asin(c*x))^2), x)
```

3.406 $\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.08 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 3.86 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[(1 - c^2*x^2)^(5/2)/(x^4*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.31 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{x^4\,(a+b\arcsin\,(cx))^2}dx$$

```
[In] int((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x)
[Out] int((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 66, normalized size of antiderivative = 2.36

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin\,(cx)+a)^2x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((c^4*x^4 - 2*c^2*x^2 + 1)*sqrt(-c^2*x^2 + 1)/(b^2*x^4*arcsin(c*x)^
2 + 2*a*b*x^4*arcsin(c*x) + a^2*x^4), x)
```

Sympy [N/A]

Not integrable

Time = 11.22 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{(-(cx-1)\,(cx+1))^{\frac{5}{2}}}{x^4\,(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

```
[In] integrate((-c**2*x**2+1)**(5/2)/x**4/(a+b*asin(c*x))**2,x)
[Out] Integral((-(c*x - 1)*(c*x + 1))**(5/2)/(x**4*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 1.20 (sec) , antiderivative size = 161, normalized size of antiderivative = 5.75

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin(cx)+a)^2x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (c^6*x^6 - 3*c^4*x^4 + 3*c^2*x^2 - (b^2*c*x^4*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)) + a*b*c*x^4)*integrate(2*(c^6*x^6 - 3*c^2*x^2 + 2)/(b^2*c*x^5
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^5), x) - 1)/(b^2*c*x^
4*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^4)
```

Giac [N/A]

Not integrable

Time = 2.39 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{(-c^2x^2+1)^{\frac{5}{2}}}{(b\arcsin(cx)+a)^2x^4}\,dx$$

```
[In] integrate((-c^2*x^2+1)^(5/2)/x^4/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate((-c^2*x^2 + 1)^(5/2)/((b*arcsin(c*x) + a)^2*x^4), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{(1-c^2x^2)^{5/2}}{x^4(a+b\arcsin(cx))^2}\,dx = \int \frac{(1-c^2\,x^2)^{5/2}}{x^4\,(a+b\,\mathrm{asin}\,(c\,x))^2}\,dx$$

```
[In] int((1 - c^2*x^2)^(5/2)/(x^4*(a + b*asin(c*x))^2),x)
[Out] int((1 - c^2*x^2)^(5/2)/(x^4*(a + b*asin(c*x))^2), x)
```

3.407 $\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{x^m}{bc(a+b\arcsin(cx))}+\frac{m\mathrm{Int}\left(\frac{x^{-1+m}}{a+b\arcsin(cx)},x\right)}{bc}$$

```
[Out] -x^m/b/c/(a+b*arcsin(c*x))+m*Unintegrable(x^(-1+m)/(a+b*arcsin(c*x)),x)/b/c
```

Rubi [N/A]

Not integrable

Time = 0.10 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^m/(b*c*(a + b*ArcSin[c*x]))) + (m*Defer[Int][x^(-1 + m)/(a + b*ArcSin[c
*x]), x])/(b*c)
```

Rubi steps

$$\text{integral} = -\frac{x^m}{bc(a+b\arcsin(cx))}+\frac{m\int \frac{x^{-1+m}}{a+b\arcsin(cx)}\,dx}{bc}$$

Mathematica [N/A]

Not integrable

Time = 1.06 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x^m/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.32 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^m}{(a+b\arcsin(cx))^2\sqrt{-c^2x^2+1}}dx$$

```
[In] int(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
[Out] int(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 80, normalized size of antiderivative = 2.86

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^m}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^m/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 2.75 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^m}{\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate(x**m/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(x**m/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.84 (sec) , antiderivative size = 112, normalized size of antiderivative = 4.00

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^m}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] ((b^2*c*m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*m)*integrate(x
^m/(b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x), x) - x^m
)/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [N/A]

Not integrable

Time = 0.56 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^m}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^m/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(x^m/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m}{(a+b\,\mathrm{asin}\,(c\,x))^2\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(x^m/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
[Out] int(x^m/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.408 $\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 204

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{x^5}{bc(a+b\arcsin(cx))} + \frac{5\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^6} - \frac{15\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^6} + \frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^6} + \frac{5\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^6} - \frac{15\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^6} + \frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^6}$$

```
[Out] -x^5/b/c/(a+b*arcsin(c*x))+5/8*Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b^2/c^6-15/
16*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^6+5/16*Ci(5*(a+b*arcsin(c*x))
/b)*cos(5*a/b)/b^2/c^6+5/8*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c^6-15/16*S
i(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^6+5/16*Si(5*(a+b*arcsin(c*x))/b)*
sin(5*a/b)/b^2/c^6
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 204, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4807, 4731, 4491, 3384, 3380, 3383}

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \frac{5\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^6} - \frac{15\cos\left(\frac{3a}{b}\right)\operatorname{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^6} + \frac{5\cos\left(\frac{5a}{b}\right)\operatorname{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^6} + \frac{5\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^6} - \frac{15\sin\left(\frac{3a}{b}\right)\operatorname{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^6} + \frac{5\sin\left(\frac{5a}{b}\right)\operatorname{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^6} - \frac{x^5}{bc(a+b\arcsin(cx))}$$

```
[In] Int[x^5/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^5/(b*c*(a + b*ArcSin[c*x]))) + (5*Cos[a/b]*CosIntegral[(a + b*ArcSin[c*
x])/b])/(8*b^2*c^6) - (15*Cos[(3*a)/b]*CosIntegral[(3*(a + b*ArcSin[c*x]))/
b])/(16*b^2*c^6) + (5*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSin[c*x]))/b])/
(16*b^2*c^6) + (5*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(8*b^2*c^6)
- (15*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(16*b^2*c^6) + (
5*Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b])/(16*b^2*c^6)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{x^5}{bc(a+b\arcsin(cx))}+\frac{5\int \frac{x^4}{a+b\arcsin(cx)}\,dx}{bc}\\
&= -\frac{x^5}{bc(a+b\arcsin(cx))}+\frac{5\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^6}\\
&= -\frac{x^5}{bc(a+b\arcsin(cx))}\\
&\quad+\frac{5\text{Subst}\left(\int \left(\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x}-\frac{3\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right)\,dx,x,a+b\arcsin(cx)\right)}{b^2c^6}\\
&= -\frac{x^5}{bc(a+b\arcsin(cx))}+\frac{5\text{Subst}\left(\int \frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16b^2c^6}\\
&\quad+\frac{5\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8b^2c^6}\\
&\quad-\frac{15\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16b^2c^6}
\end{aligned}
$$

$$= -\frac{x^5}{bc(a+b\arcsin(cx))} + \frac{\left(5\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^6} - \frac{\left(15\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^6} + \frac{\left(5\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^6} + \frac{\left(5\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^6} - \frac{\left(15\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^6} + \frac{\left(5\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^6}$$

$$= -\frac{x^5}{bc(a+b\arcsin(cx))} + \frac{5\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^6} - \frac{15\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^6} + \frac{5\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^6} + \frac{5\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^6} - \frac{15\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^6} + \frac{5\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^6}$$

Mathematica [A] (verified)

Time = 0.31 (sec) , antiderivative size = 157, normalized size of antiderivative = 0.77

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{x^5}{bc(a+b\arcsin(cx))} + \frac{5\left(2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right) - 3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right) + \cos\left(\frac{5a}{b}\right)\text{CosIn}\right.}{}$$

```
[In] Integrate[x^5/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^5/(b*c*(a + b*ArcSin[c*x]))) + (5*(2*Cos[a/b]*CosIntegral[a/b + ArcSin[
c*x]] - 3*Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + Cos[(5*a)/b]*Co
sIntegral[5*(a/b + ArcSin[c*x])] + 2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]
] - 3*Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + Sin[(5*a)/b]*SinInt
egral[5*(a/b + ArcSin[c*x])]))/(16*b^2*c^6)
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 341, normalized size of antiderivative = 1.67

method	result
default	$5 \arcsin(cx) \operatorname{Si}\left(5 \arcsin(cx)+\frac{5a}{b}\right) \sin\left(\frac{5a}{b}\right) b+5 \arcsin(cx) \operatorname{Ci}\left(5 \arcsin(cx)+\frac{5a}{b}\right) \cos\left(\frac{5a}{b}\right) b-15 \arcsin(cx) \operatorname{Si}\left(3 \arcsin(cx)+\frac{3a}{b}\right) \sin\left(\frac{3a}{b}\right) b-1$

```
[In] int(x^5/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/16/c^6*(5*arcsin(c*x)*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*b+5*arcsin(c*x)*
Ci(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b-15*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)
*sin(3*a/b)*b-15*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b+10*arcsin
(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b+10*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos
(a/b)*b+5*Si(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*a+5*Ci(5*arcsin(c*x)+5*a/b)*co
s(5*a/b)*a-15*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a-15*Ci(3*arcsin(c*x)+3*a/
b)*cos(3*a/b)*a+10*Si(arcsin(c*x)+a/b)*sin(a/b)*a+10*Ci(arcsin(c*x)+a/b)*co
s(a/b)*a-10*x*b*c-sin(5*arcsin(c*x))*b+5*sin(3*arcsin(c*x))*b)/(a+b*arcsin(
c*x))/b^2
```

Fricas [F]

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^5}{\sqrt{-c^2x^2+1}\,(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^5/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^5/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F]

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^5}{\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate(x**5/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**5/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Maxima [F]

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^5}{\sqrt{-c^2x^2+1}{\left(b\arcsin\left(cx\right)+a\right)}^2}\,dx$$

[In] integrate(x^5/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] -(x^5 - 5*(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integrate(x^4/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)

Giac [F(-2)]

Exception generated.

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

[In] integrate(x^5/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{x^5}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^5}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{1-c^2\,x^2}}\,dx$$

[In] int(x^5/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)

[Out] int(x^5/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)

3.409 $\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 141

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{x^4}{bc(a+b\arcsin(cx))} - \frac{\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^2c^5} + \frac{\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{2b^2c^5} + \frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^5} - \frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{2b^2c^5}$$

```
[Out] -x^4/b/c/(a+b*arcsin(c*x))+cos(2*a/b)*Si(2*(a+b*arcsin(c*x))/b)/b^2/c^5-1/2
*cos(4*a/b)*Si(4*(a+b*arcsin(c*x))/b)/b^2/c^5-Ci(2*(a+b*arcsin(c*x))/b)*sin
(2*a/b)/b^2/c^5+1/2*Ci(4*(a+b*arcsin(c*x))/b)*sin(4*a/b)/b^2/c^5
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used

$= \{4807, 4731, 4491, 3384, 3380, 3383\}$

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^5} + \frac{\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{2b^2c^5} + \frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^5} - \frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{2b^2c^5} - \frac{x^4}{bc(a+b\arcsin(cx))}$$

```
[In] Int[x^4/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^4/(b*c*(a + b*ArcSin[c*x]))) - (CosIntegral[(2*(a + b*ArcSin[c*x]))/b]*
Sin[(2*a)/b])/(b^2*c^5) + (CosIntegral[(4*(a + b*ArcSin[c*x]))/b]*Sin[(4*a)
/b])/(2*b^2*c^5) + (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(b
^2*c^5) - (Cos[(4*a)/b]*SinIntegral[(4*(a + b*ArcSin[c*x]))/b])/(2*b^2*c^5)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^4}{bc(a+b\arcsin(cx))}+\frac{4\int\frac{x^3}{a+b\arcsin(cx)}\,dx}{bc}\\
&= -\frac{x^4}{bc(a+b\arcsin(cx))}-\frac{4\text{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^5}\\
&= -\frac{x^4}{bc(a+b\arcsin(cx))}-\frac{4\text{Subst}\left(\int\left(-\frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8x}+\frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{4x}\right)\,dx,x,a+b\arcsin(cx)\right)}{b^2c^5}\\
&= -\frac{x^4}{bc(a+b\arcsin(cx))}+\frac{\text{Subst}\left(\int\frac{\sin\left(\frac{4a}{b}-\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^5}\\
&\quad-\frac{\text{Subst}\left(\int\frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^5}\\
&= -\frac{x^4}{bc(a+b\arcsin(cx))}+\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int\frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^5}\\
&\quad-\frac{\cos\left(\frac{4a}{b}\right)\text{Subst}\left(\int\frac{\sin\left(\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^5}\\
&\quad-\frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int\frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^5}\\
&\quad+\frac{\sin\left(\frac{4a}{b}\right)\text{Subst}\left(\int\frac{\cos\left(\frac{4x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^5}
\end{aligned}$$

$$= -\frac{x^4}{bc(a+b\arcsin(cx))} - \frac{\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^2c^5} + \frac{\text{CosIntegral}\left(\frac{4(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{2b^2c^5} + \frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^5} - \frac{\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(cx))}{b}\right)}{2b^2c^5}$$

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 117, normalized size of antiderivative = 0.83

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \frac{-\frac{2bc^4x^4}{a+b\arcsin(cx)} - 2\,\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{2a}{b}\right) + \text{CosIntegral}\left(4\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{4a}{b}\right) + 2}{2b^2c^5}$$

```
[In] Integrate[x^4/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] ((-2*b*c^4*x^4)/(a + b*ArcSin[c*x]) - 2*CosIntegral[2*(a/b + ArcSin[c*x])]*
Sin[(2*a)/b] + CosIntegral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] + 2*Cos[(2*a
)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - Cos[(4*a)/b]*SinIntegral[4*(a/b +
 ArcSin[c*x])])/(2*b^2*c^5)
```

Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.77

method	result
default	$-\frac{4\arcsin(cx)\,\text{Si}\left(4\arcsin(cx)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)b-4\arcsin(cx)\,\text{Ci}\left(4\arcsin(cx)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)b-8\arcsin(cx)\,\text{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)}{}$

```
[In] int(x^4/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8/c^5*(4*arcsin(c*x)*Si(4*arcsin(c*x)+4*a/b)*cos(4*a/b)*b-4*arcsin(c*x)*
Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*b-8*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*
cos(2*a/b)*b+8*arcsin(c*x)*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+4*Si(4*arcs
in(c*x)+4*a/b)*cos(4*a/b)*a-4*Ci(4*arcsin(c*x)+4*a/b)*sin(4*a/b)*a-8*Si(2*a
rcsin(c*x)+2*a/b)*cos(2*a/b)*a+8*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(4
*arcsin(c*x))*b-4*cos(2*arcsin(c*x))*b+3*b)/b^2/(a+b*arcsin(c*x))
```

Fricas [F]

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^4}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^4/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^4/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F]

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^4}{\sqrt{-(cx-1)(cx+1)}\,(a+b\,\mathrm{asin}(cx))^2}\,dx$$

```
[In] integrate(x**4/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Integral(x**4/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Maxima [F]

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^4}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^4/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -(x^4 - 4*(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integr
ate(x^3/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^
2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 876 vs. 2(137) = 274.

Time = 0.41 (sec) , antiderivative size = 876, normalized size of antiderivative = 6.21

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \text{Too large to display}$$

```
[In] integrate(x^4/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] 4*b*arcsin(c*x)*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^
3*c^5*arcsin(c*x) + a*b^2*c^5) - 4*b*arcsin(c*x)*cos(a/b)^4*sin_integral(4*
a/b + 4*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 4*a*cos(a/b)^3*cos
_integral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
 - 4*a*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^5*arcsin(c*x)
+ a*b^2*c^5) - 2*b*arcsin(c*x)*cos(a/b)*cos_integral(4*a/b + 4*arcsin(c*x))
*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*b*arcsin(c*x)*cos(a/b)*cos_
integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
+ 4*b*arcsin(c*x)*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^5*a
rcsin(c*x) + a*b^2*c^5) + 2*b*arcsin(c*x)*cos(a/b)^2*sin_integral(2*a/b + 2
*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*a*cos(a/b)*cos_integral
(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*a*co
s(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) +
a*b^2*c^5) + 4*a*cos(a/b)^2*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^5*ar
csin(c*x) + a*b^2*c^5) + 2*a*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))
/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - (c^2*x^2 - 1)^2*b/(b^3*c^5*arcsin(c*x)
 + a*b^2*c^5) - 1/2*b*arcsin(c*x)*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*
c^5*arcsin(c*x) + a*b^2*c^5) - b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(
c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*(c^2*x^2 - 1)*b/(b^3*c^5*arcsin
(c*x) + a*b^2*c^5) - 1/2*a*sin_integral(4*a/b + 4*arcsin(c*x))/(b^3*c^5*arc
sin(c*x) + a*b^2*c^5) - a*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^5*arcs
in(c*x) + a*b^2*c^5) - b/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^4}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(x^4/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
```

```
[Out] int(x^4/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.410 $\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 142

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{x^3}{bc(a+b\arcsin(cx))} + \frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^4} - \frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^4} + \frac{3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^4} - \frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^4}$$

```
[Out] -x^3/b/c/(a+b*arcsin(c*x))+3/4*Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b^2/c^4-3/4
*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b^2/c^4+3/4*Si((a+b*arcsin(c*x))/b)*s
in(a/b)/b^2/c^4-3/4*Si(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^4
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used

$= \{4807, 4731, 4491, 3384, 3380, 3383\}$

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^4} - \frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^4} + \frac{3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^4} - \frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^4} - \frac{x^3}{bc(a+b\arcsin(cx))}$$

```
[In] Int[x^3/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^3/(b*c*(a + b*ArcSin[c*x]))) + (3*Cos[a/b]*CosIntegral[(a + b*ArcSin[c*
x])/b])/(4*b^2*c^4) - (3*Cos[(3*a)/b]*CosIntegral[(3*(a + b*ArcSin[c*x]))/b
])/(4*b^2*c^4) + (3*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(4*b^2*c^4
) - (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(4*b^2*c^4)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{x^3}{bc(a+b\arcsin(cx))}+\frac{3\int \frac{x^2}{a+b\arcsin(cx)}\,dx}{bc}\\
&= -\frac{x^3}{bc(a+b\arcsin(cx))}+\frac{3\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^4}\\
&= -\frac{x^3}{bc(a+b\arcsin(cx))}+\frac{3\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)\,dx,x,a+b\arcsin(cx)\right)}{b^2c^4}\\
&= -\frac{x^3}{bc(a+b\arcsin(cx))}-\frac{3\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{4b^2c^4}\\
&\quad+\frac{3\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{4b^2c^4}\\
&= -\frac{x^3}{bc(a+b\arcsin(cx))}+\frac{\left(3\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{4b^2c^4}\\
&\quad-\frac{\left(3\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{4b^2c^4}\\
&\quad+\frac{\left(3\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{4b^2c^4}\\
&\quad-\frac{\left(3\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{4b^2c^4}
\end{aligned}$$

$$= -\frac{x^3}{bc(a+b\arcsin(cx))} + \frac{3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^4} - \frac{3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^4} + \frac{3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^4} - \frac{3\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^4}$$

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.80

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{x^3}{bc(a+b\arcsin(cx))} + \frac{3\left(\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right) - \cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right) + \sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{arc}\right.\right.}{4b^2c^4}$$

```
[In] Integrate[x^3/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^3/(b*c*(a + b*ArcSin[c*x]))) + (3*(Cos[a/b]*CosIntegral[a/b + ArcSin[c*
x]] - Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + Sin[a/b]*SinIntegra
l[a/b + ArcSin[c*x]] - Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])]))/(4
*b^2*c^4)
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.60

method	result
default	$-\frac{3\arcsin(cx)\,\text{Si}\left(3\arcsin(cx)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)b+3\arcsin(cx)\,\text{Ci}\left(3\arcsin(cx)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)b-3\arcsin(cx)\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b-3}{}$

```
[In] int(x^3/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/c^4*(3*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b+3*arcsin(c*x)*
Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b-3*arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(
a/b)*b-3*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*cos(a/b)*b+3*Si(3*arcsin(c*x)+3*a/
b)*sin(3*a/b)*a+3*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a-3*Si(arcsin(c*x)+a/b
)*sin(a/b)*a-3*Ci(arcsin(c*x)+a/b)*cos(a/b)*a+3*x*b*c-sin(3*arcsin(c*x))*b)
/(a+b*arcsin(c*x))/b^2
```

Fricas [F]

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^3/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^3/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F]

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{\sqrt{-(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate(x**3/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(x**3/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Maxima [F]

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^3/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] -(x^3 - 3*(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integr
ate(x^2/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^
2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(x^3/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
[Out] int(x^3/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.411 $\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 79

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx=-\frac{x^2}{bc(a+b\arcsin(cx))}-\frac{\operatorname{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^2c^3}+\frac{\cos\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^3}$$

```
[Out] -x^2/b/c/(a+b*arcsin(c*x))+cos(2*a/b)*Si(2*(a+b*arcsin(c*x))/b)/b^2/c^3-Ci(
2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b^2/c^3
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4807, 4731, 4491, 12, 3384, 3380, 3383}

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx=-\frac{\sin\left(\frac{2a}{b}\right)\operatorname{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^3}+\frac{\cos\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^3}-\frac{x^2}{bc(a+b\arcsin(cx))}$$

```
[In] Int[x^2/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^2/(b*c*(a + b*ArcSin[c*x]))) - (CosIntegral[(2*(a + b*ArcSin[c*x]))/b]*
Sin[(2*a)/b])/(b^2*c^3) + (Cos[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))
/b])/(b^2*c^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
```

```
+ e, 0] && LtQ[n, -1]
```

Rubi steps

$$\text{integral} = -\frac{x^2}{bc(a+b\arcsin(cx))}+\frac{2\int\frac{x}{a+b\arcsin(cx)}\,dx}{bc}$$
$$= -\frac{x^2}{bc(a+b\arcsin(cx))}-\frac{2\text{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3}$$
$$= -\frac{x^2}{bc(a+b\arcsin(cx))}-\frac{2\text{Subst}\left(\int\frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3}$$
$$= -\frac{x^2}{bc(a+b\arcsin(cx))}-\frac{\text{Subst}\left(\int\frac{\sin\left(\frac{2a}{b}-\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3}$$
$$= -\frac{x^2}{bc(a+b\arcsin(cx))}+\frac{\cos\left(\frac{2a}{b}\right)\text{Subst}\left(\int\frac{\sin\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3} - \frac{\sin\left(\frac{2a}{b}\right)\text{Subst}\left(\int\frac{\cos\left(\frac{2x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^3}$$
$$= -\frac{x^2}{bc(a+b\arcsin(cx))}-\frac{\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^2c^3}+\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^3}$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 70, normalized size of antiderivative = 0.89

$$\int\frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \frac{-\frac{bc^2x^2}{a+b\arcsin(cx)}-\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{2a}{b}\right)+\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)}{b^2c^3}$$

```
[In] Integrate[x^2/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] (-((b*c^2*x^2)/(a + b*ArcSin[c*x])) - CosIntegral[2*(a/b + ArcSin[c*x])]*Si
n[(2*a)/b] + Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(b^2*c^3)
```

Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.72

method	result
default	$\frac{2\arcsin(cx)\,\mathrm{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)b-2\arcsin(cx)\,\mathrm{Ci}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)b+2\,\mathrm{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)a-2\,\mathrm{Ci}(2\arc}{2c^3b^2(a+b\arcsin(cx))}$

```
[In] int(x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/2/c^3*(2*arcsin(c*x)*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*b-2*arcsin(c*x)*C
i(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+2*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*a-
2*Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+cos(2*arcsin(c*x))*b-b)/b^2/(a+b*arc
sin(c*x))
```

Fricas [F]

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^2/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(
c*x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F]

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{\sqrt{-(cx-1)(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

```
[In] integrate(x**2/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(x**2/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Maxima [F]

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] -(x^2 - 2*(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integr
ate(x/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x))/(b^2*
c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 346 vs. $2(79) = 158$.

Time = 0.38 (sec) , antiderivative size = 346, normalized size of antiderivative = 4.38

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{2\,b\arcsin(cx)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c^3\arcsin(cx)+ab^2c^3} + \frac{2\,b\arcsin(cx)\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c^3\arcsin(cx)+ab^2c^3} - \frac{2\,a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c^3\arcsin(cx)+ab^2c^3} + \frac{2\,a\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c^3\arcsin(cx)+ab^2c^3} - \frac{b\arcsin(cx)\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c^3\arcsin(cx)+ab^2c^3} - \frac{(c^2x^2-1)b}{b^3c^3\arcsin(cx)+ab^2c^3} - \frac{a\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c^3\arcsin(cx)+ab^2c^3} - \frac{b}{b^3c^3\arcsin(cx)+ab^2c^3}$$

```
[In] integrate(x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -2*b*arcsin(c*x)*cos(a/b)*cos_integral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3
*c^3*arcsin(c*x) + a*b^2*c^3) + 2*b*arcsin(c*x)*cos(a/b)^2*sin_integral(2*a
/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2*a*cos(a/b)*cos_in
tegral(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) +
2*a*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a
*b^2*c^3) - b*arcsin(c*x)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcs
in(c*x) + a*b^2*c^3) - (c^2*x^2 - 1)*b/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) -
a*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - b
/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(x^2/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
```

```
[Out] int(x^2/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.412 $\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 72

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{x}{bc(a+b\arcsin(cx))} + \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c^2} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c^2}$$

```
[Out] -x/b/c/(a+b*arcsin(c*x))+Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b^2/c^2+Si((a+b*a
rcsin(c*x))/b)*sin(a/b)/b^2/c^2
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4807, 4719, 3384, 3380, 3383}

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c^2} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c^2} - \frac{x}{bc(a+b\arcsin(cx))}$$

```
[In] Int[x/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x/(b*c*(a + b*ArcSin[c*x]))) + (Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/
b])/(b^2*c^2) + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2*c^2)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4807

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Dist[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[(f*x)^(m - 1)*(a + b*A
rcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d
 + e, 0] && LtQ[n, -1]
```

Rule steps

$$\begin{aligned}
\text{integral} &= -\frac{x}{bc(a+b\arcsin(cx))}+\frac{\int \frac{1}{a+b\arcsin(cx)}\,dx}{bc}\\
&= -\frac{x}{bc(a+b\arcsin(cx))}+\frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2}\\
&= -\frac{x}{bc(a+b\arcsin(cx))}+\frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2}\\
&\quad+\frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2}
\end{aligned}$$

$$=-\frac{x}{bc(a+b\arcsin(cx))}+\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c^2}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c^2}$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.82

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx$$
$$=\frac{-\frac{bcx}{a+b\arcsin(cx)}+\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^2c^2}$$

```
[In] Integrate[x/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
[Out] (-((b*c*x)/(a + b*ArcSin[c*x])) + Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] +
 Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(b^2*c^2)
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.50

method	result
default	$\frac{\arcsin(cx)\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b+\arcsin(cx)\,\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b+\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)a+\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{c^2(a+b\arcsin(cx))b^2}$

```
[In] int(x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/c^2*(arcsin(c*x)*Si(arcsin(c*x)+a/b)*sin(a/b)*b+arcsin(c*x)*Ci(arcsin(c*x
)+a/b)*cos(a/b)*b+Si(arcsin(c*x)+a/b)*sin(a/b)*a+Ci(arcsin(c*x)+a/b)*cos(a/
b)*a-x*b*c)/(a+b*arcsin(c*x))/b^2
```

Fricas [F]

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx=\int \frac{x}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(c*
x)^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [F]

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x}{\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate(x/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(x/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Maxima [F]

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] ((b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integrate(1/(b^
2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c), x) - x)/(b^2*c*arc
tan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 200 vs. $2(72) = 144$.

Time = 0.39 (sec) , antiderivative size = 200, normalized size of antiderivative = 2.78

$$\begin{aligned}\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx &= \frac{b\arcsin(cx)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2} \\ &\quad+\frac{b\arcsin(cx)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2} \\ &\quad-\frac{bcx}{b^3c^2\arcsin(cx)+ab^2c^2} \\ &\quad+\frac{a\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2} \\ &\quad+\frac{a\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2}\end{aligned}$$

```
[In] integrate(x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] b*arcsin(c*x)*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x)
 + a*b^2*c^2) + b*arcsin(c*x)*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3
*c^2*arcsin(c*x) + a*b^2*c^2) - b*c*x/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + a
*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2)
 + a*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*
c^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx=\int \frac{x}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(x/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
[Out] int(x/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.413 $\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 18

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{1}{bc(a+b\arcsin(cx))}$$

```
[Out] -1/b/c/(a+b*arcsin(c*x))
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.040$, Rules used = $\{4737\}$

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{1}{bc(a+b\arcsin(cx))}$$

```
[In] Int[1/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(1/(b*c*(a + b*ArcSin[c*x])))
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral} = -\frac{1}{bc(a+b\arcsin(cx))}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{1}{bc(a+b\arcsin(cx))}$$

```
[In] Integrate[1/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
[Out] -(1/(b*c*(a + b*ArcSin[c*x])))
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 19, normalized size of antiderivative = 1.06

method	result	size
derivativedivides	$-\frac{1}{bc(a+b\arcsin(cx))}$	19
default	$-\frac{1}{bc(a+b\arcsin(cx))}$	19

```
[In] int(1/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/b/c/(a+b*arcsin(c*x))
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{1}{b^2c\arcsin(cx)+abc}$$

```
[In] integrate(1/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] -1/(b^2*c*arcsin(c*x) + a*b*c)
```

Sympy [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.19 (sec) , antiderivative size = 53, normalized size of antiderivative = 2.94

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \begin{cases} \frac{x}{a^2} & \text{for}\ b=0 \wedge c=0 \\ \frac{\begin{cases} -\frac{i\operatorname{acosh}(cx)}{c} & \text{for}\ |c^2x^2|>1 \\ \frac{\operatorname{asin}(cx)}{c} & \text{otherwise} \end{cases}}{a^2} & \text{for}\ b=0 \\ \frac{x}{a^2} & \text{for}\ c=0 \\ -\frac{1}{abc+b^2c\operatorname{asin}(cx)} & \text{otherwise} \end{cases}$$

```
[In] integrate(1/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((x/a**2, Eq(b, 0) & Eq(c, 0)), (Piecewise((-I*acosh(c*x)/c, Abs(c
**2*x**2) > 1), (asin(c*x)/c, True))/a**2, Eq(b, 0)), (x/a**2, Eq(c, 0)), (
-1/(a*b*c + b**2*c*asin(c*x)), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{1}{(b\arcsin(cx)+a)bc}$$

```
[In] integrate(1/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/((b*arcsin(c*x) + a)*b*c)
```

Giac [A] (verification not implemented)

none

Time = 0.39 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{1}{b^2c\arcsin(cx)+abc}$$

```
[In] integrate(1/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] -1/(b^2*c*arcsin(c*x) + a*b*c)
```

Mupad [B] (verification not implemented)

Time = 0.18 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = -\frac{1}{c\,\mathrm{asin}\left(c\,x\right)\,b^2+a\,c\,b}$$

```
[In] int(1/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
[Out] -1/(b^2*c*asin(c*x) + a*b*c)
```

3.414 $\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2} dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2} dx = -\frac{1}{bcx(a+b\arcsin(cx))} - \frac{\text{Int}\left(\frac{1}{x^2(a+b\arcsin(cx))},x\right)}{bc}$$

```
[Out] -1/b/c/x/(a+b*arcsin(c*x))-Unintegrable(1/x^2/(a+b*arcsin(c*x)),x)/b/c
```

Rubi [N/A]

Not integrable

Time = 0.10 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2} dx = \int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2} dx$$

```
[In] Int[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(1/(b*c*x*(a + b*ArcSin[c*x]))) - Defer[Int][1/(x^2*(a + b*ArcSin[c*x])),
x]/(b*c)
```

Rubi steps

$$\text{integral} = -\frac{1}{bcx(a+b\arcsin(cx))} - \frac{\int \frac{1}{x^2(a+b\arcsin(cx))} dx}{bc}$$

Mathematica [N/A]

Not integrable

Time = 6.68 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/(x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.13 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{1}{x\left(a+b\arcsin\left(cx\right)\right)^{2}\sqrt{-c^{2}x^{2}+1}}dx$$

```
[In] int(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
[Out] int(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 80, normalized size of antiderivative = 2.86

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\sqrt{-c^{2}x^{2}+1}\left(b\arcsin\left(cx\right)+a\right)^{2}x}\,dx$$

```
[In] integrate(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^2*x^3 - a^2*x + (b^2*c^2*x^3 - b^2*x)*a
rcsin(c*x)^2 + 2*(a*b*c^2*x^3 - a*b*x)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 1.82 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{x\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))^2}\,dx$$

```
[In] integrate(1/x/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(1/(x*sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.88 (sec) , antiderivative size = 111, normalized size of antiderivative = 3.96

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)^2x}\,dx$$

```
[In] integrate(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] -((b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x)*integrate(
1/(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2), x) +
1)/(b^2*c*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/x/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{x\,(a+b\,\mathrm{asin}\,(c\,x))^2\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(1/(x*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
[Out] int(1/(x*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.415 $\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx=-\frac{1}{bcx^2(a+b\arcsin(cx))}-\frac{2\text{Int}\left(\frac{1}{x^3(a+b\arcsin(cx))},x\right)}{bc}$$

```
[Out] -1/b/c/x^2/(a+b*arcsin(c*x))-2*Unintegrable(1/x^3/(a+b*arcsin(c*x)),x)/b/c
```

Rubi [N/A]

Not integrable

Time = 0.10 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(1/(b*c*x^2*(a + b*ArcSin[c*x]))) - (2*Defer[Int][1/(x^3*(a + b*ArcSin[c*x
])), x])/(b*c)
```

Rubi steps

$$\text{integral}=-\frac{1}{bcx^2(a+b\arcsin(cx))}-\frac{2\int \frac{1}{x^3(a+b\arcsin(cx))}\,dx}{bc}$$

Mathematica [N/A]

Not integrable

Time = 1.28 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/(x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.06 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{1}{x^2\left(a+b\arcsin\left(cx\right)\right)^2\sqrt{-c^2x^2+1}}dx$$

```
[In] int(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
[Out] int(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 86, normalized size of antiderivative = 3.07

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\sqrt{-c^2x^2+1}\left(b\arcsin\left(cx\right)+a\right)^2x^2}\,dx$$

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="fricas
")
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^2*x^4 - a^2*x^2 + (b^2*c^2*x^4 - b^2*x^
2)*arcsin(c*x)^2 + 2*(a*b*c^2*x^4 - a*b*x^2)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 1.63 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.11

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{x^2\sqrt{-(cx-1)(cx+1)}\,(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

```
[In] integrate(1/x**2/(a+b*asin(c*x))**2/(-c**2*x**2+1)**(1/2),x)
[Out] Integral(1/(x**2*sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.87 (sec) , antiderivative size = 120, normalized size of antiderivative = 4.29

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)^2x^2}\,dx$$

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="maxima
")
[Out] -(2*(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2)*inte
grate(1/(b^2*c*x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^3),
 x) + 1)/(b^2*c*x^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c*x^2)
```

Giac [N/A]

Not integrable

Time = 0.79 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)^2x^2}\,dx$$

```
[In] integrate(1/x^2/(a+b*arcsin(c*x))^2/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)^2*x^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{x^2\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,\sqrt{1-c^2\,x^2}}\,dx$$

```
[In] int(1/(x^2*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)),x)
[Out] int(1/(x^2*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(1/2)), x)
```

3.416 $\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2} dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2} dx = \operatorname{Int}\left(\frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}, x\right)$$

```
[Out] Unintegrable(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2} dx = \int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2} dx$$

```
[In] Int[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2} dx$$

Mathematica [N/A]

Not integrable

Time = 1.41 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x^m/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.35 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^m}{(-c^2x^2+1)^{\frac{3}{2}}(a+b\arcsin(cx))^2}dx$$

```
[In] int(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 106, normalized size of antiderivative = 3.79

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^m/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4
 - 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^
2 + a*b)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 64.36 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

```
[In] integrate(x**m/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(x**m/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 1.37 (sec) , antiderivative size = 218, normalized size of antiderivative = 7.79

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -((a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1)))*integrate(((c^2*m - 2*c^2)*x^2 - m)*x^m/(a*b*c^5*x^5 - 2*a*
b*c^3*x^3 + a*b*c*x + (b^2*c^5*x^5 - 2*b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))), x) - x^m)/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x
^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [N/A]

Not integrable

Time = 1.13 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(x^m/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,{\left(1-c^2\,x^2\right)}^{3/2}}\,dx$$

```
[In] int(x^m/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)),x)
[Out] int(x^m/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)), x)
```

3.417 $\int \frac{x^3}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^3}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{x^3}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^3}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[x^3/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][x^3/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{x^3}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 52.05 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^3}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[x^3/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x^3/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.22 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^3}{(-c^2x^2+1)^{\frac{3}{2}}(a+b\arcsin(cx))^2}dx$$

```
[In] int(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 106, normalized size of antiderivative = 3.79

$$\int \frac{x^3}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^3/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4
 - 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^
2 + a*b)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 3.52 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{x^3}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{\left(-(cx-1)(cx+1)\right)^{\frac{3}{2}}(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

```
[In] integrate(x**3/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(x**3/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 1.09 (sec) , antiderivative size = 205, normalized size of antiderivative = 7.32

$$\int \frac{x^3}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (x^3 - (a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1)))*integrate((c^2*x^4 - 3*x^2)/(a*b*c^5*x^4 - 2*a*b*c^3*x
^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*x^2 + b^2*c)*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1))), x))/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^3}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{(a+b\,\mathrm{asin}\,(c\,x))^2\,(1-c^2\,x^2)^{3/2}}\,dx$$

```
[In] int(x^3/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)),x)
[Out] int(x^3/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)), x)
```

3.418 $\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = -\frac{x^2}{bc(1-c^2x^2)(a+b\arcsin(cx))}+\frac{2\text{Int}\left(\frac{x}{(1-c^2x^2)^2(a+b\arcsin(cx))},x\right)}{bc}$$

```
[Out] -x^2/b/c/(-c^2*x^2+1)/(a+b*arcsin(c*x))+2*Unintegrable(x/(-c^2*x^2+1)^2/(a+
b*arcsin(c*x)),x)/b/c
```

Rubi [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(x^2/(b*c*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))) + (2*Defer[Int][x/((1 - c^2*
x^2)^2*(a + b*ArcSin[c*x])), x])/(b*c)
```

Rubi steps

$$\text{integral} = -\frac{x^2}{bc(1-c^2x^2)(a+b\arcsin(cx))}+\frac{2\int \frac{x}{(1-c^2x^2)^2(a+b\arcsin(cx))}\,dx}{bc}$$

Mathematica [N/A]

Not integrable

Time = 7.28 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x^2/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.19 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^2}{(-c^2x^2+1)^{\frac{3}{2}}(a+b\arcsin(cx))^2}dx$$

```
[In] int(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 106, normalized size of antiderivative = 3.79

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x^2/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4
 - 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^
2 + a*b)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 3.42 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

```
[In] integrate(x**2/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(x**2/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.85 (sec) , antiderivative size = 193, normalized size of antiderivative = 6.89

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (x^2 + 2*(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)))*integrate(x/(a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (
b^2*c^5*x^4 - 2*b^2*c^3*x^2 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))), x))/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c
*x + 1)*sqrt(-c*x + 1)))
```

Giac [N/A]

Not integrable

Time = 1.77 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(x^2/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^2}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx=\int \frac{x^2}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,{\left(1-c^2\,x^2\right)}^{3/2}}\,dx$$

```
[In] int(x^2/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)),x)
[Out] int(x^2/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)), x)
```

3.419 $\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 26

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx = \operatorname{Int}\left(\frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 47.96 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.08

$$\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.09 (sec) , antiderivative size = 24, normalized size of antiderivative = 0.92

$$\int \frac{x}{(-c^2x^2+1)^{\frac{3}{2}}(a+b\arcsin(cx))^2}dx$$

```
[In] int(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 104, normalized size of antiderivative = 4.00

$$\int \frac{x}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x}{(-c^2x^2+1)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)*x/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4 -
 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^2
+ a*b)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 3.59 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.04

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{x}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

```
[In] integrate(x/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.92 (sec) , antiderivative size = 198, normalized size of antiderivative = 7.62

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{x}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] ((a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sq
rt(-c*x + 1)))*integrate((c^2*x^2 + 1)/(a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c
 + (b^2*c^5*x^4 - 2*b^2*c^3*x^2 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))), x) + x)/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00

$$\int \frac{x}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx=\int \frac{x}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(1-c^2\,x^2\right)}^{3/2}}\,dx$$

```
[In] int(x/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)),x)
[Out] int(x/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)), x)
```

3.420 $\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = -\frac{1}{bc(1-c^2x^2)(a+b\arcsin(cx))}+\frac{2c\text{Int}\left(\frac{x}{(1-c^2x^2)^2(a+b\arcsin(cx))},x\right)}{b}$$

```
[Out] -1/b/c/(-c^2*x^2+1)/(a+b*arcsin(c*x))+2*c*Unintegrable(x/(-c^2*x^2+1)^2/(a+
b*arcsin(c*x)),x)/b
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(1/(b*c*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))) + (2*c*Defer[Int][x/((1 - c^2*
x^2)^2*(a + b*ArcSin[c*x])), x])/b
```

Rubi steps

$$\text{integral} = -\frac{1}{bc(1-c^2x^2)(a+b\arcsin(cx))}+\frac{(2c)\int \frac{x}{(1-c^2x^2)^2(a+b\arcsin(cx))}\,dx}{b}$$

Mathematica [N/A]

Not integrable

Time = 2.28 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.06 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 103, normalized size of antiderivative = 4.12

$$\int \frac{1}{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(a^2*c^4*x^4 - 2*a^2*c^2*x^2 + (b^2*c^4*x^4 - 2
*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + a^2 + 2*(a*b*c^4*x^4 - 2*a*b*c^2*x^2 +
a*b)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 4.41 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{(1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2} dx = \int \frac{1}{(-(cx-1)(cx+1))^{\frac{3}{2}} (a+b\,\mathrm{asin}\,(cx))^2} dx$$

```
[In] integrate(1/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(1/((-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.85 (sec) , antiderivative size = 192, normalized size of antiderivative = 7.68

$$\int \frac{1}{(1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2} dx = \int \frac{1}{(-c^2x^2+1)^{\frac{3}{2}} (b\arcsin(cx)+a)^2} dx$$

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] (2*(a*b*c^4*x^2 - a*b*c^2 + (b^2*c^4*x^2 - b^2*c^2)*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1)))*integrate(x/(a*b*c^4*x^4 - 2*a*b*c^2*x^2 + a*b + (b^2*
c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))),
 x) + 1)/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)))
```

Giac [N/A]

Not integrable

Time = 1.01 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2} dx = \int \frac{1}{(-c^2x^2+1)^{\frac{3}{2}} (b\arcsin(cx)+a)^2} dx$$

```
[In] integrate(1/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,\left(1-c^2\,x^2\right)^{3/2}}\,dx$$

```
[In] int(1/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)),x)
[Out] int(1/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)), x)
```

3.421 $\int \frac{1}{x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}\,dx=\operatorname{Int}\left(\frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral}=\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 40.72 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/(x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.08 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{1}{x\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 108, normalized size of antiderivative = 3.86

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2x}\,dx$$

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*x^2 + 1)/(a^2*c^4*x^5 - 2*a^2*c^2*x^3 + a^2*x + (b^2*c^4
*x^5 - 2*b^2*c^2*x^3 + b^2*x)*arcsin(c*x)^2 + 2*(a*b*c^4*x^5 - 2*a*b*c^2*x^
3 + a*b*x)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 6.62 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{x\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

```
[In] integrate(1/x/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(1/(x*(-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 1.01 (sec) , antiderivative size = 209, normalized size of antiderivative = 7.46

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2x}\,dx$$

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] ((a*b*c^3*x^3 - a*b*c*x + (b^2*c^3*x^3 - b^2*c*x)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1)))*integrate((3*c^2*x^2 - 1)/(a*b*c^5*x^6 - 2*a*b*c^3*x^4 +
 a*b*c*x^2 + (b^2*c^5*x^6 - 2*b^2*c^3*x^4 + b^2*c*x^2)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1))), x) + 1)/(a*b*c^3*x^3 - a*b*c*x + (b^2*c^3*x^3 - b^
2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(1/x/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{x\,{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2\,{\left(1-c^2\,x^2\right)}^{3/2}} \,d x$$

```
[In] int(1/(x*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)),x)
[Out] int(1/(x*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)), x)
```

3.422 $\int \frac{1}{x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2}\,dx = \mathrm{Int}\left(\frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 27.96 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Integrate[1/(x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.59 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{1}{x^2 \left(-c^2x^2+1\right)^{\frac{3}{2}} \left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 114, normalized size of antiderivative = 4.07

$$\int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(-c^2x^2+1\right)^{\frac{3}{2}} \left(b\arcsin\left(cx\right)+a\right)^2 x^2}\,dx$$

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*x^2 + 1)/(a^2*c^4*x^6 - 2*a^2*c^2*x^4 + a^2*x^2 + (b^2*c
^4*x^6 - 2*b^2*c^2*x^4 + b^2*x^2)*arcsin(c*x)^2 + 2*(a*b*c^4*x^6 - 2*a*b*c^
2*x^4 + a*b*x^2)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 5.65 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.11

$$\int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2} \, dx = \int \frac{1}{x^2 \left(-(cx-1)(cx+1)\right)^{\frac{3}{2}} (a+b\operatorname{asin}(cx))^2} \, dx$$

```
[In] integrate(1/x**2/(-c**2*x**2+1)**(3/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(1/(x**2*(-(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.93 (sec) , antiderivative size = 218, normalized size of antiderivative = 7.79

$$\int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2} \, dx = \int \frac{1}{(-c^2x^2+1)^{\frac{3}{2}} (b\arcsin(cx)+a)^2 x^2} \, dx$$

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
[Out] ((a*b*c^3*x^4 - a*b*c*x^2 + (b^2*c^3*x^4 - b^2*c*x^2)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)))*integrate(2*(2*c^2*x^2 - 1)/(a*b*c^5*x^7 - 2*a*b*c^3
*x^5 + a*b*c*x^3 + (b^2*c^5*x^7 - 2*b^2*c^3*x^5 + b^2*c*x^3)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))), x) + 1)/(a*b*c^3*x^4 - a*b*c*x^2 + (b^2*c^3*
x^4 - b^2*c*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [N/A]

Not integrable

Time = 17.56 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2 (1-c^2x^2)^{3/2} (a+b\arcsin(cx))^2} \, dx = \int \frac{1}{(-c^2x^2+1)^{\frac{3}{2}} (b\arcsin(cx)+a)^2 x^2} \, dx$$

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((-c^2*x^2 + 1)^(3/2)*(b*arcsin(c*x) + a)^2*x^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2 \left(1-c^2x^2\right)^{3/2} (a+b\arcsin(cx))^2} \, dx = \int \frac{1}{x^2 \left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2 \left(1-c^2\,x^2\right)^{3/2}} \, dx$$

```
[In] int(1/(x^2*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)),x)
[Out] int(1/(x^2*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(3/2)), x)
```

3.423 $\int \frac{x^m}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \operatorname{Int}\left(\frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 2.06 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x^m/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.40 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^m}{(-c^2x^2+1)^{\frac{5}{2}}\,(a+b\arcsin(cx))^2}dx$$

```
[In] int(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 144, normalized size of antiderivative = 5.14

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m}{(-c^2x^2+1)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^m/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x
^2 + (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^
2 + 2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 78.58 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{x^m}{(1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2} \, dx = \int \frac{x^m}{(-(cx-1)(cx+1))^{\frac{5}{2}} (a+b\operatorname{asin}(cx))^2} \, dx$$

```
[In] integrate(x**m/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(x**m/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 1.42 (sec) , antiderivative size = 278, normalized size of antiderivative = 9.93

$$\int \frac{x^m}{(1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2} \, dx = \int \frac{x^m}{(-c^2x^2+1)^{\frac{5}{2}} (b\arcsin(cx)+a)^2} \, dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] ((a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*x^2 + b^2*
c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate(((c^2*m - 4*c^2)*x
^2 - m)*x^m/(a*b*c^7*x^7 - 3*a*b*c^5*x^5 + 3*a*b*c^3*x^3 - a*b*c*x + (b^2*c
^7*x^7 - 3*b^2*c^5*x^5 + 3*b^2*c^3*x^3 - b^2*c*x)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))), x) - x^m)/(a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c
^5*x^4 - 2*b^2*c^3*x^2 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [N/A]

Not integrable

Time = 2.31 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{(1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2} \, dx = \int \frac{x^m}{(-c^2x^2+1)^{\frac{5}{2}} (b\arcsin(cx)+a)^2} \, dx$$

```
[In] integrate(x^m/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(x^m/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^m}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx=\int \frac{x^m}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,\left(1-c^2\,x^2\right)^{5/2}}\,dx$$

```
[In] int(x^m/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)),x)
[Out] int(x^m/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)), x)
```

3.424 $\int \frac{x^3}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^3}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{x^3}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^3}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[x^3/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][x^3/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{x^3}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 78.70 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^3}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[x^3/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x^3/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.71 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^3}{(-c^2x^2+1)^{\frac{5}{2}}(a+b\arcsin(cx))^2}dx$$

```
[In] int(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 144, normalized size of antiderivative = 5.14

$$\int \frac{x^3}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{(-c^2x^2+1)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^3/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x
^2 + (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^
2 + 2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 3.99 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{x^3}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

```
[In] integrate(x**3/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(x**3/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 1.22 (sec) , antiderivative size = 266, normalized size of antiderivative = 9.50

$$\int \frac{x^3}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{x^3}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -(x^3 + (a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*x^2
 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((c^2*x^4 +
3*x^2)/(a*b*c^7*x^6 - 3*a*b*c^5*x^4 + 3*a*b*c^3*x^2 - a*b*c + (b^2*c^7*x^6
- 3*b^2*c^5*x^4 + 3*b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))), x))/(a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*
c^3*x^2 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^3}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx=\int \frac{x^3}{(a+b\,\mathrm{asin}\,(c\,x))^2\,(1-c^2\,x^2)^{5/2}}\,dx$$

```
[In] int(x^3/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)),x)
[Out] int(x^3/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)), x)
```

3.425 $\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx = \operatorname{Int}\left(\frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 12.50 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x^2/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.63 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{x^2}{(-c^2x^2+1)^{\frac{5}{2}}(a+b\arcsin(cx))^2}dx$$

```
[In] int(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 144, normalized size of antiderivative = 5.14

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{(-c^2x^2+1)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x^2/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x
^2 + (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^
2 + 2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 3.83 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

```
[In] integrate(x**2/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(x**2/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 1.04 (sec) , antiderivative size = 263, normalized size of antiderivative = 9.39

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -(x^2 + (a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*x^2
 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate(2*(c^2*x^3
+ x)/(a*b*c^7*x^6 - 3*a*b*c^5*x^4 + 3*a*b*c^3*x^2 - a*b*c + (b^2*c^7*x^6 -
3*b^2*c^5*x^4 + 3*b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1))), x))/(a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^
3*x^2 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [N/A]

Not integrable

Time = 5.04 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{x^2}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(x^2/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{x^2}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx=\int \frac{x^2}{(a+b\,\mathrm{asin}\left(c\,x\right))^2\,(1-c^2\,x^2)^{5/2}}\,dx$$

```
[In] int(x^2/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)),x)
[Out] int(x^2/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)), x)
```

3.426 $\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 26

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \mathrm{Int}\left(\frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 78.69 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.08

$$\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx=\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[x/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.66 (sec) , antiderivative size = 24, normalized size of antiderivative = 0.92

$$\int \frac{x}{(-c^2x^2+1)^{\frac{5}{2}}(a+b\arcsin(cx))^2}dx$$

```
[In] int(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 142, normalized size of antiderivative = 5.46

$$\int \frac{x}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx=\int \frac{x}{(-c^2x^2+1)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)*x/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x^2
 + (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^2
+ 2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 3.66 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.04

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{x}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

```
[In] integrate(x/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(x/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 1.17 (sec) , antiderivative size = 261, normalized size of antiderivative = 10.04

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{x}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -((a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*x^2 + b^2
*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((3*c^2*x^2 + 1)/(
a*b*c^7*x^6 - 3*a*b*c^5*x^4 + 3*a*b*c^3*x^2 - a*b*c + (b^2*c^7*x^6 - 3*b^2*
c^5*x^4 + 3*b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
), x) + x)/(a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*
x^2 + b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.14 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.00

$$\int \frac{x}{(1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2} \, dx = \int \frac{x}{(a+b\,\mathrm{asin}\left(c\,x\right))^2 \left(1-c^2\,x^2\right)^{5/2}} \, dx$$

```
[In] int(x/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)),x)
[Out] int(x/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)), x)
```

3.427 $\int \frac{1}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx = -\frac{1}{bc(1-c^2x^2)^2(a+b\arcsin(cx))}+\frac{4c\text{Int}\left(\frac{x}{(1-c^2x^2)^3(a+b\arcsin(cx))},x\right)}{b}$$

```
[Out] -1/b/c/(-c^2*x^2+1)^2/(a+b*arcsin(c*x))+4*c*Unintegrable(x/(-c^2*x^2+1)^3/(
a+b*arcsin(c*x)),x)/b
```

Rubi [N/A]

Not integrable

Time = 0.08 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] -(1/(b*c*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))) + (4*c*Defer[Int][x/((1 - c^
2*x^2)^3*(a + b*ArcSin[c*x])), x])/b
```

Rubi steps

$$\text{integral} = -\frac{1}{bc(1-c^2x^2)^2(a+b\arcsin(cx))}+\frac{(4c)\int \frac{x}{(1-c^2x^2)^3(a+b\arcsin(cx))}\,dx}{b}$$

Mathematica [N/A]

Not integrable

Time = 4.77 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.34 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{(-c^2x^2+1)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 141, normalized size of antiderivative = 5.64

$$\int \frac{1}{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(-c^2x^2+1)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^6*x^6 - 3*a^2*c^4*x^4 + 3*a^2*c^2*x^2 +
 (b^2*c^6*x^6 - 3*b^2*c^4*x^4 + 3*b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^2 +
2*(a*b*c^6*x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 3.92 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

```
[In] integrate(1/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(1/((-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.91 (sec) , antiderivative size = 255, normalized size of antiderivative = 10.20

$$\int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -(4*(a*b*c^6*x^4 - 2*a*b*c^4*x^2 + a*b*c^2 + (b^2*c^6*x^4 - 2*b^2*c^4*x^2 +
 b^2*c^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate(x/(a*b*c^6*
x^6 - 3*a*b*c^4*x^4 + 3*a*b*c^2*x^2 - a*b + (b^2*c^6*x^6 - 3*b^2*c^4*x^4 +
3*b^2*c^2*x^2 - b^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x) + 1)/(
a*b*c^5*x^4 - 2*a*b*c^3*x^2 + a*b*c + (b^2*c^5*x^4 - 2*b^2*c^3*x^2 + b^2*c)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [N/A]

Not integrable

Time = 2.19 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(1/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,{\left(1-c^2\,x^2\right)}^{5/2}}\,dx$$

```
[In] int(1/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)),x)
[Out] int(1/((a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)), x)
```

3.428 $\int \frac{1}{x(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)^2}\,dx=\text{Int}\left(\frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)^2},x\right)$$

```
[Out] Unintegrable(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)^2}\,dx=\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)^2}\,dx$$

```
[In] Int[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral}=\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 60.51 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)^2}\,dx=\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)^2}\,dx$$

```
[In] Integrate[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/(x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 2.61 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{1}{x\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 144, normalized size of antiderivative = 5.14

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}\left(a+b\arcsin(cx)\right)^2}\,dx=\int \frac{1}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2x}\,dx$$

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^6*x^7 - 3*a^2*c^4*x^5 + 3*a^2*c^2*x^3 -
 a^2*x + (b^2*c^6*x^7 - 3*b^2*c^4*x^5 + 3*b^2*c^2*x^3 - b^2*x)*arcsin(c*x)^
2 + 2*(a*b*c^6*x^7 - 3*a*b*c^4*x^5 + 3*a*b*c^2*x^3 - a*b*x)*arcsin(c*x)), x
)
```

Sympy [N/A]

Not integrable

Time = 8.17 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.04

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{x\left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

```
[In] integrate(1/x/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(1/(x*(-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 1.18 (sec) , antiderivative size = 271, normalized size of antiderivative = 9.68

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(-c^2x^2+1\right)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2x}\,dx$$

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -((a*b*c^5*x^5 - 2*a*b*c^3*x^3 + a*b*c*x + (b^2*c^5*x^5 - 2*b^2*c^3*x^3 + b
^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((5*c^2*x^2 -
1)/(a*b*c^7*x^8 - 3*a*b*c^5*x^6 + 3*a*b*c^3*x^4 - a*b*c*x^2 + (b^2*c^7*x^8
- 3*b^2*c^5*x^6 + 3*b^2*c^3*x^4 - b^2*c*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1))), x) + 1)/(a*b*c^5*x^5 - 2*a*b*c^3*x^3 + a*b*c*x + (b^2*c^5*x^
5 - 2*b^2*c^3*x^3 + b^2*c*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [F(-2)]

Exception generated.

$$\int \frac{1}{x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/x/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x (1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2} \, dx = \int \frac{1}{x \left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2 \left(1-c^2\,x^2\right)^{5/2}} \,dx$$

```
[In] int(1/(x*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)),x)
[Out] int(1/(x*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)), x)
```

3.429 $\int \frac{1}{x^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 28

$$\int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 23.64 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.07

$$\int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/(x^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.87 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.93

$$\int \frac{1}{x^2 (-c^2x^2+1)^{\frac{5}{2}} (a+b\arcsin(cx))^2}dx$$

```
[In] int(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 150, normalized size of antiderivative = 5.36

$$\int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(-c^2x^2+1)^{\frac{5}{2}} (b\arcsin(cx)+a)^2 x^2}\,dx$$

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
[Out] integral(-sqrt(-c^2*x^2 + 1)/(a^2*c^6*x^8 - 3*a^2*c^4*x^6 + 3*a^2*c^2*x^4 -
 a^2*x^2 + (b^2*c^6*x^8 - 3*b^2*c^4*x^6 + 3*b^2*c^2*x^4 - b^2*x^2)*arcsin(c
*x)^2 + 2*(a*b*c^6*x^8 - 3*a*b*c^4*x^6 + 3*a*b*c^2*x^4 - a*b*x^2)*arcsin(c*
x)), x)
```

Sympy [N/A]

Not integrable

Time = 6.13 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.11

$$\int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{x^2 \left(-\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}} \left(a+b\,\mathrm{asin}\left(cx\right)\right)^2}\,dx$$

```
[In] integrate(1/x**2/(-c**2*x**2+1)**(5/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(1/(x**2*(-(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2), x)
```

Maxima [N/A]

Not integrable

Time = 1.09 (sec) , antiderivative size = 280, normalized size of antiderivative = 10.00

$$\int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(-c^2x^2+1)^{\frac{5}{2}} (b\arcsin\left(cx\right)+a)^2 x^2}\,dx$$

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
[Out] -((a*b*c^5*x^6 - 2*a*b*c^3*x^4 + a*b*c*x^2 + (b^2*c^5*x^6 - 2*b^2*c^3*x^4 +
 b^2*c*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate(2*(3*c^2*
x^2 - 1)/(a*b*c^7*x^9 - 3*a*b*c^5*x^7 + 3*a*b*c^3*x^5 - a*b*c*x^3 + (b^2*c^
7*x^9 - 3*b^2*c^5*x^7 + 3*b^2*c^3*x^5 - b^2*c*x^3)*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1))), x) + 1)/(a*b*c^5*x^6 - 2*a*b*c^3*x^4 + a*b*c*x^2 + (b^
2*c^5*x^6 - 2*b^2*c^3*x^4 + b^2*c*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)))
```

Giac [N/A]

Not integrable

Time = 48.38 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(-c^2x^2+1)^{\frac{5}{2}} (b\arcsin\left(cx\right)+a)^2 x^2}\,dx$$

```
[In] integrate(1/x^2/(-c^2*x^2+1)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((-c^2*x^2 + 1)^(5/2)*(b*arcsin(c*x) + a)^2*x^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00

$$\int \frac{1}{x^2 (1-c^2x^2)^{5/2} (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{x^2\,(a+b\,\mathrm{asin}\,(c\,x))^2\,(1-c^2\,x^2)^{5/2}}\,dx$$

```
[In] int(1/(x^2*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)),x)
[Out] int(1/(x^2*(a + b*asin(c*x))^2*(1 - c^2*x^2)^(5/2)), x)
```

3.430 $\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 13

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)^3}\,dx = -\frac{1}{2a\arcsin(ax)^2}$$

```
[Out] -1/2/a/arcsin(a*x)^2
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4737}

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)^3}\,dx = -\frac{1}{2a\arcsin(ax)^2}$$

```
[In] Int[1/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3),x]
```

```
[Out] -1/2*1/(a*ArcSin[a*x]^2)
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral} = -\frac{1}{2a\arcsin(ax)^2}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)^3}\,dx = -\frac{1}{2a\arcsin(ax)^2}$$

```
[In] Integrate[1/(Sqrt[1 - a^2*x^2]*ArcSin[a*x]^3),x]
[Out] -1/2*1/(a*ArcSin[a*x]^2)
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.92

method	result	size
derivativedivides	$-\frac{1}{2a\arcsin(ax)^2}$	12
default	$-\frac{1}{2a\arcsin(ax)^2}$	12

```
[In] int(1/arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/2/a/arcsin(a*x)^2
```

Fricas [A] (verification not implemented)

none

Time = 0.24 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)^3}\,dx = -\frac{1}{2\,a\arcsin\left(ax\right)^2}$$

```
[In] integrate(1/arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] -1/2/(a*arcsin(a*x)^2)
```

Sympy [A] (verification not implemented)

Time = 0.33 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.92

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)^3}\,dx = -\frac{1}{2a\,\mathrm{asin}^2\,(ax)}$$

```
[In] integrate(1/asin(a*x)**3/(-a**2*x**2+1)**(1/2),x)
[Out] -1/(2*a*asin(a*x)**2)
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)^3}\,dx = -\frac{1}{2\,a\arcsin\,(ax)^2}$$

```
[In] integrate(1/arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] -1/2/(a*arcsin(a*x)^2)
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)^3}\,dx = -\frac{1}{2\,a\arcsin\,(ax)^2}$$

```
[In] integrate(1/arcsin(a*x)^3/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] -1/2/(a*arcsin(a*x)^2)
```

Mupad [B] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.85

$$\int \frac{1}{\sqrt{1-a^2x^2}\arcsin(ax)^3}\,dx = -\frac{1}{2\,a\,\mathrm{asin}\,(a\,x)^2}$$

```
[In] int(1/(asin(a*x)^3*(1 - a^2*x^2)^(1/2)),x)
[Out] -1/(2*a*asin(a*x)^2)
```

3.431 $\int \frac{x^3(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 251

$$\int \frac{x^3(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = -\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{d\sqrt{3\pi}\cos\left(\frac{6a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4} + \frac{3d\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8b^{3/2}c^4} + \frac{3d\sqrt{\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{8b^{3/2}c^4} - \frac{d\sqrt{3\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{6a}{b}\right)}{8b^{3/2}c^4}$$

```
[Out] 3/8*d*cos(2*a/b)*FresnelC(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1
/2)/b^(3/2)/c^4+3/8*d*FresnelS(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*
sin(2*a/b)*Pi^(1/2)/b^(3/2)/c^4-1/8*d*cos(6*a/b)*FresnelC(2*3^(1/2)/Pi^(1/2
)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*3^(1/2)*Pi^(1/2)/b^(3/2)/c^4-1/8*d*Fresn
elS(2*3^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(6*a/b)*3^(1/2)*
Pi^(1/2)/b^(3/2)/c^4-2*d*x^3*(-c^2*x^2+1)^(3/2)/b/c/(a+b*arcsin(c*x))^(1/2)
```

Rubi [A] (verified)

Time = 0.76 (sec) , antiderivative size = 251, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {4799, 4809, 4491, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{x^3(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = -\frac{\sqrt{3\pi}d\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4} + \frac{3\sqrt{\pi}d\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8b^{3/2}c^4} + \frac{3\sqrt{\pi}d\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8b^{3/2}c^4} - \frac{\sqrt{3\pi}d\sin\left(\frac{6a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4} - \frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}}$$

```
[In] Int[(x^3*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d*x^3*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (d*Sqrt[3*Pi
]*Cos[(6*a)/b]*FresnelC[(2*Sqrt[3/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(8
*b^(3/2)*c^4) + (3*d*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*
x]])/(Sqrt[b]*Sqrt[Pi])])/(8*b^(3/2)*c^4) + (3*d*Sqrt[Pi]*FresnelS[(2*Sqrt[
a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(8*b^(3/2)*c^4) - (d*
Sqrt[3*Pi]*FresnelS[(2*Sqrt[3/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(6*
a)/b])/(8*b^(3/2)*c^4)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(6d)\int \frac{x^2\sqrt{1-c^2x^2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{bc} - \frac{(12cd)\int \frac{x^4\sqrt{1-c^2x^2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{b}$$

$$= -\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(6d)\text{Subst}\left(\int \frac{\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^4} - \frac{(12d)\text{Subst}\left(\int \frac{\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^4}$$

$$=-\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}}+\frac{(6d)\text{Subst}\left(\int\left(\frac{1}{8\sqrt{x}}-\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8\sqrt{x}}\right)dx,x,a+b\arcsin(cx)\right)}{b^2c^4}-\frac{(12d)\text{Subst}\left(\int\left(\frac{1}{16\sqrt{x}}+\frac{\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)}{32\sqrt{x}}-\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{16\sqrt{x}}-\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{32\sqrt{x}}\right)dx,x,a+b\arcsin(cx)\right)}{b^2c^4}$$

$$=-\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}}-\frac{(3d)\text{Subst}\left(\int\frac{\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{8b^2c^4}+\frac{(3d)\text{Subst}\left(\int\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{8b^2c^4}$$

$$=-\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}}+\frac{\left(3d\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{8b^2c^4}-\frac{\left(3d\cos\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{6x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{8b^2c^4}+\frac{\left(3d\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{8b^2c^4}-\frac{\left(3d\sin\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{6x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{8b^2c^4}$$

$$=-\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}}+\frac{\left(3d\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c^4}-\frac{\left(3d\cos\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{6x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c^4}+\frac{\left(3d\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c^4}-\frac{\left(3d\sin\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{6x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c^4}$$

$$= -\frac{2dx^3(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{d\sqrt{3\pi}\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4} + \frac{3d\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8b^{3/2}c^4} + \frac{3d\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{8b^{3/2}c^4} - \frac{d\sqrt{3\pi}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{6a}{b}\right)}{8b^{3/2}c^4}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.52 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.14

$$\int \frac{x^3(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = -\frac{ide^{-\frac{6ia}{b}}\left(3\sqrt{2}e^{\frac{4ia}{b}}\sqrt{-\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{1}{2},-\frac{2i(a+b\arcsin(cx))}{b}\right) - 3\sqrt{2}e^{\frac{8ia}{b}}\sqrt{\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{1}{2},\frac{2i(a+b\arcsin(cx))}{b}\right) -\right.}{}$$

```
[In] Integrate[(x^3*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] ((-1/32*I)*d*(3*Sqrt[2]*E^(((4*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*
Gamma[1/2, ((-2*I)*(a + b*ArcSin[c*x]))/b] - 3*Sqrt[2]*E^(((8*I)*a)/b)*Sqrt
[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c*x]))/b] - Sqr
t[6]*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-6*I)*(a + b*ArcSin[c*
x]))/b] + Sqrt[6]*E^(((12*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/
2, ((6*I)*(a + b*ArcSin[c*x]))/b] - (6*I)*E^(((6*I)*a)/b)*Sin[2*ArcSin[c*x]
] + (2*I)*E^(((6*I)*a)/b)*Sin[6*ArcSin[c*x]]))/(b*c^4*E^(((6*I)*a)/b)*Sqrt[
a + b*ArcSin[c*x]])
```

Maple [A] (verified)

Time = 0.29 (sec) , antiderivative size = 304, normalized size of antiderivative = 1.21

method	result
default	$\frac{d\left(-\sqrt{a+b\arcsin(cx)}\sqrt{-\frac{6}{b}}\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{6\sqrt{2}\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\sqrt{-\frac{6}{b}}\,b}\right)\sqrt{\pi}\sqrt{2}+\sqrt{a+b\arcsin(cx)}\sqrt{-\frac{6}{b}}\sin\left(\frac{6a}{b}\right)\text{FresnelS}\left(\frac{6\sqrt{2}\sqrt{a+b\right.\right.}{}$

```
[In] int(x^3*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/16/c^4*d/b*(-(a+b*arcsin(c*x))^(1/2)*(-6/b)^(1/2)*cos(6*a/b)*FresnelC(6*2
^(1/2)/Pi^(1/2)/(-6/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*2^(1/2)+(a
+b*arcsin(c*x))^(1/2)*(-6/b)^(1/2)*sin(6*a/b)*FresnelS(6*2^(1/2)/Pi^(1/2)/(
-6/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*2^(1/2)+6*(-1/b)^(1/2)*cos(
2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*
(a+b*arcsin(c*x))^(1/2)*Pi^(1/2)-6*(-1/b)^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/
2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)
*Pi^(1/2)+3*sin(-2*(a+b*arcsin(c*x))/b+2*a/b)-sin(-6*(a+b*arcsin(c*x))/b+6*
a/b))/(a+b*arcsin(c*x))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{x^3(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{x^3(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = -d\left(\int\left(-\frac{x^3}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx + \int\frac{c^2x^5}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx\right)$$

```
[In] integrate(x**3*(-c**2*d*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] -d*(Integral(-x**3/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin(
c*x)), x) + Integral(c**2*x**5/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin
(c*x))*asin(c*x)), x))
```

Maxima [F]

$$\int \frac{x^3(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \int -\frac{(c^2dx^2-d)x^3}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
[Out] -integrate((c^2*d*x^2 - d)*x^3/(b*arcsin(c*x) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{x^3(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \int -\frac{(c^2dx^2-d)x^3}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)*x^3/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{x^3\,(d-c^2\,d\,x^2)}{(a+b\,\mathrm{asin}\,(c\,x))^{3/2}}\,dx$$

```
[In] int((x^3*(d - c^2*d*x^2))/(a + b*asin(c*x))^(3/2),x)
[Out] int((x^3*(d - c^2*d*x^2))/(a + b*asin(c*x))^(3/2), x)
```

3.432 $\int \frac{x^2(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 591

$$\int \frac{x^2(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{5d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c^3} + \frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3} - \frac{5d\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c^3} + \frac{d\sqrt{\frac{2\pi}{3}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3} + \frac{d\sqrt{\frac{5\pi}{2}}\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c^3} + \frac{5d\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2b^{3/2}c^3} - \frac{d\sqrt{2\pi}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}c^3} + \frac{5d\sqrt{\frac{\pi}{6}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{4b^{3/2}c^3} - \frac{d\sqrt{\frac{2\pi}{3}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{b^{3/2}c^3} - \frac{d\sqrt{\frac{5\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{4b^{3/2}c^3}$$

```
[Out] 1/8*d*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))
*6^(1/2)*Pi^(1/2)/b^(3/2)/c^3-1/8*d*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c
*x))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(3/2)/c^3-1/4*d*cos(a/b)*
FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)
/b^(3/2)/c^3+1/4*d*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2
))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c^3+1/8*d*cos(5*a/b)*FresnelS(10^(1/2)
```

```
/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*10^(1/2)*Pi^(1/2)/b^(3/2)/c^3-1/
8*d*FresnelC(10^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(5*a/b)*
10^(1/2)*Pi^(1/2)/b^(3/2)/c^3-2*d*x^2*(-c^2*x^2+1)^(3/2)/b/c/(a+b*arcsin(c*
x))^(1/2)
```

Rubi [A] (verified)

Time = 0.83 (sec) , antiderivative size = 591, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.296$, Rules used = {4799, 4809, 4491, 3387, 3386, 3432, 3385, 3433}

$$\begin{aligned}
\int \frac{x^2(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx &= -\frac{\sqrt{2\pi}d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3} \\
&+ \frac{5\sqrt{\frac{\pi}{2}}d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c^3} \\
&- \frac{\sqrt{\frac{2\pi}{3}}d\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3} \\
&+ \frac{5\sqrt{\frac{\pi}{6}}d\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c^3} \\
&- \frac{\sqrt{\frac{5\pi}{2}}d\sin\left(\frac{5a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c^3} \\
&+ \frac{\sqrt{2\pi}d\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3} \\
&- \frac{5\sqrt{\frac{\pi}{2}}d\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c^3} \\
&+ \frac{\sqrt{\frac{2\pi}{3}}d\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3} \\
&- \frac{5\sqrt{\frac{\pi}{6}}d\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c^3} \\
&+ \frac{\sqrt{\frac{5\pi}{2}}d\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c^3} - \frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}}
\end{aligned}$$

```
[In] Int[(x^2*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d*x^2*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (5*d*Sqrt[Pi
/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*b^(
3/2)*c^3) + (d*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
*x]])/Sqrt[b]])/(b^(3/2)*c^3) - (5*d*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sqrt
[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c^3) + (d*Sqrt[(2*Pi)/
3]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^
(3/2)*c^3) + (d*Sqrt[(5*Pi)/2]*Cos[(5*a)/b]*FresnelS[(Sqrt[10/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c^3) + (5*d*Sqrt[Pi/2]*FresnelC[(Sqrt[
2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*b^(3/2)*c^3) - (d*Sqrt
[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^
(3/2)*c^3) + (5*d*Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/
Sqrt[b]]*Sin[(3*a)/b])/(4*b^(3/2)*c^3) - (d*Sqrt[(2*Pi)/3]*FresnelC[(Sqrt[6
/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(b^(3/2)*c^3) - (d*Sqr
t[(5*Pi)/2]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*
a)/b])/(4*b^(3/2)*c^3)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(4d)\int \frac{x\sqrt{1-c^2x^2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{bc} - \frac{(10cd)\int \frac{x^3\sqrt{1-c^2x^2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{b} \\
&= -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{(4d)\text{Subst}\left(\int \frac{\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^3} \\
&\quad + \frac{(10d)\text{Subst}\left(\int \frac{\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^3} \\
&= -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{(4d)\text{Subst}\left(\int \left(\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}} + \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right)dx, x, a+b\arcsin(cx)\right)}{b^2c^3} \\
&\quad + \frac{(10d)\text{Subst}\left(\int \left(-\frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16\sqrt{x}} + \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16\sqrt{x}} + \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{8\sqrt{x}}\right)dx, x, a+b\arcsin(cx)\right)}{b^2c^3}
\end{aligned}$$

$$= -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{(5d)\text{Subst}\left(\int \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{8b^2c^3} + \frac{(5d)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{8b^2c^3} - \frac{d\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{b^2c^3} - \frac{d\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{b^2c^3} + \frac{(5d)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{4b^2c^3}$$

$$= -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{b^2c^3} - \frac{\left(5d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{4b^2c^3} - \frac{\left(5d\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{8b^2c^3} + \frac{\left(d\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{b^2c^3} + \frac{\left(5d\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{8b^2c^3} - \frac{\left(d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{b^2c^3} + \frac{\left(5d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{4b^2c^3} + \frac{\left(5d\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{8b^2c^3} - \frac{\left(d\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{b^2c^3} - \frac{\left(5d\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{\sqrt{x}}dx, x, a+b\arcsin(cx)\right)}{8b^2c^3}$$

$$= -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{\left(2d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^3}$$
$$- \frac{\left(5d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{2b^2c^3}$$
$$- \frac{\left(5d\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c^3}$$
$$+ \frac{\left(2d\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^3}$$
$$+ \frac{\left(5d\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{5x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c^3}$$
$$- \frac{\left(2d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^3}$$
$$+ \frac{\left(5d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{2b^2c^3}$$
$$+ \frac{\left(5d\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c^3}$$
$$- \frac{\left(2d\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^3}$$
$$- \frac{\left(5d\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{5x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c^3}$$

$$
\begin{aligned}
&= -\frac{2dx^2(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{5d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c^3} \\
&+ \frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3} \\
&- \frac{5d\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c^3} \\
&+ \frac{d\sqrt{\frac{2\pi}{3}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3} \\
&+ \frac{d\sqrt{\frac{5\pi}{2}}\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c^3} \\
&+ \frac{5d\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2b^{3/2}c^3} \\
&- \frac{d\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}c^3} \\
&+ \frac{5d\sqrt{\frac{\pi}{6}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{4b^{3/2}c^3} \\
&- \frac{d\sqrt{\frac{2\pi}{3}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{b^{3/2}c^3} \\
&- \frac{d\sqrt{\frac{5\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{4b^{3/2}c^3}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.23 (sec) , antiderivative size = 514, normalized size of antiderivative = 0.87

$$
\int \frac{x^2(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{de^{-\frac{5i(a+b\arcsin(cx))}{b}}\left(e^{\frac{5ia}{b}} + e^{\frac{5ia}{b}+2i\arcsin(cx)} - 2e^{\frac{5ia}{b}+4i\arcsin(cx)} - 2e^{\frac{5ia}{b}+6i\arcsin(cx)} + \right.}{}
$$

```
[In] Integrate[(x^2*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (d*(E^(((5*I)*a)/b) + E^(((5*I)*a)/b + (2*I)*ArcSin[c*x]) - 2*E^(((5*I)*a)/
b + (4*I)*ArcSin[c*x]) - 2*E^(((5*I)*a)/b + (6*I)*ArcSin[c*x]) + E^(((5*I)*
a)/b + (8*I)*ArcSin[c*x]) + E^(((5*I)*(a + 2*b*ArcSin[c*x]))/b) + 2*E^(((4*
I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2,
((-I)*(a + b*ArcSin[c*x]))/b] + 2*E^(((6*I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[
(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*
E^(((2*I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamm
a[1/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*E^(((8*I)*a)/b + (5*I)*Arc
Sin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c
*x]))/b] - Sqrt[5]*E^((5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]
*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[5]*E^(((5*I)*(2*a + b*Ar
cSin[c*x]))/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((5*I)*(a + b*Arc
Sin[c*x]))/b]))/(16*b*c^3*E^(((5*I)*(a + b*ArcSin[c*x]))/b)*Sqrt[a + b*ArcS
in[c*x]])
```

Maple [A] (verified)

Time = 0.15 (sec) , antiderivative size = 447, normalized size of antiderivative = 0.76

method	result
default	$-\frac{d\left(-2\sqrt{2}\,\sqrt{a+b\arcsin(cx)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}-2\sqrt{2}\,\sqrt{a+b\arcsin(cx)}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right.}{}$

```
[In] int(x^2*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/8/c^3*d/b*(-2*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/
Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)-2*2^
(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/
2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)+2^(1/2)*(-3/b)^(1/2)*(a
+b*arcsin(c*x))^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(
a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)+2^(1/2)*(-3/b)^(1/2)*(a+b*arcsin(c*x))^(
1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^
(1/2)/b)*Pi^(1/2)+cos(5*a/b)*FresnelS(5*2^(1/2)/Pi^(1/2)/(-5/b)^(1/2)*(a+b*
arcsin(c*x))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*(-5/b)^(1/2)
+sin(5*a/b)*FresnelC(5*2^(1/2)/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2
)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*(-5/b)^(1/2)+2*cos(-(a+b*arcs
in(c*x))/b+a/b)-cos(-3*(a+b*arcsin(c*x))/b+3*a/b)-cos(-5*(a+b*arcsin(c*x))/
b+5*a/b))/(a+b*arcsin(c*x))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{x^2(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{x^2(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = -d\left(\int \left(-\frac{x^2}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx + \int \frac{c^2x^4}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx\right)$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] -d*(Integral(-x**2/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin(
c*x)), x) + Integral(c**2*x**4/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin
(c*x))*asin(c*x)), x))
```

Maxima [F]

$$\int \frac{x^2(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \int -\frac{(c^2dx^2-d)x^2}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] -integrate((c^2*d*x^2 - d)*x^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{x^2(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \int -\frac{(c^2dx^2-d)x^2}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)*x^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{x^2\,(d-c^2\,d\,x^2)}{(a+b\,\mathrm{asin}\,(c\,x))^{3/2}}\,dx$$

```
[In] int((x^2*(d - c^2*d*x^2))/(a + b*asin(c*x))^(3/2),x)
[Out] int((x^2*(d - c^2*d*x^2))/(a + b*asin(c*x))^(3/2), x)
```

3.433 $\int \frac{x(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 241

$$\int \frac{x(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{d\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2} + \frac{d\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}c^2} + \frac{d\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}c^2} + \frac{d\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{b^{3/2}c^2}$$

```
[Out] 1/2*d*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2
))*2^(1/2)*Pi^(1/2)/b^(3/2)/c^2+1/2*d*FresnelS(2*2^(1/2)/Pi^(1/2)*(a+b*arcs
in(c*x))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c^2+d*cos(2*a/b
)*FresnelC(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/b^(3/2)/c^2
+d*FresnelS(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)
/b^(3/2)/c^2-2*d*x*(-c^2*x^2+1)^(3/2)/b/c/(a+b*arcsin(c*x))^(1/2)
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 241, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4799, 4753, 3393, 3387, 3386, 3432, 3385, 3433, 4809, 4491}

$$\int \frac{x(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{\sqrt{\frac{\pi}{2}}d\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2} + \frac{\sqrt{\pi}d\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}c^2} + \frac{\sqrt{\pi}d\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}c^2} + \frac{\sqrt{\frac{\pi}{2}}d\sin\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2} - \frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}}$$

```
[In] Int[(x*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d*x*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) + (d*Sqrt[Pi/2]*
Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(
3/2)*c^2) + (d*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(
Sqrt[b]*Sqrt[Pi])])/(b^(3/2)*c^2) + (d*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcS
in[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(b^(3/2)*c^2) + (d*Sqrt[Pi/2]*F
resnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/b])/(b^(3
/2)*c^2)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
```

```
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(2d)\int\frac{\sqrt{1-c^2x^2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{bc} - \frac{(8cd)\int\frac{x^2\sqrt{1-c^2x^2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{b}$$

$$= -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(2d)\text{Subst}\left(\int\frac{\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2} - \frac{(8d)\text{Subst}\left(\int\frac{\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2}$$

$$= -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(2d)\text{Subst}\left(\int\left(\frac{1}{2\sqrt{x}}+\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\right)dx,x,a+b\arcsin(cx)\right)}{b^2c^2} - \frac{(8d)\text{Subst}\left(\int\left(\frac{1}{8\sqrt{x}}-\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8\sqrt{x}}\right)dx,x,a+b\arcsin(cx)\right)}{b^2c^2}$$

$$= -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{d\text{Subst}\left(\int\frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2} + \frac{d\text{Subst}\left(\int\frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2}$$

$$= -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{\left(d\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2} + \frac{\left(d\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2} + \frac{\left(d\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2} + \frac{\left(d\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{b^2c^2}$$

$$= -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{\left(2d\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^2} + \frac{\left(2d\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{4x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^2} + \frac{\left(2d\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^2} + \frac{\left(2d\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{4x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^2}$$

$$= -\frac{2dx(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{d\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2} + \frac{d\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}c^2} + \frac{d\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}c^2} + \frac{d\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{b^{3/2}c^2}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.25 (sec) , antiderivative size = 276, normalized size of antiderivative = 1.15

$$\int \frac{x(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{ide^{-\frac{4ia}{b}}\left(-\sqrt{2}e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{1}{2},-\frac{2i(a+b\arcsin(cx))}{b}\right)+\sqrt{2}e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\arcsin(cx))}{b}}\cdots\right.}{\cdots}$$

```
[In] Integrate[(x*(d - c^2*d*x^2))/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] ((I/4)*d*(-(Sqrt[2]*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamm
a[1/2, ((-2*I)*(a + b*ArcSin[c*x]))/b]) + Sqrt[2]*E^(((6*I)*a)/b)*Sqrt[(I*(
a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[((-
I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-4*I)*(a + b*ArcSin[c*x]))/b] + E^(
((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((4*I)*(a + b*ArcSi
n[c*x]))/b] + (2*I)*E^(((4*I)*a)/b)*Sin[2*ArcSin[c*x]] + I*E^(((4*I)*a)/b)*
Sin[4*ArcSin[c*x]]))/(b*c^2*E^(((4*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 303, normalized size of antiderivative = 1.26

method	result
default	$\frac{d\left(2\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(cx)}\,\cos\left(\frac{4a}{b}\right)\mathrm{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)-2\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(cx)}\,\sin\left(\frac{4a}{b}\right)\mathrm{FresnelS}\left(\frac{2\sqrt{2}}{}\right.\right.}{}$

```
[In] int(x*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4/c^2*d/b*(2*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(4*
a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-2*
(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(4*a/b)*FresnelS(2
*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)+4*(-1/b)^(1/2)*co
s(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b
)*(a+b*arcsin(c*x))^(1/2)*Pi^(1/2)-4*(-1/b)^(1/2)*sin(2*a/b)*FresnelS(2*2^(
1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/
2)*Pi^(1/2)+2*sin(-2*(a+b*arcsin(c*x))/b+2*a/b)+sin(-4*(a+b*arcsin(c*x))/b+
4*a/b))/(a+b*arcsin(c*x))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{x(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{x(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = -d\left(\int\left(-\frac{x}{a\sqrt{a+b\,\mathrm{asin}\,(cx)}+b\sqrt{a+b\,\mathrm{asin}\,(cx)}\,\mathrm{asin}\,(cx)}\right)dx + \int\frac{c^2x^3}{a\sqrt{a+b\,\mathrm{asin}\,(cx)}+b\sqrt{a+b\,\mathrm{asin}\,(cx)}\,\mathrm{asin}\,(cx)}\,dx\right)$$

```
[In] integrate(x*(-c**2*d*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] -d*(Integral(-x/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin(c*x
)), x) + Integral(c**2*x**3/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*
x))*asin(c*x)), x))
```

Maxima [F]

$$\int \frac{x(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \int -\frac{(c^2dx^2-d)x}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
[Out] -integrate((c^2*d*x^2 - d)*x/(b*arcsin(c*x) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{x(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \int -\frac{(c^2dx^2-d)x}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x*(-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)*x/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(d-c^2dx^2)}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{x\,(d-c^2\,d\,x^2)}{(a+b\,\mathrm{asin}\,(c\,x))^{3/2}}\,dx$$

```
[In] int((x*(d - c^2*d*x^2))/(a + b*asin(c*x))^(3/2),x)
[Out] int((x*(d - c^2*d*x^2))/(a + b*asin(c*x))^(3/2), x)
```

3.434 $\int \frac{d-c^2dx^2}{(a+b\arcsin(cx))^{3/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 253

$$\int \frac{d-c^2dx^2}{(a+b\arcsin(cx))^{3/2}}\,dx = -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{3d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} - \frac{d\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} + \frac{3d\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}c} + \frac{d\sqrt{\frac{3\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{b^{3/2}c}$$

```
[Out] -3/2*d*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*
2^(1/2)*Pi^(1/2)/b^(3/2)/c+3/2*d*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x)
)^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c-1/2*d*cos(3*a/b)*Fresn
elS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/2)/b^(3
/2)/c+1/2*d*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(
3*a/b)*6^(1/2)*Pi^(1/2)/b^(3/2)/c-2*d*(-c^2*x^2+1)^(3/2)/b/c/(a+b*arcsin(c*
x))^(1/2)
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 253, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4751, 4809, 4491, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{d-c^2dx^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{3\sqrt{\frac{\pi}{2}}d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} + \frac{\sqrt{\frac{3\pi}{2}}d\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} - \frac{3\sqrt{\frac{\pi}{2}}d\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} - \frac{\sqrt{\frac{3\pi}{2}}d\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} - \frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}}$$

```
[In] Int[(d - c^2*d*x^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d*(1 - c^2*x^2)^(3/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (3*d*Sqrt[Pi/2]*
Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2)*c
) - (d*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c
*x]])/Sqrt[b]])/(b^(3/2)*c) + (3*d*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a +
 b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^(3/2)*c) + (d*Sqrt[(3*Pi)/2]*Fresnel
C[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(b^(3/2)*c)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
```

```
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rule steps

$$\text{integral} = -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{(6cd)\int \frac{x\sqrt{1-c^2x^2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{b}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(6d)\text{Subst}\left(\int \frac{\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(6d)\text{Subst}\left(\int \left(\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}} + \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right)\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(3d)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c} + \frac{(3d)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{\left(3d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c} - \frac{\left(3d\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c} + \frac{\left(3d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c} + \frac{\left(3d\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{\left(3d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2c} - \frac{\left(3d\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2c} + \frac{\left(3d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2c} + \frac{\left(3d\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2c}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{3d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} - \frac{d\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} + \frac{3d\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}c} + \frac{d\sqrt{\frac{3\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{b^{3/2}c}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.69 (sec) , antiderivative size = 348, normalized size of antiderivative = 1.38

$$\int \frac{d-c^2dx^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{de^{-\frac{3i(a+b\arcsin(cx))}{b}}\left(-e^{\frac{3ia}{b}}-3e^{\frac{3ia}{b}+2i\arcsin(cx)}-3e^{\frac{3ia}{b}+4i\arcsin(cx)}-e^{\frac{3i(a+2b\arcsin(cx))}{b}}+\right.}{}$$

[In] Integrate[(d - c^2*d*x^2)/(a + b*ArcSin[c*x])^(3/2),x]

[Out] (d*(-E^(((3*I)*a)/b) - 3*E^(((3*I)*a)/b + (2*I)*ArcSin[c*x]) - 3*E^(((3*I)*a)/b + (4*I)*ArcSin[c*x]) - E^(((3*I)*(a + 2*b*ArcSin[c*x]))/b) + 3*E^(((2*I)*a)/b + (3*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 3*E^(((4*I)*a)/b + (3*I)*ArcSin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b] + Sqrt[3]*E^((3*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] + Sqrt[3]*E^((3*I)*((2*a)/b + ArcSin[c*x]))*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c*x]))/b]))/(4*b*c*E^(((3*I)*(a + b*ArcSin[c*x]))/b)*Sqrt[a + b*ArcSin[c*x]])

Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 304, normalized size of antiderivative = 1.20

method	result
default	$-\frac{d\left(-3\sqrt{2}\,\sqrt{a+b\arcsin(cx)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}-3\sqrt{2}\,\sqrt{a+b\arcsin(cx)}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right.\right.}{}$

[In] int((-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)

[Out] -1/2/c*d/b/(a+b*arcsin(c*x))^(1/2)*(-3*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)-3*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)-2^(1/2)*(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)-2^(1/2)*(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)+3*cos(-(a+b*arcsin(c*x))/b+a/b)+cos(-3*(a+b*arcsin(c*x))/b+3*a/b))

Fricas [F(-2)]

Exception generated.

$$\int \frac{d-c^2dx^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{d-c^2dx^2}{(a+b\arcsin(cx))^{3/2}}\,dx = -d\left(\int \frac{c^2x^2}{a\sqrt{a+b\,\mathrm{asin}\,(cx)}+b\sqrt{a+b\,\mathrm{asin}\,(cx)}\,\mathrm{asin}\,(cx)}\,dx + \int \left(-\frac{1}{a\sqrt{a+b\,\mathrm{asin}\,(cx)}+b\sqrt{a+b\,\mathrm{asin}\,(cx)}\,\mathrm{asin}\,(cx)}\right)dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] -d*(Integral(c**2*x**2/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*a
sin(c*x)), x) + Integral(-1/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*
x))*asin(c*x)), x))
```

Maxima [F]

$$\int \frac{d-c^2dx^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \int -\frac{c^2dx^2-d}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] -integrate((c^2*d*x^2 - d)/(b*arcsin(c*x) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{d-c^2dx^2}{(a+b\arcsin(cx))^{3/2}}\,dx=\int -\frac{c^2dx^2-d}{(b\arcsin{(cx)}+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] integrate(-(c^2*d*x^2 - d)/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{d-c^2dx^2}{(a+b\arcsin(cx))^{3/2}}\,dx=\int \frac{d-c^2\,d\,x^2}{(a+b\,\mathrm{asin}\,(c\,x))^{3/2}}\,dx$$

```
[In] int((d - c^2*d*x^2)/(a + b*asin(c*x))^(3/2),x)
[Out] int((d - c^2*d*x^2)/(a + b*asin(c*x))^(3/2), x)
```

3.435 $\int \frac{d-c^2dx^2}{x(a+b\arcsin(cx))^{3/2}} dx$

Optimal result

Integrand size = 27, antiderivative size = 27

$$\int \frac{d-c^2dx^2}{x(a+b\arcsin(cx))^{3/2}}\,dx = -\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\arcsin(cx)}} - \frac{2d\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}} - \frac{2d\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}} - \frac{2d\text{Int}\left(\frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}},x\right)}{bc}$$

```
[Out] -2*d*cos(2*a/b)*FresnelC(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/
2)/b^(3/2)-2*d*FresnelS(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a
/b)*Pi^(1/2)/b^(3/2)-2*d*(-c^2*x^2+1)^(3/2)/b/c/x/(a+b*arcsin(c*x))^(1/2)-2
*d*Unintegrable(1/x^2/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^(1/2),x)/b/c
```

Rubi [N/A]

Not integrable

Time = 0.46 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{d-c^2dx^2}{x(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{d-c^2dx^2}{x(a+b\arcsin(cx))^{3/2}}\,dx$$

```
[In] Int[(d - c^2*d*x^2)/(x*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] (-2*d*(1 - c^2*x^2)^(3/2))/(b*c*x*Sqrt[a + b*ArcSin[c*x]]) - (2*d*Sqrt[Pi]*
Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])])/b^(3
```

```
/2) - (2*d*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])
]*Sin[(2*a)/b])/b^(3/2) - (2*d*Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*Sqrt[a +
 b*ArcSin[c*x]]), x])/(b*c)
```

Rubi steps

$$\text{integral} = -\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\arcsin(cx)}} - \frac{(2d)\int \frac{\sqrt{1-c^2x^2}}{x^2\sqrt{a+b\arcsin(cx)}}\,dx}{bc} - \frac{(4cd)\int \frac{\sqrt{1-c^2x^2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{b}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\arcsin(cx)}} - \frac{(4d)\text{Subst}\left(\int \frac{\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{(2d)\int \left(-\frac{c^2}{\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}} + \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\right)\,dx}{bc}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\arcsin(cx)}} - \frac{(4d)\text{Subst}\left(\int \left(\frac{1}{2\sqrt{x}} + \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\right)\,dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{(2d)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx}{bc} + \frac{(2cd)\int \frac{1}{\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx}{b}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\arcsin(cx)}} - \frac{(2d)\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{(2d)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx}{bc}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\arcsin(cx)}} - \frac{(2d)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx}{bc} - \frac{\left(2d\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{\left(2d\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\arcsin(cx)}} - \frac{(2d)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx}{bc} - \frac{\left(4d\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2} - \frac{\left(4d\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2}$$

$$= -\frac{2d(1-c^2x^2)^{3/2}}{bcx\sqrt{a+b\arcsin(cx)}} - \frac{2d\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}} - \frac{2d\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}} - \frac{(2d)\int\frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}dx}{bc}$$

Mathematica [N/A]

Not integrable

Time = 0.84 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.07

$$\int\frac{d-c^2dx^2}{x(a+b\arcsin(cx))^{3/2}}\,dx = \int\frac{d-c^2dx^2}{x(a+b\arcsin(cx))^{3/2}}\,dx$$

```
[In] Integrate[(d - c^2*d*x^2)/(x*(a + b*ArcSin[c*x])^(3/2)),x]
[Out] Integrate[(d - c^2*d*x^2)/(x*(a + b*ArcSin[c*x])^(3/2)), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.18 (sec) , antiderivative size = 25, normalized size of antiderivative = 0.93

$$\int\frac{-c^2d\,x^2+d}{x\left(a+b\arcsin\left(cx\right)\right)^{\frac{3}{2}}}dx$$

```
[In] int((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x)
[Out] int((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int\frac{d-c^2dx^2}{x(a+b\arcsin(cx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 4.24 (sec) , antiderivative size = 87, normalized size of antiderivative = 3.22

$$\int \frac{d-c^2dx^2}{x(a+b\arcsin(cx))^{3/2}}\,dx = -d\left(\int \frac{c^2x^2}{ax\sqrt{a+b\operatorname{asin}(cx)}+bx\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx + \int \left(-\frac{1}{ax\sqrt{a+b\operatorname{asin}(cx)}+bx\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)/x/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] -d*(Integral(c**2*x**2/(a*x*sqrt(a + b*asin(c*x)) + b*x*sqrt(a + b*asin(c*x
))*asin(c*x)), x) + Integral(-1/(a*x*sqrt(a + b*asin(c*x)) + b*x*sqrt(a + b
*asin(c*x))*asin(c*x)), x))
```

Maxima [N/A]

Not integrable

Time = 0.90 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.11

$$\int \frac{d-c^2dx^2}{x(a+b\arcsin(cx))^{3/2}}\,dx = \int -\frac{c^2dx^2-d}{(b\arcsin(cx)+a)^{\frac{3}{2}}x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] -integrate((c^2*d*x^2 - d)/((b*arcsin(c*x) + a)^(3/2)*x), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{d-c^2dx^2}{x(a+b\arcsin(cx))^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((-c^2*d*x^2+d)/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.18 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00

$$\int \frac{d-c^2dx^2}{x(a+b\arcsin(cx))^{3/2}}\,dx=\int \frac{d-c^2\,d\,x^2}{x\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^{3/2}}\,dx$$

```
[In] int((d - c^2*d*x^2)/(x*(a + b*asin(c*x))^(3/2)),x)
[Out] int((d - c^2*d*x^2)/(x*(a + b*asin(c*x))^(3/2)), x)
```

3.436 $\int \frac{x^3(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 485

$$\begin{aligned}
\int \frac{x^3(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = &-\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} \\
&+\frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4} \\
&-\frac{d^2\sqrt{3\pi}\cos\left(\frac{6a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^4} \\
&+\frac{3d^2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16b^{3/2}c^4} \\
&-\frac{d^2\sqrt{\pi}\cos\left(\frac{8a}{b}\right)\operatorname{FresnelC}\left(\frac{4\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16b^{3/2}c^4} \\
&+\frac{3d^2\sqrt{\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{16b^{3/2}c^4} \\
&+\frac{d^2\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{8b^{3/2}c^4} \\
&-\frac{d^2\sqrt{3\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{6a}{b}\right)}{16b^{3/2}c^4} \\
&-\frac{d^2\sqrt{\pi}\operatorname{FresnelS}\left(\frac{4\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{8a}{b}\right)}{16b^{3/2}c^4}
\end{aligned}$$

```
[Out] 1/16*d^2*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(
1/2))*2^(1/2)*Pi^(1/2)/b^(3/2)/c^4+1/16*d^2*FresnelS(2*2^(1/2)/Pi^(1/2)*(a+
b*arcsin(c*x))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c^4+3/16*
d^2*cos(2*a/b)*FresnelC(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2
)/b^(3/2)/c^4-1/16*d^2*cos(8*a/b)*FresnelC(4*(a+b*arcsin(c*x))^(1/2)/b^(1/2
)/Pi^(1/2))*Pi^(1/2)/b^(3/2)/c^4+3/16*d^2*FresnelS(2*(a+b*arcsin(c*x))^(1/2
)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/b^(3/2)/c^4-1/16*d^2*FresnelS(4*(a+
b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*sin(8*a/b)*Pi^(1/2)/b^(3/2)/c^4-1/16
*d^2*cos(6*a/b)*FresnelC(2*3^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2)
)*3^(1/2)*Pi^(1/2)/b^(3/2)/c^4-1/16*d^2*FresnelS(2*3^(1/2)/Pi^(1/2)*(a+b*ar
csin(c*x))^(1/2)/b^(1/2))*sin(6*a/b)*3^(1/2)*Pi^(1/2)/b^(3/2)/c^4-2*d^2*x^3
*(-c^2*x^2+1)^(5/2)/b/c/(a+b*arcsin(c*x))^(1/2)
```

Rubi [A] (verified)

Time = 0.87 (sec) , antiderivative size = 485, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.276$, Rules used = {4799, 4809, 4491, 3387, 3386, 3432, 3385, 3433}

$$\begin{aligned}\int \frac{x^3(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx &= \frac{\sqrt{\frac{\pi}{2}}d^2\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4}\\
&-\frac{\sqrt{3\pi}d^2\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^4}\\
&+\frac{3\sqrt{\pi}d^2\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16b^{3/2}c^4}\\
&-\frac{\sqrt{\pi}d^2\cos\left(\frac{8a}{b}\right)\text{FresnelC}\left(\frac{4\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16b^{3/2}c^4}\\
&+\frac{3\sqrt{\pi}d^2\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16b^{3/2}c^4}\\
&+\frac{\sqrt{\frac{\pi}{2}}d^2\sin\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4}\\
&-\frac{\sqrt{3\pi}d^2\sin\left(\frac{6a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^4}\\
&-\frac{\sqrt{\pi}d^2\sin\left(\frac{8a}{b}\right)\text{FresnelS}\left(\frac{4\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16b^{3/2}c^4}-\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}}\end{aligned}$$

```
[In] Int[(x^3*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d^2*x^3*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) + (d^2*Sqrt[
Pi/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]
)/(8*b^(3/2)*c^4) - (d^2*Sqrt[3*Pi]*Cos[(6*a)/b]*FresnelC[(2*Sqrt[3/Pi]*Sqr
t[a + b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3/2)*c^4) + (3*d^2*Sqrt[Pi]*Cos[(2*a
)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])])/(16*b^(3/2)*
c^4) - (d^2*Sqrt[Pi]*Cos[(8*a)/b]*FresnelC[(4*Sqrt[a + b*ArcSin[c*x]])/(Sqr
t[b]*Sqrt[Pi])])/(16*b^(3/2)*c^4) + (3*d^2*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*
ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(16*b^(3/2)*c^4) + (d^2*Sqr
t[Pi/2]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/
b])/(8*b^(3/2)*c^4) - (d^2*Sqrt[3*Pi]*FresnelS[(2*Sqrt[3/Pi]*Sqrt[a + b*Arc
Sin[c*x]])/Sqrt[b]]*Sin[(6*a)/b])/(16*b^(3/2)*c^4) - (d^2*Sqrt[Pi]*FresnelS
[(4*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(8*a)/b])/(16*b^(3/2)*
c^4)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
```

```
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(6d^2)\int\frac{x^2(1-c^2x^2)^{3/2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{bc} - \frac{(16cd^2)\int\frac{x^4(1-c^2x^2)^{3/2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{b}$$

$$= -\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(6d^2)\,\text{Subst}\left(\int\frac{\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^4} - \frac{(16d^2)\,\text{Subst}\left(\int\frac{\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^4}$$

$$= -\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(6d^2)\,\text{Subst}\left(\int\left(\frac{1}{16\sqrt{x}} - \frac{\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)}{32\sqrt{x}} - \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{16\sqrt{x}} + \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{32\sqrt{x}}\right)dx, x, a+b\arcsin(cx)\right)}{b^2c^4} - \frac{(16d^2)\,\text{Subst}\left(\int\left(\frac{3}{128\sqrt{x}} + \frac{\cos\left(\frac{8a}{b}-\frac{8x}{b}\right)}{128\sqrt{x}} - \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{32\sqrt{x}}\right)dx, x, a+b\arcsin(cx)\right)}{b^2c^4}$$

$$= -\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{d^2\text{Subst}\left(\int \frac{\cos\left(\frac{8a}{b}-\frac{8x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^4}$$
$$- \frac{(3d^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^4}$$
$$+ \frac{(3d^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^4}$$
$$- \frac{(3d^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^4}$$
$$+ \frac{d^2\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c^4}$$

$$= -\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{\left(3d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^4}$$
$$- \frac{\left(3d^2\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^4}$$
$$+ \frac{\left(d^2\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c^4}$$
$$- \frac{\left(3d^2\cos\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{6x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^4}$$
$$- \frac{\left(d^2\cos\left(\frac{8a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{8x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^4}$$
$$+ \frac{\left(3d^2\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^4}$$
$$- \frac{\left(3d^2\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^4}$$
$$+ \frac{\left(d^2\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c^4}$$
$$- \frac{\left(3d^2\sin\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{6x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{16b^2c^4}$$
$$- \frac{\left(d^2\sin\left(\frac{8a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{8x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^4}$$

$$
\begin{aligned}
&= -\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} \\
&+ \frac{\left(3d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{8b^2c^4} \\
&- \frac{\left(3d^2\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{4x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c^4} \\
&+ \frac{\left(d^2\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{4x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^4} \\
&- \frac{\left(3d^2\cos\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{6x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{8b^2c^4} \\
&- \frac{\left(d^2\cos\left(\frac{8a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{8x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c^4} \\
&+ \frac{\left(3d^2\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{8b^2c^4} \\
&- \frac{\left(3d^2\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{4x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c^4} \\
&+ \frac{\left(d^2\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{4x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^4} \\
&- \frac{\left(3d^2\sin\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{6x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{8b^2c^4} \\
&- \frac{\left(d^2\sin\left(\frac{8a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{8x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c^4}
\end{aligned}
$$

$$= -\frac{2d^2x^3(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^4}$$
$$-\frac{d^2\sqrt{3\pi}\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^4}$$
$$+\frac{3d^2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16b^{3/2}c^4}$$
$$-\frac{d^2\sqrt{\pi}\cos\left(\frac{8a}{b}\right)\text{FresnelC}\left(\frac{4\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16b^{3/2}c^4}$$
$$+\frac{3d^2\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{16b^{3/2}c^4}$$
$$+\frac{d^2\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{8b^{3/2}c^4}$$
$$-\frac{d^2\sqrt{3\pi}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{6a}{b}\right)}{16b^{3/2}c^4}$$
$$-\frac{d^2\sqrt{\pi}\,\text{FresnelS}\left(\frac{4\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{8a}{b}\right)}{16b^{3/2}c^4}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.41 (sec) , antiderivative size = 540, normalized size of antiderivative = 1.11

$$\int \frac{x^3(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx =$$
$$-\frac{id^2e^{-\frac{8ia}{b}}\left(3\sqrt{2}e^{\frac{6ia}{b}}\sqrt{-\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{1}{2},-\frac{2i(a+b\arcsin(cx))}{b}\right)-3\sqrt{2}e^{\frac{10ia}{b}}\sqrt{\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{1}{2},\frac{2i(a+b\arcsin(cx))}{b}\right)\right.}{}$$

```
[In] Integrate[(x^3*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] ((-1/64*I)*d^2*(3*Sqrt[2]*E^(((6*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b
]*Gamma[1/2, ((-2*I)*(a + b*ArcSin[c*x]))/b] - 3*Sqrt[2]*E^(((10*I)*a)/b)*S
qrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c*x]))/b] +
2*E^(((4*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-4*I)*(a
+ b*ArcSin[c*x]))/b] - 2*E^(((12*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*G
amma[1/2, ((4*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[6]*E^(((2*I)*a)/b)*Sqrt[((-
I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-6*I)*(a + b*ArcSin[c*x]))/b] + Sqr
```

```
t[6]*E^(((14*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((6*I)*(a
+ b*ArcSin[c*x]))/b] - Sqrt[2]*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2
, ((-8*I)*(a + b*ArcSin[c*x]))/b] + Sqrt[2]*E^(((16*I)*a)/b)*Sqrt[(I*(a + b
*ArcSin[c*x]))/b]*Gamma[1/2, ((8*I)*(a + b*ArcSin[c*x]))/b] - (6*I)*E^(((8*
I)*a)/b)*Sin[2*ArcSin[c*x]] - (2*I)*E^(((8*I)*a)/b)*Sin[4*ArcSin[c*x]] + (2
*I)*E^(((8*I)*a)/b)*Sin[6*ArcSin[c*x]] + I*E^(((8*I)*a)/b)*Sin[8*ArcSin[c*x
]]))/(b*c^4*E^(((8*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 591, normalized size of antiderivative = 1.22

method	result
default	$d^2\left(4\sqrt{-\frac{1}{b}}\sqrt{\pi}\sqrt{2}\sqrt{a+b\arcsin(cx)}\cos\left(\frac{4a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{2}\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)-4\sqrt{-\frac{1}{b}}\sqrt{\pi}\sqrt{2}\sqrt{a+b\arcsin(cx)}\sin\left(\frac{4a}{b}\right)\operatorname{FresnelS}(2\right.$

```
[In] int(x^3*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/64/c^4*d^2/b*(4*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos
(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)
-4*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(4*a/b)*Fresnel
S(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-2*(a+b*arcsin(
c*x))^(1/2)*(-6/b)^(1/2)*cos(6*a/b)*FresnelC(6*2^(1/2)/Pi^(1/2)/(-6/b)^(1/2
)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*2^(1/2)+2*(a+b*arcsin(c*x))^(1/2)*(-6
/b)^(1/2)*sin(6*a/b)*FresnelS(6*2^(1/2)/Pi^(1/2)/(-6/b)^(1/2)*(a+b*arcsin(c
*x))^(1/2)/b)*Pi^(1/2)*2^(1/2)-4*cos(8*a/b)*FresnelC(4*2^(1/2)/Pi^(1/2)/(-2
/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*Pi^(1/2)*(-1/b
)^(1/2)+4*sin(8*a/b)*FresnelS(4*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(c
*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*Pi^(1/2)*(-1/b)^(1/2)+12*(-1/b)^(1/2)
*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(c*x))^(1/2
)/b)*(a+b*arcsin(c*x))^(1/2)*Pi^(1/2)-12*(-1/b)^(1/2)*sin(2*a/b)*FresnelS(2
*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))
^(1/2)*Pi^(1/2)-2*sin(-6*(a+b*arcsin(c*x))/b+6*a/b)-sin(-8*(a+b*arcsin(c*x)
)/b+8*a/b)+6*sin(-2*(a+b*arcsin(c*x))/b+2*a/b)+2*sin(-4*(a+b*arcsin(c*x))/b
+4*a/b))/(a+b*arcsin(c*x))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{x^3(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas
")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{x^3(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = d^2\left(\int \frac{x^3}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx + \int \left(-\frac{2c^2x^5}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx + \int \frac{c^4x^7}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx\right)$$

```
[In] integrate(x**3*(-c**2*d*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] d**2*(Integral(x**3/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin
(c*x)), x) + Integral(-2*c**2*x**5/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*
asin(c*x))*asin(c*x)), x) + Integral(c**4*x**7/(a*sqrt(a + b*asin(c*x)) + b
*sqrt(a + b*asin(c*x))*asin(c*x)), x))
```

Maxima [F]

$$\int \frac{x^3(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{(c^2dx^2-d)^2x^3}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima
")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*x^3/(b*arcsin(c*x) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{x^3(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{(c^2dx^2-d)^2x^3}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^3*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] integrate((c^2*d*x^2 - d)^2*x^3/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{x^3\,(d-c^2\,d\,x^2)^2}{(a+b\,\mathrm{asin}\,(c\,x))^{3/2}}\,dx$$

```
[In] int((x^3*(d - c^2*d*x^2)^2)/(a + b*asin(c*x))^(3/2),x)
[Out] int((x^3*(d - c^2*d*x^2)^2)/(a + b*asin(c*x))^(3/2), x)
```

3.437 $\int \frac{x^2(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 511

$$\int \frac{x^2(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{5d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3} + \frac{d^2\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3} + \frac{3d^2\sqrt{\frac{5\pi}{2}}\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3} + \frac{d^2\sqrt{\frac{7\pi}{2}}\cos\left(\frac{7a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{14}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3} + \frac{5d^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{16b^{3/2}c^3} - \frac{d^2\sqrt{\frac{3\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{16b^{3/2}c^3} - \frac{3d^2\sqrt{\frac{5\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{16b^{3/2}c^3} - \frac{d^2\sqrt{\frac{7\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{14}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{7a}{b}\right)}{16b^{3/2}c^3}$$

```
[Out] -5/32*d^2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2
))*2^(1/2)*Pi^(1/2)/b^(3/2)/c^3+5/32*d^2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arc
sin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c^3+1/32*d^2*cos
(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*6^(1/2)*
Pi^(1/2)/b^(3/2)/c^3-1/32*d^2*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(
1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(3/2)/c^3+3/32*d^2*cos(5*a/b)*F
resnelS(10^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*10^(1/2)*Pi^(1/2
)/b^(3/2)/c^3-3/32*d^2*FresnelC(10^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b
^(1/2))*sin(5*a/b)*10^(1/2)*Pi^(1/2)/b^(3/2)/c^3+1/32*d^2*cos(7*a/b)*Fresne
lS(14^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*14^(1/2)*Pi^(1/2)/b^(
3/2)/c^3-1/32*d^2*FresnelC(14^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2
))*sin(7*a/b)*14^(1/2)*Pi^(1/2)/b^(3/2)/c^3-2*d^2*x^2*(-c^2*x^2+1)^(5/2)/b/
c/(a+b*arcsin(c*x))^(1/2)
```

Rubi [A] (verified)

Time = 1.10 (sec) , antiderivative size = 511, normalized size of antiderivative = 1.00, number of steps used = 42, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.276, Rules used = {4799, 4809, 4491, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{x^2(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{5\sqrt{\frac{\pi}{2}}d^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3} - \frac{\sqrt{\frac{3\pi}{2}}d^2\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3} - \frac{3\sqrt{\frac{5\pi}{2}}d^2\sin\left(\frac{5a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3} - \frac{\sqrt{\frac{7\pi}{2}}d^2\sin\left(\frac{7a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{14}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3} - \frac{5\sqrt{\frac{\pi}{2}}d^2\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3} + \frac{\sqrt{\frac{3\pi}{2}}d^2\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3} + \frac{3\sqrt{\frac{5\pi}{2}}d^2\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3} + \frac{\sqrt{\frac{7\pi}{2}}d^2\cos\left(\frac{7a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{14}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3} - \frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}}$$

```
[In] Int[(x^2*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d^2*x^2*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (5*d^2*Sqr
t[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(1
6*b^(3/2)*c^3) + (d^2*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt
[a + b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3/2)*c^3) + (3*d^2*Sqrt[(5*Pi)/2]*Cos
[(5*a)/b]*FresnelS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3
/2)*c^3) + (d^2*Sqrt[(7*Pi)/2]*Cos[(7*a)/b]*FresnelS[(Sqrt[14/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(16*b^(3/2)*c^3) + (5*d^2*Sqrt[Pi/2]*FresnelC[(Sq
rt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(16*b^(3/2)*c^3) - (d^
2*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin
[(3*a)/b])/(16*b^(3/2)*c^3) - (3*d^2*Sqrt[(5*Pi)/2]*FresnelC[(Sqrt[10/Pi]*S
qrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(16*b^(3/2)*c^3) - (d^2*Sqrt
```

```
[(7*Pi)/2]*FresnelC[(Sqrt[14/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(7*a
)/b])/(16*b^(3/2)*c^3)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
```

```
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(4d^2)\int \frac{x(1-c^2x^2)^{3/2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{bc} - \frac{(14cd^2)\int \frac{x^3(1-c^2x^2)^{3/2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{b} \\
&= -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{(4d^2)\,\text{Subst}\left(\int \frac{\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^3} \\
&\quad + \frac{(14d^2)\,\text{Subst}\left(\int \frac{\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^3} \\
&= -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} \\
&\quad - \frac{(4d^2)\,\text{Subst}\left(\int \left(\frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16\sqrt{x}} + \frac{3\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16\sqrt{x}} + \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{8\sqrt{x}}\right)dx, x, a+b\arcsin(cx)\right)}{b^2c^3} \\
&\quad + \frac{(14d^2)\,\text{Subst}\left(\int \left(-\frac{\sin\left(\frac{7a}{b}-\frac{7x}{b}\right)}{64\sqrt{x}} - \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{64\sqrt{x}} + \frac{3\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{64\sqrt{x}} + \frac{3\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{64\sqrt{x}}\right)dx, x, a+b\arcsin(cx)\right)}{b^2c^3}
\end{aligned}$$

$$= -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{(7d^2)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{7a}{b}-\frac{7x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{32b^2c^3}$$
$$- \frac{(7d^2)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{32b^2c^3}$$
$$- \frac{d^2\operatorname{Subst}\left(\int \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^3}$$
$$- \frac{d^2\operatorname{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{2b^2c^3}$$
$$+ \frac{(21d^2)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{32b^2c^3}$$
$$+ \frac{(21d^2)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{32b^2c^3}$$
$$- \frac{(3d^2)\operatorname{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^3}$$

$$= -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{\left(d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3}$$
$$-\frac{\left(21d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{32b^2c^3}$$
$$-\frac{\left(21d^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{32b^2c^3}$$
$$+\frac{\left(3d^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{4b^2c^3}$$
$$+\frac{\left(7d^2\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{5x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{32b^2c^3}$$
$$+\frac{\left(d^2\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{5x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{4b^2c^3}$$
$$+\frac{\left(7d^2\cos\left(\frac{7a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{7x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{32b^2c^3}$$
$$-\frac{\left(d^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3}$$
$$+\frac{\left(21d^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{32b^2c^3}$$
$$+\frac{\left(21d^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{32b^2c^3}$$
$$-\frac{\left(3d^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{4b^2c^3}$$
$$-\frac{\left(7d^2\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{5x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{32b^2c^3}$$
$$-\frac{\left(d^2\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{5x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{4b^2c^3}$$
$$-\frac{\left(7d^2\sin\left(\frac{7a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{7x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{32b^2c^3}$$

$$= -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{\left(d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^3}$$
$$-\frac{\left(21d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{16b^2c^3}$$
$$-\frac{\left(21d^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{16b^2c^3}$$
$$+\frac{\left(3d^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{2b^2c^3}$$
$$+\frac{\left(7d^2\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{5x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{16b^2c^3}$$
$$+\frac{\left(d^2\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{5x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{2b^2c^3}$$
$$+\frac{\left(7d^2\cos\left(\frac{7a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{7x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{16b^2c^3}$$
$$-\frac{\left(d^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^3}$$
$$+\frac{\left(21d^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{16b^2c^3}$$
$$+\frac{\left(21d^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{16b^2c^3}$$
$$-\frac{\left(3d^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{2b^2c^3}$$
$$-\frac{\left(7d^2\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{5x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{16b^2c^3}$$
$$-\frac{\left(d^2\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{5x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{2b^2c^3}$$
$$-\frac{\left(7d^2\sin\left(\frac{7a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{7x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{16b^2c^3}$$

$$= -\frac{2d^2x^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{5d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}$$
$$+ \frac{d^2\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}$$
$$+ \frac{3d^2\sqrt{\frac{5\pi}{2}}\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}$$
$$+ \frac{d^2\sqrt{\frac{7\pi}{2}}\cos\left(\frac{7a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{14}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16b^{3/2}c^3}$$
$$+ \frac{5d^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{16b^{3/2}c^3}$$
$$- \frac{d^2\sqrt{\frac{3\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{16b^{3/2}c^3}$$
$$- \frac{3d^2\sqrt{\frac{5\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{16b^{3/2}c^3}$$
$$- \frac{d^2\sqrt{\frac{7\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{14}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{7a}{b}\right)}{16b^{3/2}c^3}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.35 (sec) , antiderivative size = 686, normalized size of antiderivative = 1.34

$$\int \frac{x^2(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{d^2e^{-\frac{7i(a+b\arcsin(cx))}{b}}\left(e^{\frac{7ia}{b}} + 3e^{\frac{7ia}{b}+2i\arcsin(cx)} + e^{\frac{7ia}{b}+4i\arcsin(cx)} - 5e^{\frac{7ia}{b}+6i\arcsin(cx)} - \right.}{}$$

```
[In] Integrate[(x^2*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (d^2*(E^(((7*I)*a)/b) + 3*E^(((7*I)*a)/b + (2*I)*ArcSin[c*x]) + E^(((7*I)*a
)/b + (4*I)*ArcSin[c*x]) - 5*E^(((7*I)*a)/b + (6*I)*ArcSin[c*x]) - 5*E^(((7
*I)*a)/b + (8*I)*ArcSin[c*x]) + E^(((7*I)*a)/b + (10*I)*ArcSin[c*x]) + 3*E^
(((7*I)*a)/b + (12*I)*ArcSin[c*x]) + E^(((7*I)*(a + 2*b*ArcSin[c*x]))/b) +
5*E^(((6*I)*a)/b + (7*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Ga
mma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 5*E^(((8*I)*a)/b + (7*I)*ArcSin[c*
x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b] -
```

```
Sqrt[3]*E^(((4*I)*a)/b + (7*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x])
)/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*E^(((10*I)*a)/b +
 (7*I)*ArcSin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((3*I)*(a +
b*ArcSin[c*x]))/b] - 3*Sqrt[5]*E^(((2*I)*a)/b + (7*I)*ArcSin[c*x])*Sqrt[((-
I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] - 3*S
qrt[5]*E^(((12*I)*a)/b + (7*I)*ArcSin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]
*Gamma[1/2, ((5*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[7]*E^((7*I)*ArcSin[c*x])*
Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-7*I)*(a + b*ArcSin[c*x]))/
b] - Sqrt[7]*E^(((7*I)*(2*a + b*ArcSin[c*x]))/b)*Sqrt[(I*(a + b*ArcSin[c*x]
))/b]*Gamma[1/2, ((7*I)*(a + b*ArcSin[c*x]))/b]))/(64*b*c^3*E^(((7*I)*(a +
b*ArcSin[c*x]))/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] (verified)

Time = 0.17 (sec) , antiderivative size = 594, normalized size of antiderivative = 1.16

method	result
default	$-\frac{d^2\left(3\cos\left(\frac{5a}{b}\right)\mathrm{FresnelS}\left(\frac{5\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{5}{b}}\,b}\right)\sqrt{2}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(cx)}\,\sqrt{-\frac{5}{b}}+3\sin\left(\frac{5a}{b}\right)\mathrm{FresnelC}\left(\frac{5\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{5}{b}}\,b}\right)\sqrt{2}\,\sqrt{\pi}\,\sqrt{\right.}}{}$

```
[In] int(x^2*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/32/c^3*d^2/b/(a+b*arcsin(c*x))^(1/2)*(3*cos(5*a/b)*FresnelS(5*2^(1/2)/Pi
^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin
(c*x))^(1/2)*(-5/b)^(1/2)+3*sin(5*a/b)*FresnelC(5*2^(1/2)/Pi^(1/2)/(-5/b)^(
1/2)*(a+b*arcsin(c*x))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*(-
5/b)^(1/2)-5*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(
1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)-5*2^(1/2
)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(
a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)+2^(1/2)*(-3/b)^(1/2)*(a+b*a
rcsin(c*x))^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*
arcsin(c*x))^(1/2)/b)*Pi^(1/2)+2^(1/2)*(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)
*sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2
)/b)*Pi^(1/2)+Pi^(1/2)*2^(1/2)*cos(7*a/b)*FresnelS(7*2^(1/2)/Pi^(1/2)/(-7/b
)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*(-7/b)^(1/2)+Pi^
(1/2)*2^(1/2)*sin(7*a/b)*FresnelC(7*2^(1/2)/Pi^(1/2)/(-7/b)^(1/2)*(a+b*arcs
in(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*(-7/b)^(1/2)+5*cos(-(a+b*arcsin(c
*x))/b+a/b)-cos(-3*(a+b*arcsin(c*x))/b+3*a/b)-3*cos(-5*(a+b*arcsin(c*x))/b+
5*a/b)-cos(-7*(a+b*arcsin(c*x))/b+7*a/b))
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{x^2(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas
")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{x^2(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = d^2\left(\int \frac{x^2}{a\sqrt{a+b\,\mathrm{asin}\,(cx)}+b\sqrt{a+b\,\mathrm{asin}\,(cx)}\,\mathrm{asin}\,(cx)}\,dx + \int \left(-\frac{2c^2x^4}{a\sqrt{a+b\,\mathrm{asin}\,(cx)}+b\sqrt{a+b\,\mathrm{asin}\,(cx)}\,\mathrm{asin}\,(cx)}\right)dx + \int \frac{c^4x^6}{a\sqrt{a+b\,\mathrm{asin}\,(cx)}+b\sqrt{a+b\,\mathrm{asin}\,(cx)}\,\mathrm{asin}\,(cx)}\,dx\right)$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] d**2*(Integral(x**2/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin
(c*x)), x) + Integral(-2*c**2*x**4/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*
asin(c*x))*asin(c*x)), x) + Integral(c**4*x**6/(a*sqrt(a + b*asin(c*x)) + b
*sqrt(a + b*asin(c*x))*asin(c*x)), x))
```

Maxima [F]

$$\int \frac{x^2(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{(c^2dx^2-d)^2x^2}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima
")
```

```
[Out] integrate((c^2*d*x^2 - d)^2*x^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{x^2(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{(c^2dx^2-d)^2x^2}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] integrate((c^2*d*x^2 - d)^2*x^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{x^2\,(d-c^2\,d\,x^2)^2}{(a+b\,\mathrm{asin}\,(c\,x))^{3/2}}\,dx$$

```
[In] int((x^2*(d - c^2*d*x^2)^2)/(a + b*asin(c*x))^(3/2),x)
[Out] int((x^2*(d - c^2*d*x^2)^2)/(a + b*asin(c*x))^(3/2), x)
```

3.438 $\int \frac{x\left(d-c^2dx^2\right)^2}{(a+b\arcsin(cx))^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 373

$$\int \frac{x(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2} + \frac{d^2\sqrt{3\pi}\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^2} + \frac{5d^2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8b^{3/2}c^2} + \frac{5d^2\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{8b^{3/2}c^2} + \frac{d^2\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{b^{3/2}c^2} + \frac{d^2\sqrt{3\pi}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{6a}{b}\right)}{8b^{3/2}c^2}$$

```
[Out] 1/2*d^2*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1
/2))*2^(1/2)*Pi^(1/2)/b^(3/2)/c^2+1/2*d^2*FresnelS(2*2^(1/2)/Pi^(1/2)*(a+b*
arcsin(c*x))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c^2+5/8*d^2
*cos(2*a/b)*FresnelC(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/b
^(3/2)/c^2+5/8*d^2*FresnelS(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*sin
```

```
(2*a/b)*Pi^(1/2)/b^(3/2)/c^2+1/8*d^2*cos(6*a/b)*FresnelC(2*3^(1/2)/Pi^(1/2)
*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*3^(1/2)*Pi^(1/2)/b^(3/2)/c^2+1/8*d^2*Fres
nelS(2*3^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(6*a/b)*3^(1/2)
*Pi^(1/2)/b^(3/2)/c^2-2*d^2*x*(-c^2*x^2+1)^(5/2)/b/c/(a+b*arcsin(c*x))^(1/2
)
```

Rubi [A] (verified)

Time = 0.71 (sec) , antiderivative size = 373, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.370$, Rules used = {4799, 4753, 3393, 3387, 3386, 3432, 3385, 3433, 4809, 4491}

$$\int \frac{x(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{\sqrt{\frac{\pi}{2}}d^2\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2} + \frac{\sqrt{3\pi}d^2\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^2} + \frac{5\sqrt{\pi}d^2\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8b^{3/2}c^2} + \frac{5\sqrt{\pi}d^2\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8b^{3/2}c^2} + \frac{\sqrt{\frac{\pi}{2}}d^2\sin\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2} + \frac{\sqrt{3\pi}d^2\sin\left(\frac{6a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^2} - \frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}}$$

```
[In] Int[(x*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d^2*x*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) + (d^2*Sqrt[Pi
/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/
(b^(3/2)*c^2) + (d^2*Sqrt[3*Pi]*Cos[(6*a)/b]*FresnelC[(2*Sqrt[3/Pi]*Sqrt[a
+ b*ArcSin[c*x]])/Sqrt[b]])/(8*b^(3/2)*c^2) + (5*d^2*Sqrt[Pi]*Cos[(2*a)/b]*
FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])])/(8*b^(3/2)*c^2) +
 (5*d^2*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c*x]])/(Sqrt[b]*Sqrt[Pi])]*S
in[(2*a)/b])/(8*b^(3/2)*c^2) + (d^2*Sqrt[Pi/2]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[
a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/b])/(b^(3/2)*c^2) + (d^2*Sqrt[3*Pi]*
FresnelS[(2*Sqrt[3/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(6*a)/b])/(8*b
^(3/2)*c^2)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(2d^2)\int \frac{(1-c^2x^2)^{3/2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{bc} - \frac{(12cd^2)\int \frac{x^2(1-c^2x^2)^{3/2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{b}$$

$$= -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(2d^2)\,\text{Subst}\left(\int \frac{\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^2} - \frac{(12d^2)\,\text{Subst}\left(\int \frac{\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^2}$$

$$= -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(2d^2)\,\text{Subst}\left(\int \left(\frac{3}{8\sqrt{x}} + \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8\sqrt{x}} + \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\right)dx, x, a+b\arcsin(cx)\right)}{b^2c^2} - \frac{(12d^2)\,\text{Subst}\left(\int \left(\frac{1}{16\sqrt{x}} - \frac{\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)}{32\sqrt{x}} - \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{16\sqrt{x}} + \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{32\sqrt{x}}\right)dx, x, a+b\arcsin(cx)\right)}{b^2c^2}$$

$$= -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{d^2\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} + \frac{(3d^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^2} - \frac{(3d^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^2} + \frac{(3d^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} + \frac{d^2\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^2}$$

$$= -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{\left(3d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^2} + \frac{\left(d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^2} + \frac{\left(d^2\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} + \frac{\left(3d^2\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} + \frac{\left(3d^2\cos\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{6x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^2} - \frac{\left(3d^2\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^2} + \frac{\left(d^2\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c^2} + \frac{\left(d^2\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} + \frac{\left(3d^2\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^2} + \frac{\left(3d^2\sin\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{6x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c^2}$$

$$= -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{\left(3d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{4b^2c^2}$$
$$+ \frac{\left(2d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2c^2}$$
$$+ \frac{\left(d^2\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{4x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{2b^2c^2}$$
$$+ \frac{\left(3d^2\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{4x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{2b^2c^2}$$
$$+ \frac{\left(3d^2\cos\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{6x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{4b^2c^2}$$
$$- \frac{\left(3d^2\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{4b^2c^2}$$
$$+ \frac{\left(2d^2\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2c^2}$$
$$+ \frac{\left(d^2\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{4x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{2b^2c^2}$$
$$+ \frac{\left(3d^2\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{4x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{2b^2c^2}$$
$$+ \frac{\left(3d^2\sin\left(\frac{6a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{6x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{4b^2c^2}$$

$$= -\frac{2d^2x(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^2}$$
$$+ \frac{d^2\sqrt{3\pi}\cos\left(\frac{6a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8b^{3/2}c^2}$$
$$+ \frac{5d^2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8b^{3/2}c^2}$$
$$+ \frac{5d^2\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{8b^{3/2}c^2}$$
$$+ \frac{d^2\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{b^{3/2}c^2}$$
$$+ \frac{d^2\sqrt{3\pi}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{3}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{6a}{b}\right)}{8b^{3/2}c^2}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.63 (sec) , antiderivative size = 410, normalized size of antiderivative = 1.10

$$\int \frac{x(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{id^2e^{-\frac{6ia}{b}}\left(-5\sqrt{2}e^{\frac{4ia}{b}}\sqrt{-\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{1}{2},-\frac{2i(a+b\arcsin(cx))}{b}\right)+5\sqrt{2}e^{\frac{8ia}{b}}\sqrt{\frac{i(a+b\,\mathrm{ar}}{}}\right.}{}$$

```
[In] Integrate[(x*(d - c^2*d*x^2)^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] ((I/32)*d^2*(-5*Sqrt[2]*E^(((4*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*
Gamma[1/2, ((-2*I)*(a + b*ArcSin[c*x]))/b] + 5*Sqrt[2]*E^(((8*I)*a)/b)*Sqrt
[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c*x]))/b] - 8*E
^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-4*I)*(a + b
*ArcSin[c*x]))/b] + 8*E^(((10*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamm
a[1/2, ((4*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[6]*Sqrt[((-I)*(a + b*ArcSin[c*
x]))/b]*Gamma[1/2, ((-6*I)*(a + b*ArcSin[c*x]))/b] + Sqrt[6]*E^(((12*I)*a)/
b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((6*I)*(a + b*ArcSin[c*x]))/b
] + (10*I)*E^(((6*I)*a)/b)*Sin[2*ArcSin[c*x]] + (8*I)*E^(((6*I)*a)/b)*Sin[4
*ArcSin[c*x]] + (2*I)*E^(((6*I)*a)/b)*Sin[6*ArcSin[c*x]]))/(b*c^2*E^(((6*I)
*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 449, normalized size of antiderivative = 1.20

method	result
default	$\frac{d^2\left(8\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(cx)}\,\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)-8\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(cx)}\,\sin\left(\frac{4a}{b}\right)\text{FresnelS}\left(2\right.\right.}{}$

[In] int(x*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)

[Out] 1/16/c^2*d^2/b*(8*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)-8*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)+(a+b*arcsin(c*x))^(1/2)*(-6/b)^(1/2)*cos(6*a/b)*FresnelC(6*2^(1/2)/Pi^(1/2)/(-6/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*2^(1/2)-(a+b*arcsin(c*x))^(1/2)*(-6/b)^(1/2)*sin(6*a/b)*FresnelS(6*2^(1/2)/Pi^(1/2)/(-6/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)*2^(1/2)+10*(-1/b)^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*Pi^(1/2)-10*(-1/b)^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*Pi^(1/2)+5*sin(-2*(a+b*arcsin(c*x))/b+2*a/b)+4*sin(-4*(a+b*arcsin(c*x))/b+4*a/b)+sin(-6*(a+b*arcsin(c*x))/b+6*a/b))/(a+b*arcsin(c*x))^(1/2)

Fricas [F(-2)]

Exception generated.

$$\int \frac{x(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

[In] integrate(x*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

Sympy [F]

$$\int \frac{x(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = d^2\left(\int \frac{x}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx + \int \left(-\frac{2c^2x^3}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx + \int \frac{c^4x^5}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx\right)$$

```
[In] integrate(x*(-c**2*d*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
[Out] d**2*(Integral(x/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*x))*asin(c*
x)), x) + Integral(-2*c**2*x**3/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asi
n(c*x))*asin(c*x)), x) + Integral(c**4*x**5/(a*sqrt(a + b*asin(c*x)) + b*sq
rt(a + b*asin(c*x))*asin(c*x)), x))
```

Maxima [F]

$$\int \frac{x(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{(c^2dx^2-d)^2x}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
[Out] integrate((c^2*d*x^2 - d)^2*x/(b*arcsin(c*x) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{x(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{(c^2dx^2-d)^2x}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x*(-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] integrate((c^2*d*x^2 - d)^2*x/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx=\int \frac{x\,(d-c^2\,d\,x^2)^2}{(a+b\,\mathrm{asin}\,(c\,x))^{3/2}}\,dx$$

```
[In] int((x*(d - c^2*d*x^2)^2)/(a + b*asin(c*x))^(3/2),x)
[Out] int((x*(d - c^2*d*x^2)^2)/(a + b*asin(c*x))^(3/2), x)
```

3.439 $\int \frac{(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 390

$$\int \frac{(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{5d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c} - \frac{5d^2\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c} - \frac{d^2\sqrt{\frac{5\pi}{2}}\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c} + \frac{5d^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2b^{3/2}c} + \frac{5d^2\sqrt{\frac{3\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{4b^{3/2}c} + \frac{d^2\sqrt{\frac{5\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{4b^{3/2}c}$$

```
[Out] -5/4*d^2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2)
)*2^(1/2)*Pi^(1/2)/b^(3/2)/c+5/4*d^2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(
c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c-5/8*d^2*cos(3*a/b)
*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/2
```

```
)/b^(3/2)/c+5/8*d^2*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/
2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(3/2)/c-1/8*d^2*cos(5*a/b)*FresnelS(10^(1
/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*10^(1/2)*Pi^(1/2)/b^(3/2)/c+1
/8*d^2*FresnelC(10^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(5*a/
b)*10^(1/2)*Pi^(1/2)/b^(3/2)/c-2*d^2*(-c^2*x^2+1)^(5/2)/b/c/(a+b*arcsin(c*x
))^(1/2)
```

Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 390, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {4751, 4809, 4491, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{5\sqrt{\frac{\pi}{2}}d^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c} + \frac{5\sqrt{\frac{3\pi}{2}}d^2\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c} + \frac{\sqrt{\frac{5\pi}{2}}d^2\sin\left(\frac{5a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c} - \frac{5\sqrt{\frac{\pi}{2}}d^2\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c} - \frac{5\sqrt{\frac{3\pi}{2}}d^2\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c} - \frac{\sqrt{\frac{5\pi}{2}}d^2\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c} - \frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}}$$

```
[In] Int[(d - c^2*d*x^2)^2/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d^2*(1 - c^2*x^2)^(5/2))/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (5*d^2*Sqrt[Pi
/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*b^(
3/2)*c) - (5*d^2*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c) - (d^2*Sqrt[(5*Pi)/2]*Cos[(5*a)/b]*
FresnelS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(4*b^(3/2)*c) + (5
*d^2*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[
a/b])/(2*b^(3/2)*c) + (5*d^2*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b
*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(4*b^(3/2)*c) + (d^2*Sqrt[(5*Pi)/2]*F
resnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(4*b^(
3/2)*c)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
```

```
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{(10cd^2)\int \frac{x(1-c^2x^2)^{3/2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{b}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(10d^2)\,\text{Subst}\left(\int \frac{\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(10d^2)\,\text{Subst}\left(\int \left(\frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16\sqrt{x}} + \frac{3\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16\sqrt{x}} + \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{8\sqrt{x}}\right)dx, x, a+b\arcsin(cx)\right)}{b^2c}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{(5d^2)\,\text{Subst}\left(\int \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c} + \frac{(5d^2)\,\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c} + \frac{(15d^2)\,\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{\left(5d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c} - \frac{\left(15d^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c} - \frac{\left(5d^2\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c} + \frac{\left(5d^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c} + \frac{\left(15d^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c} + \frac{\left(5d^2\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{8b^2c}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{\left(5d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{2b^2c}$$
$$-\frac{\left(15d^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c}$$
$$-\frac{\left(5d^2\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{5x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c}$$
$$+\frac{\left(5d^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{2b^2c}$$
$$+\frac{\left(15d^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c}$$
$$+\frac{\left(5d^2\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{5x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4b^2c}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{5d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2b^{3/2}c}$$
$$-\frac{5d^2\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c}$$
$$-\frac{d^2\sqrt{\frac{5\pi}{2}}\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4b^{3/2}c}$$
$$+\frac{5d^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2b^{3/2}c}$$
$$+\frac{5d^2\sqrt{\frac{3\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{4b^{3/2}c}$$
$$+\frac{d^2\sqrt{\frac{5\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{4b^{3/2}c}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.74 (sec) , antiderivative size = 522, normalized size of antiderivative = 1.34

$$\int \frac{(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{d^2e^{-\frac{5i(a+b\arcsin(cx))}{b}}\left(-e^{\frac{5ia}{b}}-5e^{\frac{5ia}{b}+2i\arcsin(cx)}-10e^{\frac{5ia}{b}+4i\arcsin(cx)}-10e^{\frac{5ia}{b}+6i\arcsin\right.}{}$$

[In] Integrate[(d - c^2*d*x^2)^2/(a + b*ArcSin[c*x])^(3/2),x]

[Out] (d^2*(-E^(((5*I)*a)/b) - 5*E^(((5*I)*a)/b + (2*I)*ArcSin[c*x]) - 10*E^(((5*I)*a)/b + (4*I)*ArcSin[c*x]) - 10*E^(((5*I)*a)/b + (6*I)*ArcSin[c*x]) - 5*E^(((5*I)*a)/b + (8*I)*ArcSin[c*x]) - E^(((5*I)*(a + 2*b*ArcSin[c*x]))/b) + 10*E^(((4*I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 10*E^(((6*I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b] + 5*Sqrt[3]*E^(((2*I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] + 5*Sqrt[3]*E^(((8*I)*a)/b + (5*I)*ArcSin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c*x]))/b] + Sqrt[5]*E^((5*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] + Sqrt[5]*E^(((5*I)*(2*a + b*ArcSin[c*x]))/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((5*I)*(a + b*ArcSin[c*x]))/b]))/(16*b*c*E^(((5*I)*(a + b*ArcSin[c*x]))/b)*Sqrt[a + b*ArcSin[c*x]])

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 451, normalized size of antiderivative = 1.16

method	result
default	$-\frac{d^2\left(-5\sqrt{2}\,\sqrt{-\frac{3}{b}}\,\sqrt{a+b\arcsin(cx)}\,\cos\left(\frac{3a}{b}\right)\operatorname{FresnelS}\left(\frac{3\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{3}{b}}\,b}\right)\sqrt{\pi}-5\sqrt{2}\,\sqrt{-\frac{3}{b}}\,\sqrt{a+b\arcsin(cx)}\,\sin\left(\frac{3a}{b}\right)\operatorname{FresnelC}\left(\right.\right.}{}$

[In] int((-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)

[Out] -1/8/c*d^2/b/(a+b*arcsin(c*x))^(1/2)*(-5*2^(1/2)*(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)-5*2^(1/2)*(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*Pi^(1/2)-cos(5*a/b)*FresnelS(5*2^(1/2)/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*(-5/b)^(1/2)-sin(5*a/b)*FresnelC(5*2^(1/2)/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)*(-5/b)^(1/2)-10*2^(1/2)*(a+b*arcsin(c*

```
x))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))
^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)-10*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)
*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(
1/2)*Pi^(1/2)+10*cos(-(a+b*arcsin(c*x))/b+a/b)+5*cos(-3*(a+b*arcsin(c*x))/b
+3*a/b)+cos(-5*(a+b*arcsin(c*x))/b+5*a/b))
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx=d^2\left(\int\left(-\frac{2c^2x^2}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx+\int\frac{c^4x^4}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx+\int\frac{1}{a\sqrt{a+b\operatorname{asin}(cx)}+b\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] d**2*(Integral(-2*c**2*x**2/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a + b*asin(c*
x))*asin(c*x)), x) + Integral(c**4*x**4/(a*sqrt(a + b*asin(c*x)) + b*sqrt(a
 + b*asin(c*x))*asin(c*x)), x) + Integral(1/(a*sqrt(a + b*asin(c*x)) + b*sq
rt(a + b*asin(c*x))*asin(c*x)), x))
```

Maxima [F]

$$\int \frac{(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx=\int \frac{(c^2dx^2-d)^2}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
[Out] integrate((c^2*d*x^2 - d)^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx=\int \frac{(c^2dx^2-d)^2}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] integrate((c^2*d*x^2 - d)^2/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^2}{(a+b\arcsin(cx))^{3/2}}\,dx=\int \frac{(d-c^2\,d\,x^2)^2}{(a+b\,\mathrm{asin}(c\,x))^{3/2}}\,dx$$

```
[In] int((d - c^2*d*x^2)^2/(a + b*asin(c*x))^(3/2),x)
[Out] int((d - c^2*d*x^2)^2/(a + b*asin(c*x))^(3/2), x)
```

3.440 $\int \frac{(d-c^2dx^2)^2}{x(a+b\arcsin(cx))^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 29

$$\int \frac{(d-c^2dx^2)^2}{x(a+b\arcsin(cx))^{3/2}}\,dx = -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\arcsin(cx)}} - \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}} - \frac{3d^2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}} - \frac{3d^2\sqrt{\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}} - \frac{d^2\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{b^{3/2}} - \frac{2d^2\operatorname{Int}\left(\frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}},x\right)}{bc}$$

```
[Out] -1/2*d^2*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(
1/2))*2^(1/2)*Pi^(1/2)/b^(3/2)-1/2*d^2*FresnelS(2*2^(1/2)/Pi^(1/2)*(a+b*arc
sin(c*x))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)-3*d^2*cos(2*a/
b)*FresnelC(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/b^(3/2)-3*
d^2*FresnelS(2*(a+b*arcsin(c*x))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2
)/b^(3/2)-2*d^2*(-c^2*x^2+1)^(5/2)/b/c/x/(a+b*arcsin(c*x))^(1/2)-2*d^2*Unin
tegrable(1/x^2/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))^(1/2),x)/b/c
```

Rubi [N/A]

Not integrable

Time = 0.82 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(d-c^2dx^2)^2}{x(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{(d-c^2dx^2)^2}{x(a+b\arcsin(cx))^{3/2}}\,dx$$

```
[In] Int[(d - c^2*d*x^2)^2/(x*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] (-2*d^2*(1 - c^2*x^2)^(5/2))/(b*c*x*Sqrt[a + b*ArcSin[c*x]]) - (d^2*Sqrt[Pi
/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/
b^(3/2) - (3*d^2*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c*x]])
/(Sqrt[b]*Sqrt[Pi])])/b^(3/2) - (3*d^2*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcS
in[c*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/b^(3/2) - (d^2*Sqrt[Pi/2]*Fresn
elS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(4*a)/b])/b^(3/2) -
 (2*d^2*Defer[Int][1/(x^2*Sqrt[1 - c^2*x^2]*Sqrt[a + b*ArcSin[c*x]]), x])/(
b*c)
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\arcsin(cx)}} - \frac{(2d^2)\int \frac{(1-c^2x^2)^{3/2}}{x^2\sqrt{a+b\arcsin(cx)}}\,dx}{bc} - \frac{(8cd^2)\int \frac{(1-c^2x^2)^{3/2}}{\sqrt{a+b\arcsin(cx)}}\,dx}{b} \\
&= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\arcsin(cx)}} - \frac{(8d^2)\,\text{Subst}\left(\int \frac{\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2} \\
&\quad - \frac{(2d^2)\int \left(-\frac{2c^2}{\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}} + \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}} + \frac{c^4x^2}{\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\right)dx}{bc} \\
&= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\arcsin(cx)}} \\
&\quad - \frac{(8d^2)\,\text{Subst}\left(\int \left(\frac{3}{8\sqrt{x}} + \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{8\sqrt{x}} + \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\right)dx, x, a+b\arcsin(cx)\right)}{b^2} \\
&\quad - \frac{(2d^2)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx}{bc} + \frac{(4cd^2)\int \frac{1}{\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx}{b} \\
&\quad - \frac{(2c^3d^2)\int \frac{x^2}{\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx}{b}
\end{aligned}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\arcsin(cx)}} + \frac{2d^2\sqrt{a+b\arcsin(cx)}}{b^2} - \frac{d^2\text{Subst}\left(\int \frac{\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{(2d^2)\,\text{Subst}\left(\int \frac{\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{(4d^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{(2d^2)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx}{bc}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\arcsin(cx)}} + \frac{2d^2\sqrt{a+b\arcsin(cx)}}{b^2} - \frac{(2d^2)\,\text{Subst}\left(\int \left(\frac{1}{2\sqrt{x}} - \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{2\sqrt{x}}\right)\,dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{(2d^2)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx}{bc} - \frac{\left(4d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{\left(d^2\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{\left(4d^2\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2} - \frac{\left(d^2\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{4x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\arcsin(cx)}} + \frac{d^2\text{Subst}\left(\int \frac{\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2}$$
$$- \frac{(2d^2)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx}{bc}$$
$$- \frac{\left(8d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2}$$
$$- \frac{\left(2d^2\cos\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{4x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2}$$
$$- \frac{\left(8d^2\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{2x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2}$$
$$- \frac{\left(2d^2\sin\left(\frac{4a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{4x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\arcsin(cx)}} - \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}}$$
$$- \frac{4d^2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}}$$
$$- \frac{4d^2\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}}$$
$$- \frac{d^2\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{b^{3/2}} - \frac{(2d^2)\int \frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx}{bc}$$
$$+ \frac{\left(d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2}$$
$$+ \frac{\left(d^2\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{2x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\arcsin(cx)}} - \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}}$$
$$- \frac{4d^2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}}$$
$$- \frac{4d^2\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}}$$
$$- \frac{d^2\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{b^{3/2}} - \frac{(2d^2)\int\frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}dx}{bc}$$
$$+ \frac{\left(2d^2\cos\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2}$$
$$+ \frac{\left(2d^2\sin\left(\frac{2a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{2x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2}$$

$$= -\frac{2d^2(1-c^2x^2)^{5/2}}{bcx\sqrt{a+b\arcsin(cx)}} - \frac{d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}}$$
$$- \frac{3d^2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}}$$
$$- \frac{3d^2\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(cx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}}$$
$$- \frac{d^2\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{b^{3/2}} - \frac{(2d^2)\int\frac{1}{x^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}dx}{bc}$$

Mathematica [N/A]

Not integrable

Time = 1.26 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int \frac{(d-c^2dx^2)^2}{x(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{(d-c^2dx^2)^2}{x(a+b\arcsin(cx))^{3/2}}\,dx$$

```
[In] Integrate[(d - c^2*d*x^2)^2/(x*(a + b*ArcSin[c*x])^(3/2)),x]
[Out] Integrate[(d - c^2*d*x^2)^2/(x*(a + b*ArcSin[c*x])^(3/2)), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.27 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int \frac{\left(-c^{2} d \,x^{2}+d \right)^{2}}{x \left(a +b \arcsin \left(c x \right)\right)^{\frac{3}{2}}}d x$$

```
[In] int((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x)
```

```
[Out] int((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\left(d-c^2dx^2\right)^2}{x(a+b\arcsin(cx))^{3/2}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 5.70 (sec) , antiderivative size = 133, normalized size of antiderivative = 4.59

$$\int \frac{\left(d-c^2dx^2\right)^2}{x(a+b\arcsin(cx))^{3/2}}\,dx=d^2\left(\int \left(-\frac{2c^2x^2}{ax\sqrt{a+b\operatorname{asin}(cx)}+bx\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\right)dx + \int \frac{c^4x^4}{ax\sqrt{a+b\operatorname{asin}(cx)}+bx\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx + \int \frac{1}{ax\sqrt{a+b\operatorname{asin}(cx)}+bx\sqrt{a+b\operatorname{asin}(cx)}\operatorname{asin}(cx)}\,dx\right)$$

```
[In] integrate((-c**2*d*x**2+d)**2/x/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] d**2*(Integral(-2*c**2*x**2/(a*x*sqrt(a + b*asin(c*x)) + b*x*sqrt(a + b*asi
n(c*x))*asin(c*x)), x) + Integral(c**4*x**4/(a*x*sqrt(a + b*asin(c*x)) + b*
x*sqrt(a + b*asin(c*x))*asin(c*x)), x) + Integral(1/(a*x*sqrt(a + b*asin(c*
x)) + b*x*sqrt(a + b*asin(c*x))*asin(c*x)), x))
```

Maxima [N/A]

Not integrable

Time = 1.26 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.03

$$\int \frac{(d-c^2dx^2)^2}{x(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{(c^2dx^2-d)^2}{(b\arcsin(cx)+a)^{\frac{3}{2}}x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
[Out] integrate((c^2*d*x^2 - d)^2/((b*arcsin(c*x) + a)^(3/2)*x), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^2}{x(a+b\arcsin(cx))^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((-c^2*d*x^2+d)^2/x/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{(d-c^2dx^2)^2}{x(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{(d-c^2\,d\,x^2)^2}{x\,(a+b\,\mathrm{asin}\,(c\,x))^{3/2}}\,dx$$

```
[In] int((d - c^2*d*x^2)^2/(x*(a + b*asin(c*x))^(3/2)),x)
[Out] int((d - c^2*d*x^2)^2/(x*(a + b*asin(c*x))^(3/2)), x)
```

3.441 $\int \left(-\frac{3x}{8(1-x^2)\sqrt{\arcsin(x)}}+\frac{x\arcsin(x)^{3/2}}{(1-x^2)^2}\right)\,dx$

Optimal result

Integrand size = 38, antiderivative size = 42

$$\int \left(-\frac{3x}{8(1-x^2)\sqrt{\arcsin(x)}}+\frac{x\arcsin(x)^{3/2}}{(1-x^2)^2}\right)\,dx=-\frac{3x\sqrt{\arcsin(x)}}{4\sqrt{1-x^2}}+\frac{\arcsin(x)^{3/2}}{2(1-x^2)}$$

```
[Out] 1/2*arcsin(x)^(3/2)/(-x^2+1)-3/4*x*arcsin(x)^(1/2)/(-x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {4767, 4745}

$$\int \left(-\frac{3x}{8(1-x^2)\sqrt{\arcsin(x)}}+\frac{x\arcsin(x)^{3/2}}{(1-x^2)^2}\right)\,dx=\frac{\arcsin(x)^{3/2}}{2(1-x^2)}-\frac{3x\sqrt{\arcsin(x)}}{4\sqrt{1-x^2}}$$

```
[In] Int[(-3*x)/(8*(1 - x^2)*Sqrt[ArcSin[x]]) + (x*ArcSin[x]^(3/2))/(1 - x^2)^2,
x]
```

```
[Out] (-3*x*Sqrt[ArcSin[x]])/(4*Sqrt[1 - x^2]) + ArcSin[x]^(3/2)/(2*(1 - x^2))
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
```

```
+ e, 0] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\left(\frac{3}{8}\int \frac{x}{(1-x^2)\sqrt{\arcsin(x)}}\,dx\right) + \int \frac{x\arcsin(x)^{3/2}}{(1-x^2)^2}\,dx \\
&= \frac{\arcsin(x)^{3/2}}{2(1-x^2)} - \frac{3}{8}\int \frac{x}{(1-x^2)\sqrt{\arcsin(x)}}\,dx - \frac{3}{4}\int \frac{\sqrt{\arcsin(x)}}{(1-x^2)^{3/2}}\,dx \\
&= -\frac{3x\sqrt{\arcsin(x)}}{4\sqrt{1-x^2}} + \frac{\arcsin(x)^{3/2}}{2(1-x^2)}
\end{aligned}
$$

Mathematica [F]

$$
\int \left(-\frac{3x}{8(1-x^2)\sqrt{\arcsin(x)}} + \frac{x\arcsin(x)^{3/2}}{(1-x^2)^2}\right) dx = \int \left(-\frac{3x}{8(1-x^2)\sqrt{\arcsin(x)}} + \frac{x\arcsin(x)^{3/2}}{(1-x^2)^2}\right) dx
$$

```
[In] Integrate[(-3*x)/(8*(1 - x^2)*Sqrt[ArcSin[x]]) + (x*ArcSin[x]^(3/2))/(1 - x
^2)^2,x]
```

```
[Out] Integrate[(-3*x)/(8*(1 - x^2)*Sqrt[ArcSin[x]]) + (x*ArcSin[x]^(3/2))/(1 - x
^2)^2, x]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.38 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.12

method	result	size
default	$\frac{3 i \sqrt{\arcsin \left(x \right)}}{4}-\frac{\left(3 i x^{2}-3 \sqrt{-x^{2}+1}\, x +2 \arcsin \left(x \right)-3 i\right) \sqrt{\arcsin \left(x \right)}}{4 \left(x^{2}-1\right)}$	47
parts	$\frac{3 i \sqrt{\arcsin \left(x \right)}}{4}-\frac{\left(3 i x^{2}-3 \sqrt{-x^{2}+1}\, x +2 \arcsin \left(x \right)-3 i\right) \sqrt{\arcsin \left(x \right)}}{4 \left(x^{2}-1\right)}$	47

```
[In] int(x*arcsin(x)^(3/2)/(-x^2+1)^2-3/8*x/(-x^2+1)/arcsin(x)^(1/2),x,method=_R
ETURNVERBOSE)
```

```
[Out] 3/4*I*arcsin(x)^(1/2)-1/4*(3*I*x^2-3*(-x^2+1)^(1/2)*x+2*arcsin(x)-3*I)*arcs
in(x)^(1/2)/(x^2-1)
```

Fricas [F(-2)]

Exception generated.

$$\int \left(-\frac{3x}{8\left(1-x^{2}\right)\sqrt{\arcsin(x)}}+\frac{x\arcsin(x)^{3/2}}{\left(1-x^{2}\right)^{2}}\right)dx=\text{Exception raised: TypeError}$$

```
[In] integrate(x*arcsin(x)^(3/2)/(-x^2+1)^2-3/8*x/(-x^2+1)/arcsin(x)^(1/2),x, al
gorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \left(-\frac{3x}{8\left(1-x^{2}\right)\sqrt{\arcsin(x)}}+\frac{x\arcsin(x)^{3/2}}{\left(1-x^{2}\right)^{2}}\right)dx=\frac{\int \left(-\frac{3x}{x^{4}\sqrt{\operatorname{asin}(x)}-2x^{2}\sqrt{\operatorname{asin}(x)}+\sqrt{\operatorname{asin}(x)}}\right)dx+\int \frac{3x^{3}}{x^{4}\sqrt{\operatorname{asin}(x)}-2x^{2}\sqrt{\operatorname{asin}(x)}+\sqrt{\operatorname{asin}(x)}}\,dx+\int \frac{}{x^{4}}}{8}$$

```
[In] integrate(x*asin(x)**(3/2)/(-x**2+1)**2-3/8*x/(-x**2+1)/asin(x)**(1/2),x)
```

```
[Out] (Integral(-3*x/(x**4*sqrt(asin(x)) - 2*x**2*sqrt(asin(x)) + sqrt(asin(x))),
 x) + Integral(3*x**3/(x**4*sqrt(asin(x)) - 2*x**2*sqrt(asin(x)) + sqrt(asi
n(x))), x) + Integral(8*x*asin(x)**2/(x**4*sqrt(asin(x)) - 2*x**2*sqrt(asin
(x)) + sqrt(asin(x))), x))/8
```

Maxima [F(-2)]

Exception generated.

$$\int \left(-\frac{3x}{8\left(1-x^2\right)\sqrt{\arcsin(x)}}+\frac{x\arcsin(x)^{3/2}}{\left(1-x^2\right)^2}\right)dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(x*arcsin(x)^(3/2)/(-x^2+1)^2-3/8*x/(-x^2+1)/arcsin(x)^(1/2),x, al
gorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [A] (verification not implemented)

none

Time = 0.44 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.10

$$\int \left(-\frac{3x}{8\left(1-x^2\right)\sqrt{\arcsin(x)}}+\frac{x\arcsin(x)^{3/2}}{\left(1-x^2\right)^2}\right)dx = -\frac{x^2\arcsin\left(x\right)^{\frac{3}{2}}}{2\left(x^2-1\right)}+\frac{1}{2}\arcsin\left(x\right)^{\frac{3}{2}}+\frac{3\sqrt{-x^2+1}x\sqrt{\arcsin\left(x\right)}}{4\left(x^2-1\right)}$$

```
[In] integrate(x*arcsin(x)^(3/2)/(-x^2+1)^2-3/8*x/(-x^2+1)/arcsin(x)^(1/2),x, al
gorithm="giac")
```

```
[Out] -1/2*x^2*arcsin(x)^(3/2)/(x^2 - 1) + 1/2*arcsin(x)^(3/2) + 3/4*sqrt(-x^2 +
1)*x*sqrt(arcsin(x))/(x^2 - 1)
```

Mupad [F(-1)]

Timed out.

$$\int \left(-\frac{3x}{8\left(1-x^2\right)\sqrt{\arcsin(x)}}+\frac{x\arcsin(x)^{3/2}}{\left(1-x^2\right)^2}\right)dx = \int \frac{3\,x}{8\,\sqrt{\mathrm{asin}\left(x\right)}\,\left(x^2-1\right)}+\frac{x\,{\mathrm{asin}\left(x\right)}^{3/2}}{{\left(x^2-1\right)}^2}\,dx$$

```
[In] int((3*x)/(8*asin(x)^(1/2)*(x^2 - 1)) + (x*asin(x)^(3/2))/(x^2 - 1)^2,x)
```

```
[Out] int((3*x)/(8*asin(x)^(1/2)*(x^2 - 1)) + (x*asin(x)^(3/2))/(x^2 - 1)^2, x)
```

3.442 $\int (c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 227

$$\int (c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}\,dx = \frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{1}{4}x(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)} + \frac{c\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{4a\sqrt{1-a^2x^2}} - \frac{c\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{64a\sqrt{1-a^2x^2}} - \frac{c\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}$$

```
[Out] 1/4*c*arcsin(a*x)^(3/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-1/128*c*F
resnelS(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(-a^2*c*x^2+
c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-1/8*c*FresnelS(2*arcsin(a*x)^(1/2)/Pi^(1/2))*
Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+1/4*x*(-a^2*c*x^2+c)^(3/
2)*arcsin(a*x)^(1/2)+3/8*c*x*(-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used

$= \{4743, 4741, 4737, 4731, 4491, 12, 3386, 3432, 4809\}$

$$\int \left(c-a^2cx^2\right)^{3/2}\sqrt{\arcsin(ax)}\,dx = -\frac{\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{64a\sqrt{1-a^2x^2}} - \frac{\sqrt{\pi}c\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}} + \frac{1}{4}x\sqrt{\arcsin(ax)}\left(c-a^2cx^2\right)^{3/2} + \frac{c\arcsin(ax)^{3/2}\sqrt{c-a^2cx^2}}{4a\sqrt{1-a^2x^2}} + \frac{3}{8}cx\sqrt{\arcsin(ax)}\sqrt{c-a^2cx^2}$$

```
[In] Int[(c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]],x]
```

```
[Out] (3*c*x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/8 + (x*(c - a^2*c*x^2)^(3/2)*
Sqrt[ArcSin[a*x]])/4 + (c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))/(4*a*Sqrt[
1 - a^2*x^2]) - (c*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqr
t[ArcSin[a*x]]])/(64*a*Sqrt[1 - a^2*x^2]) - (c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]
*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(8*a*Sqrt[1 - a^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\arcsin(ax)} \\
&\quad+\frac{1}{4}(3c)\int\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}\,dx-\frac{\left(ac\sqrt{c-a^2cx^2}\right)\int\frac{x(1-a^2x^2)}{\sqrt{\arcsin(ax)}}\,dx}{8\sqrt{1-a^2x^2}}
\end{aligned}
$$

$$= \frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\arcsin(ax)} + \frac{\left(3c\sqrt{c-a^2cx^2}\right)\int \frac{\sqrt{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx}{8\sqrt{1-a^2x^2}} - \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos^3(x)\sin(x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{8a\sqrt{1-a^2x^2}} - \frac{\left(3ac\sqrt{c-a^2cx^2}\right)\int \frac{x}{\sqrt{\arcsin(ax)}}\,dx}{16\sqrt{1-a^2x^2}}$$

$$= \frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\arcsin(ax)} + \frac{c\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{4a\sqrt{1-a^2x^2}} - \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \left(\frac{\sin(2x)}{4\sqrt{x}} + \frac{\sin(4x)}{8\sqrt{x}}\right)dx, x, \arcsin(ax)\right)}{8a\sqrt{1-a^2x^2}} - \frac{\left(3c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{16a\sqrt{1-a^2x^2}}$$

$$= \frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\arcsin(ax)} + \frac{c\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{4a\sqrt{1-a^2x^2}} - \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\sin(4x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{64a\sqrt{1-a^2x^2}} - \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{32a\sqrt{1-a^2x^2}} - \frac{\left(3c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\sin(2x)}{2\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{16a\sqrt{1-a^2x^2}}$$

$$= \frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\arcsin(ax)} + \frac{c\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{4a\sqrt{1-a^2x^2}} - \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \sin\left(4x^2\right)dx, x, \sqrt{\arcsin(ax)}\right)}{32a\sqrt{1-a^2x^2}} - \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \sin\left(2x^2\right)dx, x, \sqrt{\arcsin(ax)}\right)}{16a\sqrt{1-a^2x^2}} - \frac{\left(3c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{32a\sqrt{1-a^2x^2}}$$

$$= \frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\arcsin(ax)} + \frac{c\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{4a\sqrt{1-a^2x^2}} - \frac{c\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{64a\sqrt{1-a^2x^2}} - \frac{c\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}} - \frac{\left(3c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\sin\left(2x^2\right)\,dx, x, \sqrt{\arcsin(ax)}\right)}{16a\sqrt{1-a^2x^2}}$$

$$= \frac{3}{8}cx\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\sqrt{\arcsin(ax)} + \frac{c\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{4a\sqrt{1-a^2x^2}} - \frac{c\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{64a\sqrt{1-a^2x^2}} - \frac{c\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.20 (sec) , antiderivative size = 166, normalized size of antiderivative = 0.73

$$\int \left(c - a^2cx^2\right)^{3/2}\sqrt{\arcsin(ax)}\,dx = \frac{c\sqrt{c-a^2cx^2}\left(32\arcsin(ax)^2 + 8\sqrt{2}\sqrt{-i\arcsin(ax)}\,\Gamma\left(\frac{3}{2}, -2i\arcsin(ax)\right) + 8\sqrt{}\right.}{}$$

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]],x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(32*ArcSin[a*x]^2 + 8*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]
*Gamma[3/2, (-2*I)*ArcSin[a*x]] + 8*Sqrt[2]*Sqrt[I*ArcSin[a*x]]*Gamma[3/2,
(2*I)*ArcSin[a*x]] + Sqrt[(-I)*ArcSin[a*x]]*Gamma[3/2, (-4*I)*ArcSin[a*x]]
+ Sqrt[I*ArcSin[a*x]]*Gamma[3/2, (4*I)*ArcSin[a*x]]))/(128*a*Sqrt[1 - a^2*x
^2]*Sqrt[ArcSin[a*x]])
```

Maple [F]

$$\int \left(-a^2c\,x^2 + c\right)^{\frac{3}{2}}\sqrt{\arcsin\left(ax\right)}dx$$

```
[In] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \left(c - a^2 c x^2\right)^{3/2} \sqrt{\arcsin(ax)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \left(c - a^2 c x^2\right)^{3/2} \sqrt{\arcsin(ax)}\,dx = \int \left(-c(ax-1)\,(ax+1)\right)^{\frac{3}{2}} \sqrt{\operatorname{asin}\,(ax)}\,dx$$

```
[In] integrate((-a**2*c*x**2+c)**(3/2)*asin(a*x)**(1/2),x)
```

```
[Out] Integral((-c*(a*x - 1)*(a*x + 1))**(3/2)*sqrt(asin(a*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \left(c - a^2 c x^2\right)^{3/2} \sqrt{\arcsin(ax)}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F(-2)]

Exception generated.

$$\int \left(c - a^2 c x^2\right)^{3/2} \sqrt{\arcsin(ax)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \left(c-a^2cx^2\right)^{3/2}\sqrt{\arcsin(ax)}\,dx=\int \sqrt{\mathrm{asin}\left(a\,x\right)}\,{\left(c-a^2\,c\,x^2\right)}^{3/2}\,dx$$

```
[In] int(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(3/2),x)
[Out] int(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(3/2), x)
```

3.443 $\int \sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 130

$$\int \sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}\,dx = \frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{3a\sqrt{1-a^2x^2}} - \frac{\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}$$

```
[Out] 1/3*arcsin(a*x)^(3/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-1/8*Fresnel
S(2*arcsin(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1
)^(1/2)+1/2*x*(-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4741, 4737, 4731, 4491, 12, 3386, 3432}

$$\int \sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}\,dx = -\frac{\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}} + \frac{\arcsin(ax)^{3/2}\sqrt{c-a^2cx^2}}{3a\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{\arcsin(ax)}\sqrt{c-a^2cx^2}$$

```
[In] Int[Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]],x]
```

```
[Out] (x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a
*x]^(3/2))/(3*a*Sqrt[1 - a^2*x^2]) - (Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS
[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(8*a*Sqrt[1 - a^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{\sqrt{c-a^2cx^2}\int \frac{\sqrt{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx}{2\sqrt{1-a^2x^2}} \\
&\quad - \frac{\left(a\sqrt{c-a^2cx^2}\right)\int \frac{x}{\sqrt{\arcsin(ax)}}\,dx}{4\sqrt{1-a^2x^2}} \\
&= \frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{3a\sqrt{1-a^2x^2}} \\
&\quad - \frac{\sqrt{c-a^2cx^2}\,\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{4a\sqrt{1-a^2x^2}} \\
&= \frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{3a\sqrt{1-a^2x^2}} \\
&\quad - \frac{\sqrt{c-a^2cx^2}\,\text{Subst}\left(\int \frac{\sin(2x)}{2\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{4a\sqrt{1-a^2x^2}} \\
&= \frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{3a\sqrt{1-a^2x^2}} \\
&\quad - \frac{\sqrt{c-a^2cx^2}\,\text{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{8a\sqrt{1-a^2x^2}} \\
&= \frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{3a\sqrt{1-a^2x^2}} \\
&\quad - \frac{\sqrt{c-a^2cx^2}\,\text{Subst}\left(\int \sin\left(2x^2\right)\,dx, x, \sqrt{\arcsin(ax)}\right)}{4a\sqrt{1-a^2x^2}} \\
&= \frac{1}{2}x\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{3a\sqrt{1-a^2x^2}} \\
&\quad - \frac{\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.05 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.06

$$\int \sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}\,dx = \frac{\sqrt{c-a^2cx^2}\left(16\arcsin(ax)\left(3ax\sqrt{1-a^2x^2}+2\arcsin(ax)\right)+3\sqrt{2}\sqrt{-i\arcsin(ax)}\Gamma\left(\frac{1}{2},-2i\arcsin(ax)\right)+\right.}{96a\sqrt{1-a^2x^2}\sqrt{\arcsin(ax)}}$$

```
[In] Integrate[Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]],x]
[Out] (Sqrt[c - a^2*c*x^2]*(16*ArcSin[a*x]*(3*a*x*Sqrt[1 - a^2*x^2] + 2*ArcSin[a*
x]) + 3*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (-2*I)*ArcSin[a*x]] + 3*S
qrt[2]*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (2*I)*ArcSin[a*x]]))/(96*a*Sqrt[1 - a
^2*x^2]*Sqrt[ArcSin[a*x]])
```

Maple [F]

$$\int \sqrt{-a^2c\,x^2+c}\,\sqrt{\arcsin\left(ax\right)}dx$$

```
[In] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x)
[Out] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}\,dx = \int \sqrt{-c\,(ax-1)\,(ax+1)}\sqrt{\operatorname{asin}\,(ax)}\,dx$$

```
[In] integrate((-a**2*c*x**2+c)**(1/2)*asin(a*x)**(1/2),x)
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))*sqrt(asin(a*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F(-2)]

Exception generated.

$$\int \sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}\,dx = \int \sqrt{\operatorname{asin}\,(a\,x)}\,\sqrt{c-a^2\,c\,x^2}\,dx$$

```
[In] int(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(1/2),x)
[Out] int(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(1/2), x)
```

3.444 $\int \frac{\sqrt{\arcsin(ax)}}{\sqrt{c-a^2cx^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 44

$$\int \frac{\sqrt{\arcsin(ax)}}{\sqrt{c-a^2cx^2}}\,dx = \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^{3/2}}{3a\sqrt{c-a^2cx^2}}$$

```
[Out] 2/3*arcsin(a*x)^(3/2)*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.042$, Rules used = {4737}

$$\int \frac{\sqrt{\arcsin(ax)}}{\sqrt{c-a^2cx^2}}\,dx = \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^{3/2}}{3a\sqrt{c-a^2cx^2}}$$

```
[In] Int[Sqrt[ArcSin[a*x]]/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(3/2))/(3*a*Sqrt[c - a^2*c*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral} = \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^{3/2}}{3a\sqrt{c-a^2cx^2}}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{\arcsin(ax)}}{\sqrt{c-a^2cx^2}}\,dx = \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^{3/2}}{3a\sqrt{c-a^2cx^2}}$$

```
[In] Integrate[Sqrt[ArcSin[a*x]]/Sqrt[c - a^2*c*x^2],x]
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(3/2))/(3*a*Sqrt[c - a^2*c*x^2])
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.86

method	result	size
default	$\frac{2\arcsin(ax)^{\frac{3}{2}}\sqrt{-a^2x^2+1}}{3a\sqrt{-c(a^2x^2-1)}}$	38

```
[In] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/3*arcsin(a*x)^(3/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\sqrt{\arcsin(ax)}}{\sqrt{c-a^2cx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{\sqrt{\arcsin(ax)}}{\sqrt{c-a^2cx^2}}\,dx = \int \frac{\sqrt{\operatorname{asin}(ax)}}{\sqrt{-c(ax-1)(ax+1)}}\,dx$$

```
[In] integrate(asin(a*x)**(1/2)/(-a**2*c*x**2+c)**(1/2),x)
[Out] Integral(sqrt(asin(a*x))/sqrt(-c*(a*x - 1)*(a*x + 1)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{\arcsin(ax)}}{\sqrt{c-a^2cx^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{\sqrt{\arcsin(ax)}}{\sqrt{c-a^2cx^2}}\,dx = \int \frac{\sqrt{\arcsin(ax)}}{\sqrt{-a^2cx^2+c}}\,dx$$

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(arcsin(a*x))/sqrt(-a^2*c*x^2 + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\arcsin(ax)}}{\sqrt{c-a^2cx^2}}\,dx = \int \frac{\sqrt{\mathrm{asin}(a\,x)}}{\sqrt{c-a^2\,c\,x^2}}\,dx$$

```
[In] int(asin(a*x)^(1/2)/(c - a^2*c*x^2)^(1/2),x)
[Out] int(asin(a*x)^(1/2)/(c - a^2*c*x^2)^(1/2), x)
```

3.445 $\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{3/2}}\,dx = \frac{x\sqrt{\arcsin(ax)}}{c\sqrt{c-a^2cx^2}} - \frac{a\sqrt{1-a^2x^2}\text{Int}\left(\frac{x}{(1-a^2x^2)\sqrt{\arcsin(ax)}},x\right)}{2c\sqrt{c-a^2cx^2}}$$

```
[Out] x*arcsin(a*x)^(1/2)/c/(-a^2*c*x^2+c)^(1/2)-1/2*a*(-a^2*x^2+1)^(1/2)*Uninteg
rable(x/(-a^2*x^2+1)/arcsin(a*x)^(1/2),x)/c/(-a^2*c*x^2+c)^(1/2)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{3/2}}\,dx$$

```
[In] Int[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*Sqrt[ArcSin[a*x]])/(c*Sqrt[c - a^2*c*x^2]) - (a*Sqrt[1 - a^2*x^2]*Defer[
Int][x/((1 - a^2*x^2)*Sqrt[ArcSin[a*x]]), x])/(2*c*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\text{integral} = \frac{x\sqrt{\arcsin(ax)}}{c\sqrt{c-a^2cx^2}} - \frac{\left(a\sqrt{1-a^2x^2}\right)\int \frac{x}{(1-a^2x^2)\sqrt{\arcsin(ax)}}\,dx}{2c\sqrt{c-a^2cx^2}}$$

Mathematica [N/A]

Not integrable

Time = 1.84 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{3/2}}\,dx=\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{3/2}}\,dx$$

```
[In] Integrate[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(3/2),x]
[Out] Integrate[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(3/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.25 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int \frac{\sqrt{\arcsin(ax)}}{(-a^2c\,x^2+c)^{\frac{3}{2}}}dx$$

```
[In] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x)
[Out] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{3/2}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 2.60 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{3/2}}\,dx=\int \frac{\sqrt{\operatorname{asin}(ax)}}{(-c\,(ax-1)\,(ax+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(asin(a*x)**(1/2)/(-a**2*c*x**2+c)**(3/2),x)
[Out] Integral(sqrt(asin(a*x))/(-c*(a*x - 1)*(a*x + 1))**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.66 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\sqrt{\arcsin(ax)}}{(-a^2cx^2+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] integrate(sqrt(arcsin(a*x))/(-a^2*c*x^2 + c)^(3/2), x)
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\sqrt{\mathrm{asin}(a\,x)}}{(c-a^2\,c\,x^2)^{3/2}}\,dx$$

```
[In] int(asin(a*x)^(1/2)/(c - a^2*c*x^2)^(3/2),x)
[Out] int(asin(a*x)^(1/2)/(c - a^2*c*x^2)^(3/2), x)
```

3.446 $\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{5/2}} \, dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{5/2}} \, dx = \frac{x\sqrt{\arcsin(ax)}}{3c(c-a^2cx^2)^{3/2}} + \frac{2x\sqrt{\arcsin(ax)}}{3c^2\sqrt{c-a^2cx^2}} - \frac{a\sqrt{1-a^2x^2}\text{Int}\left(\frac{x}{(1-a^2x^2)^2\sqrt{\arcsin(ax)}}, x\right)}{6c^2\sqrt{c-a^2cx^2}} - \frac{a\sqrt{1-a^2x^2}\text{Int}\left(\frac{x}{(1-a^2x^2)\sqrt{\arcsin(ax)}}, x\right)}{3c^2\sqrt{c-a^2cx^2}}$$

```
[Out] 1/3*x*arcsin(a*x)^(1/2)/c/(-a^2*c*x^2+c)^(3/2)+2/3*x*arcsin(a*x)^(1/2)/c^2/
(-a^2*c*x^2+c)^(1/2)-1/6*a*(-a^2*x^2+1)^(1/2)*Unintegrable(x/(-a^2*x^2+1)^2
/arcsin(a*x)^(1/2),x)/c^2/(-a^2*c*x^2+c)^(1/2)-1/3*a*(-a^2*x^2+1)^(1/2)*Uni
ntegrable(x/(-a^2*x^2+1)/arcsin(a*x)^(1/2),x)/c^2/(-a^2*c*x^2+c)^(1/2)
```

Rubi [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{5/2}} \, dx = \int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{5/2}} \, dx$$

```
[In] Int[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(5/2),x]
```

```
[Out] (x*Sqrt[ArcSin[a*x]])/(3*c*(c - a^2*c*x^2)^(3/2)) + (2*x*Sqrt[ArcSin[a*x]])
/(3*c^2*Sqrt[c - a^2*c*x^2]) - (a*Sqrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*
x^2)^2*Sqrt[ArcSin[a*x]]), x])/(6*c^2*Sqrt[c - a^2*c*x^2]) - (a*Sqrt[1 - a^
```

```
2*x^2]*Defer[Int][x/((1 - a^2*x^2)*Sqrt[ArcSin[a*x]]), x])/(3*c^2*Sqrt[c -
a^2*c*x^2])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x\sqrt{\arcsin(ax)}}{3c\left(c-a^2cx^2\right)^{3/2}}+\frac{2\int\frac{\sqrt{\arcsin(ax)}}{\left(c-a^2cx^2\right)^{3/2}}\,dx}{3c}-\frac{\left(a\sqrt{1-a^2x^2}\right)\int\frac{x}{\left(1-a^2x^2\right)^2\sqrt{\arcsin(ax)}}\,dx}{6c^2\sqrt{c-a^2cx^2}}\\
&= \frac{x\sqrt{\arcsin(ax)}}{3c\left(c-a^2cx^2\right)^{3/2}}+\frac{2x\sqrt{\arcsin(ax)}}{3c^2\sqrt{c-a^2cx^2}}-\frac{\left(a\sqrt{1-a^2x^2}\right)\int\frac{x}{\left(1-a^2x^2\right)^2\sqrt{\arcsin(ax)}}\,dx}{6c^2\sqrt{c-a^2cx^2}}\\
&\quad-\frac{\left(a\sqrt{1-a^2x^2}\right)\int\frac{x}{\left(1-a^2x^2\right)\sqrt{\arcsin(ax)}}\,dx}{3c^2\sqrt{c-a^2cx^2}}
\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 2.58 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int\frac{\sqrt{\arcsin(ax)}}{\left(c-a^2cx^2\right)^{5/2}}\,dx=\int\frac{\sqrt{\arcsin(ax)}}{\left(c-a^2cx^2\right)^{5/2}}\,dx$$

```
[In] Integrate[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(5/2),x]
[Out] Integrate[Sqrt[ArcSin[a*x]]/(c - a^2*c*x^2)^(5/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.28 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int\frac{\sqrt{\arcsin\left(ax\right)}}{\left(-a^2c\,x^2+c\right)^{\frac{5}{2}}}dx$$

```
[In] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x)
[Out] int(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 22.75 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{5/2}}\,dx = \int \frac{\sqrt{\operatorname{asin}(ax)}}{(-c(ax-1)(ax+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate(asin(a*x)**(1/2)/(-a**2*c*x**2+c)**(5/2),x)
[Out] Integral(sqrt(asin(a*x))/(-c*(a*x - 1)*(a*x + 1))**(5/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{5/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.71 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{5/2}}\,dx = \int \frac{\sqrt{\arcsin{(ax)}}}{(-a^2cx^2+c)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^(1/2)/(-a^2*c*x^2+c)^(5/2),x, algorithm="giac")
[Out] integrate(sqrt(arcsin(a*x))/(-a^2*c*x^2 + c)^(5/2), x)
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt{\arcsin(ax)}}{(c-a^2cx^2)^{5/2}}\,dx = \int \frac{\sqrt{\mathrm{asin}\left(a\,x\right)}}{{\left(c-a^2\,c\,x^2\right)}^{5/2}}\,dx$$

```
[In] int(asin(a*x)^(1/2)/(c - a^2*c*x^2)^(5/2),x)
[Out] int(asin(a*x)^(1/2)/(c - a^2*c*x^2)^(5/2), x)
```

3.447 $\int (c-a^2cx^2)^{3/2} \arcsin(ax)^{3/2} dx$

Optimal result

Integrand size = 24, antiderivative size = 363

$$\int (c-a^2cx^2)^{3/2} \arcsin(ax)^{3/2} dx = \frac{27c\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{256a\sqrt{1-a^2x^2}}$$
$$-\frac{9acx^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32\sqrt{1-a^2x^2}}+\frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32a}$$
$$+\frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}+\frac{1}{4}x(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}+\frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}{20a\sqrt{1-a^2x^2}}-\frac{3c\sqrt{\frac{\pi}{2}}\sqrt{c-a}}{}$$

```
[Out] 1/4*x*(-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2)+3/8*c*x*arcsin(a*x)^(3/2)*(-a^
2*c*x^2+c)^(1/2)+3/20*c*arcsin(a*x)^(5/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+
1)^(1/2)-3/1024*c*FresnelC(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi
^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-3/32*c*FresnelC(2*arcsin(a
*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+3/32
*c*(-a^2*x^2+1)^(3/2)*(-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)/a+27/256*c*(-a
^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)/a/(-a^2*x^2+1)^(1/2)-9/32*a*c*x^2*(-a^2
*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)/(-a^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 363, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules

used = {4743, 4741, 4737, 4725, 4809, 3393, 3385, 3433, 4767, 4753}

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{3/2}\,dx = -\frac{3\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{512a\sqrt{1-a^2x^2}}$$
$$-\frac{3\sqrt{\pi}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}}+\frac{3c\arcsin(ax)^{5/2}\sqrt{c-a^2cx^2}}{20a\sqrt{1-a^2x^2}}$$
$$+\frac{1}{4}x\arcsin(ax)^{3/2}\left(c-a^2cx^2\right)^{3/2}+\frac{3}{8}cx\arcsin(ax)^{3/2}\sqrt{c-a^2cx^2}+\frac{3c(1-a^2x^2)^{3/2}\sqrt{\arcsin(ax)}\sqrt{c-a^2cx^2}}{32a}-\frac{9}{}$$

```
[In] Int[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2),x]
```

```
[Out] (27*c*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(256*a*Sqrt[1 - a^2*x^2]) - (9
*a*c*x^2*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(32*Sqrt[1 - a^2*x^2]) + (3
*c*(1 - a^2*x^2)^(3/2)*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(32*a) + (3*c
*x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))/8 + (x*(c - a^2*c*x^2)^(3/2)*ArcS
in[a*x]^(3/2))/4 + (3*c*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2))/(20*a*Sqrt[1
 - a^2*x^2]) - (3*c*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sq
rt[ArcSin[a*x]]])/(512*a*Sqrt[1 - a^2*x^2]) - (3*c*Sqrt[Pi]*Sqrt[c - a^2*c*
x^2]*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(32*a*Sqrt[1 - a^2*x^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{3/2} + \frac{1}{4}(3c)\int \sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}\,dx - \frac{\left(3ac\sqrt{c-a^2cx^2}\right)\int x(1-a^2x^2)\sqrt{\arcsin(ax)}\,dx}{8\sqrt{1-a^2x^2}}$$

$$= \frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32a} + \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{3/2} - \frac{\left(3c\sqrt{c-a^2cx^2}\right)\int \frac{(1-a^2x^2)^{3/2}}{\sqrt{\arcsin(ax)}}\,dx}{64\sqrt{1-a^2x^2}} + \frac{\left(3c\sqrt{c-a^2cx^2}\right)\int \frac{\arcsin(ax)^{3/2}}{\sqrt{1-a^2x^2}}\,d}{8\sqrt{1-a^2x^2}}$$

$$= -\frac{9acx^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32\sqrt{1-a^2x^2}} + \frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32a} + \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{3/2} + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}{20a\sqrt{1-a^2x^2}} - \frac{\left(3c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos^4(x)}{\sqrt{x}}\,dx\right.}{64a\sqrt{1-a^2x^2}}$$

$$= -\frac{9acx^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32\sqrt{1-a^2x^2}} + \frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32a} + \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{3/2} + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}{20a\sqrt{1-a^2x^2}} - \frac{\left(3c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \left(\frac{3}{8\sqrt{x}} + \right.\right.}{64a\sqrt{1}}$$

$$= -\frac{9c\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{256a\sqrt{1-a^2x^2}} - \frac{9acx^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32\sqrt{1-a^2x^2}} + \frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32a} + \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{3/2} + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}{20a\sqrt{1-a^2x^2}} - \frac{\left(3c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos(4x)}{\sqrt{x}}\,dx\right.}{512a\sqrt{1-a^2x^2}}$$

$$= \frac{27c\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{256a\sqrt{1-a^2x^2}} - \frac{9acx^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32\sqrt{1-a^2x^2}} + \frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32a} + \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{3/2} + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}{20a\sqrt{1-a^2x^2}} - \frac{\left(3c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \cos\left(4x^2\right)\right.}{256a\sqrt{1-a^2x}}$$

$$= \frac{27c\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{256a\sqrt{1-a^2x^2}} - \frac{9acx^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32\sqrt{1-a^2x^2}} + \frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32a} + \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{1}{4}x(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2} + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}{20a\sqrt{1-a^2x^2}} - \frac{3c\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\right.}{512a\sqrt{1-a^2x^2}}$$

$$= \frac{27c\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{256a\sqrt{1-a^2x^2}} - \frac{9acx^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32\sqrt{1-a^2x^2}} + \frac{3c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{32a} + \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{1}{4}x(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2} + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}{20a\sqrt{1-a^2x^2}} - \frac{3c\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\right.}{512a\sqrt{1-a^2x^2}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.43 (sec) , antiderivative size = 186, normalized size of antiderivative = 0.51

$$\int (c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}\,dx = \frac{c\sqrt{c-a^2cx^2}\left(-240\sqrt{\pi}\sqrt{\arcsin(ax)^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right) + \sqrt{\arcsin(ax)}\left(\right.\right.}{}$$

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2),x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(-240*Sqrt[Pi]*Sqrt[ArcSin[a*x]^2]*FresnelC[(2*Sqrt[
ArcSin[a*x]])/Sqrt[Pi]] + Sqrt[ArcSin[a*x]]*(5*Sqrt[I*ArcSin[a*x]]*Gamma[5/
2, (-4*I)*ArcSin[a*x]] + 5*Sqrt[(-I)*ArcSin[a*x]]*Gamma[5/2, (4*I)*ArcSin[a
*x]] + 32*Sqrt[ArcSin[a*x]^2]*(12*ArcSin[a*x]^2 + 15*Cos[2*ArcSin[a*x]] + 2
0*ArcSin[a*x]*Sin[2*ArcSin[a*x]]))))/(2560*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[
a*x]^2])
```

Maple [F]

$$\int \left(-a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arcsin \left(a x \right)^{\frac{3}{2}}d x$$

```
[In] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x)
[Out] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{3/2}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{3/2}\,dx=\text{Timed out}$$

```
[In] integrate((-a**2*c*x**2+c)**(3/2)*asin(a*x)**(3/2),x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{3/2}\,dx=\text{Exception raised: RuntimeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F(-2)]

Exception generated.

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{3/2}\,dx=\text{Exception raised: TypeError}$$

[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(3/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{3/2}\,dx=\int \mathrm{asin}(a\,x)^{3/2}\,\left(c-a^2\,c\,x^2\right)^{3/2}\,dx$$

[In] int(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(3/2),x)

[Out] int(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(3/2), x)

3.448 $\int \sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 219

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}\,dx = \frac{3\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{16a\sqrt{1-a^2x^2}} - \frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}{5a\sqrt{1-a^2x^2}} - \frac{3\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}}$$

```
[Out] 1/2*x*arcsin(a*x)^(3/2)*(-a^2*c*x^2+c)^(1/2)+1/5*arcsin(a*x)^(5/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-3/32*FresnelC(2*arcsin(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+3/16*(-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)/a/(-a^2*x^2+1)^(1/2)-3/8*a*x^2*(-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)/(-a^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 219, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4741, 4737, 4725, 4809, 3393, 3385, 3433}

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}\,dx = -\frac{3\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}} + \frac{\arcsin(ax)^{5/2}\sqrt{c-a^2cx^2}}{5a\sqrt{1-a^2x^2}} + \frac{1}{2}x\arcsin(ax)^{3/2}\sqrt{c-a^2cx^2} - \frac{3ax^2\sqrt{\arcsin(ax)}\sqrt{c-a^2cx^2}}{8\sqrt{1-a^2x^2}} + \frac{3\sqrt{\arcsin(ax)}\sqrt{c-a^2cx^2}}{16a\sqrt{1-a^2x^2}}$$

```
[In] Int[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2),x]
```

```
[Out] (3*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(16*a*Sqrt[1 - a^2*x^2]) - (3*a*x
^2*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(8*Sqrt[1 - a^2*x^2]) + (x*Sqrt[c
 - a^2*c*x^2]*ArcSin[a*x]^(3/2))/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2)
)/(5*a*Sqrt[1 - a^2*x^2]) - (3*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqr
t[ArcSin[a*x]])/Sqrt[Pi]])/(32*a*Sqrt[1 - a^2*x^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{\sqrt{c-a^2cx^2}\int\frac{\arcsin(ax)^{3/2}}{\sqrt{1-a^2x^2}}\,dx}{2\sqrt{1-a^2x^2}} - \frac{\left(3a\sqrt{c-a^2cx^2}\right)\int x\sqrt{\arcsin(ax)}\,dx}{4\sqrt{1-a^2x^2}}$$

$$= -\frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}{5a\sqrt{1-a^2x^2}} + \frac{\left(3a^2\sqrt{c-a^2cx^2}\right)\int\frac{x^2}{\sqrt{1-a^2x^2}\sqrt{\arcsin(ax)}}\,dx}{16\sqrt{1-a^2x^2}}$$

$$= -\frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}{5a\sqrt{1-a^2x^2}} + \frac{\left(3\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\sin^2(x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{16a\sqrt{1-a^2x^2}}$$

$$= -\frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}{5a\sqrt{1-a^2x^2}} + \frac{\left(3\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\left(\frac{1}{2\sqrt{x}}-\frac{\cos(2x)}{2\sqrt{x}}\right)dx, x, \arcsin(ax)\right)}{16a\sqrt{1-a^2x^2}}$$

$$= \frac{3\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{16a\sqrt{1-a^2x^2}} - \frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}{5a\sqrt{1-a^2x^2}} - \frac{\left(3\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\cos(2x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{32a\sqrt{1-a^2x^2}}$$

$$= \frac{3\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{16a\sqrt{1-a^2x^2}} - \frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}{5a\sqrt{1-a^2x^2}} - \frac{\left(3\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\cos\left(2x^2\right)dx, x, \sqrt{\arcsin(ax)}\right)}{16a\sqrt{1-a^2x^2}}$$

$$= \frac{3\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{16a\sqrt{1-a^2x^2}} - \frac{3ax^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}{5a\sqrt{1-a^2x^2}} - \frac{3\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.06 (sec) , antiderivative size = 144, normalized size of antiderivative = 0.66

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}\,dx = \frac{\sqrt{c-a^2cx^2}\left(32\arcsin(ax)^2\left(5ax\sqrt{1-a^2x^2}+2\arcsin(ax)\right)+15i\sqrt{2}\sqrt{-i\right.}{320a\sqrt{1-a^2\right.}$$

```
[In] Integrate[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2),x]
```

```
[Out] (Sqrt[c - a^2*c*x^2]*(32*ArcSin[a*x]^2*(5*a*x*Sqrt[1 - a^2*x^2] + 2*ArcSin[
a*x]) + (15*I)*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]*Gamma[3/2, (-2*I)*ArcSin[a*x]
] - (15*I)*Sqrt[2]*Sqrt[I*ArcSin[a*x]]*Gamma[3/2, (2*I)*ArcSin[a*x]]))/(320
*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]])
```

Maple [F]

$$\int \sqrt{-a^2c\,x^2+c}\,\arcsin(ax)^{\frac{3}{2}}\,dx$$

```
[In] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \sqrt{c - a^2cx^2} \arcsin(ax)^{3/2} \, dx = \int \sqrt{-c(ax-1)(ax+1)} \operatorname{asin}^{\frac{3}{2}}(ax) \, dx$$

```
[In] integrate((-a**2*c*x**2+c)**(1/2)*asin(a*x)**(3/2),x)
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))*asin(a*x)**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{c - a^2cx^2} \arcsin(ax)^{3/2} \, dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F(-2)]

Exception generated.

$$\int \sqrt{c - a^2cx^2} \arcsin(ax)^{3/2} \, dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(3/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{c - a^2cx^2} \arcsin(ax)^{3/2} \, dx = \int \operatorname{asin}(a\,x)^{3/2}\,\sqrt{c - a^2\,c\,x^2} \, dx$$

```
[In] int(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(1/2),x)
[Out] int(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(1/2), x)
```

3.449 $\int \frac{\arcsin(ax)^{3/2}}{\sqrt{c-a^2cx^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 44

$$\int \frac{\arcsin(ax)^{3/2}}{\sqrt{c-a^2cx^2}}\,dx = \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^{5/2}}{5a\sqrt{c-a^2cx^2}}$$

```
[Out] 2/5*arcsin(a*x)^(5/2)*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042, Rules used = {4737}

$$\int \frac{\arcsin(ax)^{3/2}}{\sqrt{c-a^2cx^2}}\,dx = \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^{5/2}}{5a\sqrt{c-a^2cx^2}}$$

```
[In] Int[ArcSin[a*x]^(3/2)/Sqrt[c - a^2*c*x^2],x]
```

```
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(5/2))/(5*a*Sqrt[c - a^2*c*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral} = \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^{5/2}}{5a\sqrt{c-a^2cx^2}}$$

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)^{3/2}}{\sqrt{c-a^2cx^2}}\,dx = \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^{5/2}}{5a\sqrt{c-a^2cx^2}}$$

```
[In] Integrate[ArcSin[a*x]^(3/2)/Sqrt[c - a^2*c*x^2],x]
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(5/2))/(5*a*Sqrt[c - a^2*c*x^2])
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.86

method	result	size
default	$\frac{2\arcsin(ax)^{\frac{5}{2}}\sqrt{-a^2x^2+1}}{5a\sqrt{-c(a^2x^2-1)}}$	38

```
[In] int(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/5*arcsin(a*x)^(5/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\arcsin(ax)^{3/2}}{\sqrt{c-a^2cx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{\arcsin(ax)^{3/2}}{\sqrt{c-a^2cx^2}}\,dx = \int \frac{\operatorname{asin}^{\frac{3}{2}}(ax)}{\sqrt{-c(ax-1)(ax+1)}}\,dx$$

```
[In] integrate(asin(a*x)**(3/2)/(-a**2*c*x**2+c)**(1/2),x)
[Out] Integral(asin(a*x)**(3/2)/sqrt(-c*(a*x - 1)*(a*x + 1)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(ax)^{3/2}}{\sqrt{c-a^2cx^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{\arcsin(ax)^{3/2}}{\sqrt{c-a^2cx^2}}\,dx = \int \frac{\arcsin\left(ax\right)^{\frac{3}{2}}}{\sqrt{-a^2cx^2+c}}\,dx$$

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^(3/2)/sqrt(-a^2*c*x^2 + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^{3/2}}{\sqrt{c-a^2cx^2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^{3/2}}{\sqrt{c-a^2\,c\,x^2}}\,dx$$

```
[In] int(asin(a*x)^(3/2)/(c - a^2*c*x^2)^(1/2),x)
```

```
[Out] int(asin(a*x)^(3/2)/(c - a^2*c*x^2)^(1/2), x)
```

3.450 $\int \frac{\arcsin(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{\arcsin(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx=\frac{x\arcsin(ax)^{3/2}}{c\sqrt{c-a^2cx^2}}-\frac{3a\sqrt{1-a^2x^2}\,\mathrm{Int}\left(\frac{x\sqrt{\arcsin(ax)}}{1-a^2x^2},x\right)}{2c\sqrt{c-a^2cx^2}}$$

```
[Out] x*arcsin(a*x)^(3/2)/c/(-a^2*c*x^2+c)^(1/2)-3/2*a*(-a^2*x^2+1)^(1/2)*Uninteg
rable(x*arcsin(a*x)^(1/2)/(-a^2*x^2+1),x)/c/(-a^2*c*x^2+c)^(1/2)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\arcsin(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx=\int \frac{\arcsin(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx$$

```
[In] Int[ArcSin[a*x]^(3/2)/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*ArcSin[a*x]^(3/2))/(c*Sqrt[c - a^2*c*x^2]) - (3*a*Sqrt[1 - a^2*x^2]*Defe
r[Int][(x*Sqrt[ArcSin[a*x]])/(1 - a^2*x^2), x])/(2*c*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\text{integral}=\frac{x\arcsin(ax)^{3/2}}{c\sqrt{c-a^2cx^2}}-\frac{\left(3a\sqrt{1-a^2x^2}\right)\int \frac{x\sqrt{\arcsin(ax)}}{1-a^2x^2}\,dx}{2c\sqrt{c-a^2cx^2}}$$

Mathematica [N/A]

Not integrable

Time = 2.20 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{\arcsin(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\arcsin(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx$$

```
[In] Integrate[ArcSin[a*x]^(3/2)/(c - a^2*c*x^2)^(3/2),x]
[Out] Integrate[ArcSin[a*x]^(3/2)/(c - a^2*c*x^2)^(3/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.21 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int \frac{\arcsin(ax)^{\frac{3}{2}}}{(-a^2c\,x^2+c)^{\frac{3}{2}}}dx$$

```
[In] int(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x)
[Out] int(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\arcsin(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 16.07 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{\arcsin(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\operatorname{asin}^{\frac{3}{2}}(ax)}{(-c(ax-1)(ax+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(asin(a*x)**(3/2)/(-a**2*c*x**2+c)**(3/2),x)
[Out] Integral(asin(a*x)**(3/2)/(-c*(a*x - 1)*(a*x + 1))**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.80 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\arcsin(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\arcsin(ax)^{\frac{3}{2}}}{(-a^2cx^2+c)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^(3/2)/(-a^2*c*x^2 + c)^(3/2), x)
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\arcsin(ax)^{3/2}}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^{3/2}}{(c-a^2\,c\,x^2)^{3/2}}\,dx$$

```
[In] int(asin(a*x)^(3/2)/(c - a^2*c*x^2)^(3/2),x)
[Out] int(asin(a*x)^(3/2)/(c - a^2*c*x^2)^(3/2), x)
```

3.451 $\int \left(c-a^2cx^2\right)^{3/2} \arcsin(ax)^{5/2} \, dx$

Optimal result

Integrand size = 24, antiderivative size = 431

$$\int \left(c-a^2cx^2\right)^{3/2} \arcsin(ax)^{5/2} \, dx = -\frac{225}{512}cx\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}$$
$$-\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}+\frac{45c\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{256a\sqrt{1-a^2x^2}}$$
$$-\frac{15acx^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32\sqrt{1-a^2x^2}}+\frac{5c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32a}$$
$$+\frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}+\frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{28a\sqrt{1-a^2x^2}}+\frac{15c\sqrt{\frac{\pi}{2}}\sqrt{c-}}{}$$

```
[Out] 1/4*x*(-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2)+5/32*c*(-a^2*x^2+1)^(3/2)*arcs
in(a*x)^(3/2)*(-a^2*c*x^2+c)^(1/2)/a+3/8*c*x*arcsin(a*x)^(5/2)*(-a^2*c*x^2+
c)^(1/2)+45/256*c*arcsin(a*x)^(3/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/
2)-15/32*a*c*x^2*arcsin(a*x)^(3/2)*(-a^2*c*x^2+c)^(1/2)/(-a^2*x^2+1)^(1/2)+
3/28*c*arcsin(a*x)^(7/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+15/8192*
c*FresnelS(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(-a^2*c*x
^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+15/128*c*FresnelS(2*arcsin(a*x)^(1/2)/Pi^(
1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-225/512*c*x*(-a^2*
c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)-15/256*c*x*(-a^2*x^2+1)*(-a^2*c*x^2+c)^(1/
2)*arcsin(a*x)^(1/2)
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 431, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4743, 4741, 4737, 4725, 4795, 4731, 4491, 12, 3386, 3432, 4767, 4809}

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}\,dx=\frac{15\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{4096a\sqrt{1-a^2x^2}}+\frac{15\sqrt{\pi}c\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{128a\sqrt{1-a^2x^2}}+\frac{3c\arcsin(ax)^{7/2}\sqrt{c-a^2cx^2}}{28a\sqrt{1-a^2x^2}}+\frac{1}{4}x\arcsin(ax)^{5/2}\left(c-a^2cx^2\right)^{3/2}+\frac{3}{8}cx\arcsin(ax)^{5/2}\sqrt{c-a^2cx^2}+\frac{5c\left(1-a^2x^2\right)^{3/2}\arcsin(ax)^{3/2}\sqrt{c-a^2cx^2}}{32a}-1$$

```
[In] Int[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2),x]
```

```
[Out] (-225*c*x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/512 - (15*c*x*(1 - a^2*x^2
)*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/256 + (45*c*Sqrt[c - a^2*c*x^2]*Ar
cSin[a*x]^(3/2))/(256*a*Sqrt[1 - a^2*x^2]) - (15*a*c*x^2*Sqrt[c - a^2*c*x^2
]*ArcSin[a*x]^(3/2))/(32*Sqrt[1 - a^2*x^2]) + (5*c*(1 - a^2*x^2)^(3/2)*Sqrt
[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))/(32*a) + (3*c*x*Sqrt[c - a^2*c*x^2]*ArcS
in[a*x]^(5/2))/8 + (x*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2))/4 + (3*c*Sqr
t[c - a^2*c*x^2]*ArcSin[a*x]^(7/2))/(28*a*Sqrt[1 - a^2*x^2]) + (15*c*Sqrt[P
i/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(4096*a*
Sqrt[1 - a^2*x^2]) + (15*c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[Ar
cSin[a*x]])/Sqrt[Pi]])/(128*a*Sqrt[1 - a^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
```

```
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
```

```
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}+\frac{1}{4}(3c)\int\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}\,dx - \frac{\left(5ac\sqrt{c-a^2cx^2}\right)\int x(1-a^2x^2)\arcsin(ax)^{3/2}\,dx}{8\sqrt{1-a^2x^2}}$$

$$= \frac{5c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32a}+\frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}-\frac{\left(15c\sqrt{c-a^2cx^2}\right)\int(1-a^2x^2)^{3/2}\sqrt{\arcsin(ax)}\,dx}{64\sqrt{1-a^2x^2}}+\frac{\left(3c\sqrt{c-a^2c\ldots}\right.}{8\sqrt{\ldots}}$$

$$= -\frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} - \frac{15acx^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32\sqrt{1-a^2x^2}}+\frac{5c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32a} + \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}+\frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}+\frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{28a\sqrt{1-a^2x^2}}-\frac{(45\ldots}{\ldots}$$

$$= -\frac{225}{512}cx\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} - \frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}$$
$$- \frac{15acx^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32\sqrt{1-a^2x^2}} + \frac{5c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32a}$$
$$+ \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2} + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{28a\sqrt{1-a^2x^2}} - \frac{(4}{}$$

$$= -\frac{225}{512}cx\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} - \frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}$$
$$+ \frac{45c\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{256a\sqrt{1-a^2x^2}} - \frac{15acx^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32\sqrt{1-a^2x^2}}$$
$$+ \frac{5c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32a}$$
$$+ \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2} + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{28a\sqrt{1-a^2x^2}} + \frac{(1}{}$$

$$= -\frac{225}{512}cx\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} - \frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}$$
$$+ \frac{45c\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{256a\sqrt{1-a^2x^2}} - \frac{15acx^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32\sqrt{1-a^2x^2}}$$
$$+ \frac{5c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32a}$$
$$+ \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2} + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{28a\sqrt{1-a^2x^2}} + \frac{(1}{}$$

$$= -\frac{225}{512}cx\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} - \frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}$$
$$+ \frac{45c\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{256a\sqrt{1-a^2x^2}} - \frac{15acx^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32\sqrt{1-a^2x^2}}$$
$$+ \frac{5c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32a}$$
$$+ \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2} + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{28a\sqrt{1-a^2x^2}} + \frac{(1}{}$$

$$= -\frac{225}{512}cx\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} - \frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}$$
$$+ \frac{45c\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{256a\sqrt{1-a^2x^2}} - \frac{15acx^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32\sqrt{1-a^2x^2}}$$
$$+ \frac{5c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32a}$$
$$+ \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2} + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{28a\sqrt{1-a^2x^2}} + \frac{15}{}$$

$$= -\frac{225}{512}cx\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} - \frac{15}{256}cx\left(1-a^2x^2\right)\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{45c\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{256a\sqrt{1-a^2x^2}} - \frac{15acx^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32\sqrt{1-a^2x^2}} + \frac{5c(1-a^2x^2)^{3/2}\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{32a} + \frac{3}{8}cx\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2} + \frac{1}{4}x\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2} + \frac{3c\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{28a\sqrt{1-a^2x^2}} + \frac{15c}{}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.34 (sec) , antiderivative size = 180, normalized size of antiderivative = 0.42

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}\,dx = \frac{c\sqrt{c-a^2cx^2}\left(1536\arcsin(ax)^4 + 4480\arcsin(ax)^2\cos(2\arcsin(ax)) + 1680\sqrt{\pi}\right.}{}$$

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2),x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(1536*ArcSin[a*x]^4 + 4480*ArcSin[a*x]^2*Cos[2*ArcSi
n[a*x]] + 1680*Sqrt[Pi]*Sqrt[ArcSin[a*x]]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sq
rt[Pi]] - 7*Sqrt[(-I)*ArcSin[a*x]]*Gamma[7/2, (-4*I)*ArcSin[a*x]] - 7*Sqrt[
I*ArcSin[a*x]]*Gamma[7/2, (4*I)*ArcSin[a*x]] - 3360*ArcSin[a*x]*Sin[2*ArcSi
n[a*x]] + 3584*ArcSin[a*x]^3*Sin[2*ArcSin[a*x]]))/(14336*a*Sqrt[1 - a^2*x^2
]*Sqrt[ArcSin[a*x]])
```

Maple [F]

$$\int \left(-a^2c\,x^2+c\right)^{\frac{3}{2}}\arcsin\left(ax\right)^{\frac{5}{2}}dx$$

```
[In] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}\,dx=\text{Timed out}$$

```
[In] integrate((-a**2*c*x**2+c)**(3/2)*asin(a*x)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}\,dx=\text{Exception raised: RuntimeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F(-2)]

Exception generated.

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)*arcsin(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}\,dx=\int \operatorname{asin}(a\,x)^{5/2}\,\left(c-a^2\,c\,x^2\right)^{3/2}\,dx$$

```
[In] int(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(3/2),x)
[Out] int(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(3/2), x)
```

3.452 $\int \sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 247

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}\,dx=-\frac{15}{32}x\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}+\frac{5\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{16a\sqrt{1-a^2x^2}}-\frac{5ax^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{8\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}+\frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{7a\sqrt{1-a^2x^2}}+\frac{15\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{128a\sqrt{1-a^2x^2}}$$

```
[Out] 1/2*x*arcsin(a*x)^(5/2)*(-a^2*c*x^2+c)^(1/2)+5/16*arcsin(a*x)^(3/2)*(-a^2*c
*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-5/8*a*x^2*arcsin(a*x)^(3/2)*(-a^2*c*x^2+
c)^(1/2)/(-a^2*x^2+1)^(1/2)+1/7*arcsin(a*x)^(7/2)*(-a^2*c*x^2+c)^(1/2)/a/(-
a^2*x^2+1)^(1/2)+15/128*FresnelS(2*arcsin(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a
^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-15/32*x*(-a^2*c*x^2+c)^(1/2)*arcsin(
a*x)^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 247, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$, Rules used = {4741, 4737, 4725, 4795, 4731, 4491, 12, 3386, 3432}

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}\,dx = \frac{15\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{128a\sqrt{1-a^2x^2}} + \frac{\arcsin(ax)^{7/2}\sqrt{c-a^2cx^2}}{7a\sqrt{1-a^2x^2}} + \frac{1}{2}x\arcsin(ax)^{5/2}\sqrt{c-a^2cx^2} - \frac{5ax^2\arcsin(ax)^{3/2}\sqrt{c-a^2cx^2}}{8\sqrt{1-a^2x^2}} + \frac{5\arcsin(ax)^{3/2}\sqrt{c-a^2cx^2}}{16a\sqrt{1-a^2x^2}} - \frac{15}{32}x\sqrt{\arcsin(ax)}\sqrt{c-a^2cx^2}$$

```
[In] Int[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2),x]
```

```
[Out] (-15*x*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/32 + (5*Sqrt[c - a^2*c*x^2]*A
rcSin[a*x]^(3/2))/(16*a*Sqrt[1 - a^2*x^2]) - (5*a*x^2*Sqrt[c - a^2*c*x^2]*A
rcSin[a*x]^(3/2))/(8*Sqrt[1 - a^2*x^2]) + (x*Sqrt[c - a^2*c*x^2]*ArcSin[a*x
]^(5/2))/2 + (Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(7/2))/(7*a*Sqrt[1 - a^2*x^2]
) + (15*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi
]])/(128*a*Sqrt[1 - a^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
```

```
tQ[p, 0]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}+\frac{\sqrt{c-a^2cx^2}\int\frac{\arcsin(ax)^{5/2}}{\sqrt{1-a^2x^2}}\,dx}{2\sqrt{1-a^2x^2}} \\
&\quad -\frac{\left(5a\sqrt{c-a^2cx^2}\right)\int x\arcsin(ax)^{3/2}\,dx}{4\sqrt{1-a^2x^2}} \\
&= -\frac{5ax^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{8\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2} \\
&\quad +\frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{7a\sqrt{1-a^2x^2}}+\frac{\left(15a^2\sqrt{c-a^2cx^2}\right)\int\frac{x^2\sqrt{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx}{16\sqrt{1-a^2x^2}} \\
&= -\frac{15}{32}x\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}-\frac{5ax^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{8\sqrt{1-a^2x^2}} \\
&\quad +\frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}+\frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{7a\sqrt{1-a^2x^2}} \\
&\quad +\frac{\left(15\sqrt{c-a^2cx^2}\right)\int\frac{\sqrt{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx}{32\sqrt{1-a^2x^2}}+\frac{\left(15a\sqrt{c-a^2cx^2}\right)\int\frac{x}{\sqrt{\arcsin(ax)}}\,dx}{64\sqrt{1-a^2x^2}} \\
&= -\frac{15}{32}x\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}+\frac{5\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} \\
&\quad -\frac{5ax^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{8\sqrt{1-a^2x^2}} \\
&\quad +\frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}+\frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{7a\sqrt{1-a^2x^2}} \\
&\quad +\frac{\left(15\sqrt{c-a^2cx^2}\right)\operatorname{Subst}\left(\int\frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{64a\sqrt{1-a^2x^2}} \\
&= -\frac{15}{32}x\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}+\frac{5\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} \\
&\quad -\frac{5ax^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{8\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2} \\
&\quad +\frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{7a\sqrt{1-a^2x^2}}+\frac{\left(15\sqrt{c-a^2cx^2}\right)\operatorname{Subst}\left(\int\frac{\sin(2x)}{2\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{64a\sqrt{1-a^2x^2}} \\
&= -\frac{15}{32}x\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}+\frac{5\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} \\
&\quad -\frac{5ax^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{8\sqrt{1-a^2x^2}}+\frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2} \\
&\quad +\frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{7a\sqrt{1-a^2x^2}}+\frac{\left(15\sqrt{c-a^2cx^2}\right)\operatorname{Subst}\left(\int\frac{\sin(2x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{128a\sqrt{1-a^2x^2}}
\end{aligned}$$

$$= -\frac{15}{32}x\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{5\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} - \frac{5ax^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{7a\sqrt{1-a^2x^2}} + \frac{\left(15\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \sin\left(2x^2\right)\,dx, x, \sqrt{\arcsin(ax)}\right)}{64a\sqrt{1-a^2x^2}}$$

$$= -\frac{15}{32}x\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)} + \frac{5\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{16a\sqrt{1-a^2x^2}} - \frac{5ax^2\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}{8\sqrt{1-a^2x^2}} + \frac{1}{2}x\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2} + \frac{\sqrt{c-a^2cx^2}\arcsin(ax)^{7/2}}{7a\sqrt{1-a^2x^2}} + \frac{15\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{128a\sqrt{1-a^2x^2}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.06 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.57

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}\,dx = \frac{\sqrt{c-a^2cx^2}\Big(64\arcsin(ax)^3\left(7ax\sqrt{1-a^2x^2}+2\arcsin(ax)\right)-35\sqrt{2}\sqrt{-i\,a}}{896a\sqrt{1-a^2x}}$$

```
[In] Integrate[Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2),x]
```

```
[Out] (Sqrt[c - a^2*c*x^2]*(64*ArcSin[a*x]^3*(7*a*x*Sqrt[1 - a^2*x^2] + 2*ArcSin[
a*x]) - 35*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]*Gamma[5/2, (-2*I)*ArcSin[a*x]] -
35*Sqrt[2]*Sqrt[I*ArcSin[a*x]]*Gamma[5/2, (2*I)*ArcSin[a*x]]))/(896*a*Sqrt[
1 - a^2*x^2]*Sqrt[ArcSin[a*x]])
```

Maple [F]

$$\int \sqrt{-a^2c\,x^2+c}\,\arcsin(ax)^{\frac{5}{2}}\,dx$$

```
[In] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}\,dx = \text{Timed out}$$

```
[In] integrate((-a**2*c*x**2+c)**(1/2)*asin(a*x)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F(-2)]

Exception generated.

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}\,dx=\int \mathrm{asin}(a\,x)^{5/2}\,\sqrt{c-a^2\,c\,x^2}\,dx$$

```
[In] int(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(1/2),x)
[Out] int(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(1/2), x)
```

3.453 $\int \frac{\arcsin(ax)^{5/2}}{\sqrt{c-a^2cx^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 44

$$\int \frac{\arcsin(ax)^{5/2}}{\sqrt{c-a^2cx^2}}\,dx=\frac{2\sqrt{1-a^2x^2}\arcsin(ax)^{7/2}}{7a\sqrt{c-a^2cx^2}}$$

```
[Out] 2/7*arcsin(a*x)^(7/2)*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042, Rules used = {4737}

$$\int \frac{\arcsin(ax)^{5/2}}{\sqrt{c-a^2cx^2}}\,dx=\frac{2\sqrt{1-a^2x^2}\arcsin(ax)^{7/2}}{7a\sqrt{c-a^2cx^2}}$$

```
[In] Int[ArcSin[a*x]^(5/2)/Sqrt[c - a^2*c*x^2],x]
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(7/2))/(7*a*Sqrt[c - a^2*c*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral}=\frac{2\sqrt{1-a^2x^2}\arcsin(ax)^{7/2}}{7a\sqrt{c-a^2cx^2}}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)^{5/2}}{\sqrt{c-a^2cx^2}}\,dx = \frac{2\sqrt{1-a^2x^2}\arcsin(ax)^{7/2}}{7a\sqrt{c-a^2cx^2}}$$

```
[In] Integrate[ArcSin[a*x]^(5/2)/Sqrt[c - a^2*c*x^2],x]
[Out] (2*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(7/2))/(7*a*Sqrt[c - a^2*c*x^2])
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.86

method	result	size
default	$\frac{2\arcsin(ax)^{\frac{7}{2}}\sqrt{-a^2x^2+1}}{7a\sqrt{-c(a^2x^2-1)}}$	38

```
[In] int(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/7*arcsin(a*x)^(7/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\arcsin(ax)^{5/2}}{\sqrt{c-a^2cx^2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^{5/2}}{\sqrt{c-a^2cx^2}}\,dx = \text{Timed out}$$

```
[In] integrate(asin(a*x)**(5/2)/(-a**2*c*x**2+c)**(1/2),x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(ax)^{5/2}}{\sqrt{c-a^2cx^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{\arcsin(ax)^{5/2}}{\sqrt{c-a^2cx^2}}\,dx = \int \frac{\arcsin{(ax)}^{\frac{5}{2}}}{\sqrt{-a^2cx^2+c}}\,dx$$

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(a*x)^(5/2)/sqrt(-a^2*c*x^2 + c), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^{5/2}}{\sqrt{c-a^2cx^2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^{5/2}}{\sqrt{c-a^2\,c\,x^2}}\,dx$$

```
[In] int(asin(a*x)^(5/2)/(c - a^2*c*x^2)^(1/2),x)
```

```
[Out] int(asin(a*x)^(5/2)/(c - a^2*c*x^2)^(1/2), x)
```

3.454 $\int \frac{\arcsin(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{\arcsin(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx = \frac{x\arcsin(ax)^{5/2}}{c\sqrt{c-a^2cx^2}} - \frac{5a\sqrt{1-a^2x^2}\,\mathrm{Int}\left(\frac{x\arcsin(ax)^{3/2}}{1-a^2x^2},x\right)}{2c\sqrt{c-a^2cx^2}}$$

```
[Out] x*arcsin(a*x)^(5/2)/c/(-a^2*c*x^2+c)^(1/2)-5/2*a*(-a^2*x^2+1)^(1/2)*Uninteg
rable(x*arcsin(a*x)^(3/2)/(-a^2*x^2+1),x)/c/(-a^2*c*x^2+c)^(1/2)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\arcsin(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\arcsin(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx$$

```
[In] Int[ArcSin[a*x]^(5/2)/(c - a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*ArcSin[a*x]^(5/2))/(c*Sqrt[c - a^2*c*x^2]) - (5*a*Sqrt[1 - a^2*x^2]*Defe
r[Int][(x*ArcSin[a*x]^(3/2))/(1 - a^2*x^2), x])/(2*c*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\text{integral} = \frac{x\arcsin(ax)^{5/2}}{c\sqrt{c-a^2cx^2}} - \frac{\left(5a\sqrt{1-a^2x^2}\right)\int \frac{x\arcsin(ax)^{3/2}}{1-a^2x^2}\,dx}{2c\sqrt{c-a^2cx^2}}$$

Mathematica [N/A]

Not integrable

Time = 3.47 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{\arcsin(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\arcsin(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx$$

```
[In] Integrate[ArcSin[a*x]^(5/2)/(c - a^2*c*x^2)^(3/2),x]
[Out] Integrate[ArcSin[a*x]^(5/2)/(c - a^2*c*x^2)^(3/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.23 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int \frac{\arcsin\left(ax\right)^{\frac{5}{2}}}{\left(-a^{2}c\,x^{2}+c\right)^{\frac{3}{2}}}dx$$

```
[In] int(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x)
[Out] int(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\arcsin(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\arcsin(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(asin(a*x)**(5/2)/(-a**2*c*x**2+c)**(3/2),x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.85 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\arcsin(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\arcsin\left(ax\right)^{\frac{5}{2}}}{\left(-a^2cx^2+c\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^(5/2)/(-a^2*c*x^2 + c)^(3/2), x)
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\arcsin(ax)^{5/2}}{(c-a^2cx^2)^{3/2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^{5/2}}{{\left(c-a^2\,c\,x^2\right)}^{3/2}}\,dx$$

```
[In] int(asin(a*x)^(5/2)/(c - a^2*c*x^2)^(3/2),x)
[Out] int(asin(a*x)^(5/2)/(c - a^2*c*x^2)^(3/2), x)
```

3.455 $\int (a^2-x^2)^{3/2} \sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 226

$$\begin{aligned}\int (a^2-x^2)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx &= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)} \\ &+ \frac{1}{4}x(a^2-x^2)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)} + \frac{a^3\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}}{4\sqrt{1-\frac{x^2}{a^2}}} \\ &- \frac{a^3\sqrt{\frac{\pi}{2}}\sqrt{a^2-x^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin\left(\frac{x}{a}\right)}\right)}{64\sqrt{1-\frac{x^2}{a^2}}} \\ &- \frac{a^3\sqrt{\pi}\sqrt{a^2-x^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{8\sqrt{1-\frac{x^2}{a^2}}}\end{aligned}$$

```
[Out] 1/4*a^3*arcsin(x/a)^(3/2)*(a^2-x^2)^(1/2)/(1-x^2/a^2)^(1/2)-1/128*a^3*Fresn
elS(2*2^(1/2)/Pi^(1/2)*arcsin(x/a)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2-x^2)^(1/2)/
(1-x^2/a^2)^(1/2)-1/8*a^3*FresnelS(2*arcsin(x/a)^(1/2)/Pi^(1/2))*Pi^(1/2)*(
a^2-x^2)^(1/2)/(1-x^2/a^2)^(1/2)+1/4*x*(a^2-x^2)^(3/2)*arcsin(x/a)^(1/2)+3/
8*a^2*x*(a^2-x^2)^(1/2)*arcsin(x/a)^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 226, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4743, 4741, 4737, 4731, 4491, 12, 3386, 3432, 4809}

$$\int \left(a^2-x^2\right)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx=\frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}+\frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}-\frac{\sqrt{\frac{\pi}{2}}a^3\sqrt{a^2-x^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin\left(\frac{x}{a}\right)}\right)}{64\sqrt{1-\frac{x^2}{a^2}}}-\frac{\sqrt{\pi}a^3\sqrt{a^2-x^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{8\sqrt{1-\frac{x^2}{a^2}}}+\frac{a^3\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}}{4\sqrt{1-\frac{x^2}{a^2}}}$$

```
[In] Int[(a^2 - x^2)^(3/2)*Sqrt[ArcSin[x/a]],x]
```

```
[Out] (3*a^2*x*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/8 + (x*(a^2 - x^2)^(3/2)*Sqrt[A
rcSin[x/a]])/4 + (a^3*Sqrt[a^2 - x^2]*ArcSin[x/a]^(3/2))/(4*Sqrt[1 - x^2/a^
2]) - (a^3*Sqrt[Pi/2]*Sqrt[a^2 - x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[x/a
]]])/(64*Sqrt[1 - x^2/a^2]) - (a^3*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelS[(2*Sqr
t[ArcSin[x/a]])/Sqrt[Pi]])/(8*Sqrt[1 - x^2/a^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)} + \frac{1}{4}\left(3a^2\right)\int\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx - \frac{\left(a\sqrt{a^2-x^2}\right)\int\frac{x\left(1-\frac{x^2}{a^2}\right)}{\sqrt{\arcsin\left(\frac{x}{a}\right)}}\,dx}{8\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}+\frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}-\frac{\left(3a\sqrt{a^2-x^2}\right)\int\frac{x}{\sqrt{\arcsin\left(\frac{x}{a}\right)}}\,dx}{16\sqrt{1-\frac{x^2}{a^2}}}$$
$$+\frac{\left(3a^2\sqrt{a^2-x^2}\right)\int\frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{1-\frac{x^2}{a^2}}}\,dx}{8\sqrt{1-\frac{x^2}{a^2}}}-\frac{\left(a^3\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\frac{\cos^3(x)\sin(x)}{\sqrt{x}}\,dx,x,\arcsin\left(\frac{x}{a}\right)\right)}{8\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}+\frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}$$
$$+\frac{a^3\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}}{4\sqrt{1-\frac{x^2}{a^2}}}$$
$$-\frac{\left(a^3\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\left(\frac{\sin(2x)}{4\sqrt{x}}+\frac{\sin(4x)}{8\sqrt{x}}\right)\,dx,x,\arcsin\left(\frac{x}{a}\right)\right)}{8\sqrt{1-\frac{x^2}{a^2}}}$$
$$-\frac{\left(3a^3\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx,x,\arcsin\left(\frac{x}{a}\right)\right)}{16\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}+\frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}$$
$$+\frac{a^3\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}}{4\sqrt{1-\frac{x^2}{a^2}}}-\frac{\left(a^3\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\frac{\sin(4x)}{\sqrt{x}}\,dx,x,\arcsin\left(\frac{x}{a}\right)\right)}{64\sqrt{1-\frac{x^2}{a^2}}}$$
$$-\frac{\left(a^3\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\frac{\sin(2x)}{\sqrt{x}}\,dx,x,\arcsin\left(\frac{x}{a}\right)\right)}{32\sqrt{1-\frac{x^2}{a^2}}}$$
$$-\frac{\left(3a^3\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\frac{\sin(2x)}{2\sqrt{x}}\,dx,x,\arcsin\left(\frac{x}{a}\right)\right)}{16\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)} + \frac{a^3\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}}{4\sqrt{1-\frac{x^2}{a^2}}} - \frac{\left(a^3\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\sin\left(4x^2\right)\,dx, x, \sqrt{\arcsin\left(\frac{x}{a}\right)}\right)}{32\sqrt{1-\frac{x^2}{a^2}}} - \frac{\left(a^3\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\sin\left(2x^2\right)\,dx, x, \sqrt{\arcsin\left(\frac{x}{a}\right)}\right)}{16\sqrt{1-\frac{x^2}{a^2}}} - \frac{\left(3a^3\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\frac{\sin(2x)}{\sqrt{x}}\,dx, x, \arcsin\left(\frac{x}{a}\right)\right)}{32\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)} + \frac{a^3\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}}{4\sqrt{1-\frac{x^2}{a^2}}} - \frac{a^3\sqrt{\frac{\pi}{2}}\sqrt{a^2-x^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin\left(\frac{x}{a}\right)}\right)}{64\sqrt{1-\frac{x^2}{a^2}}} - \frac{a^3\sqrt{\pi}\sqrt{a^2-x^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{32\sqrt{1-\frac{x^2}{a^2}}} - \frac{\left(3a^3\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\sin\left(2x^2\right)\,dx, x, \sqrt{\arcsin\left(\frac{x}{a}\right)}\right)}{16\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{3}{8}a^2x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)} + \frac{a^3\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}}{4\sqrt{1-\frac{x^2}{a^2}}} - \frac{a^3\sqrt{\frac{\pi}{2}}\sqrt{a^2-x^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin\left(\frac{x}{a}\right)}\right)}{64\sqrt{1-\frac{x^2}{a^2}}} - \frac{a^3\sqrt{\pi}\sqrt{a^2-x^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{8\sqrt{1-\frac{x^2}{a^2}}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.20 (sec) , antiderivative size = 183, normalized size of antiderivative = 0.81

$$\int \left(a^2-x^2\right)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx = \frac{a^3\sqrt{a^2-x^2}\left(32\arcsin\left(\frac{x}{a}\right)^2 + 8\sqrt{2}\sqrt{-i\arcsin\left(\frac{x}{a}\right)}\,\Gamma\left(\frac{3}{2}, -2i\arcsin\left(\frac{x}{a}\right)\right) + 8\sqrt{2}\sqrt{i$$

1

```
[In] Integrate[(a^2 - x^2)^(3/2)*Sqrt[ArcSin[x/a]],x]
```

```
[Out] (a^3*Sqrt[a^2 - x^2]*(32*ArcSin[x/a]^2 + 8*Sqrt[2]*Sqrt[(-I)*ArcSin[x/a]]*G
amma[3/2, (-2*I)*ArcSin[x/a]] + 8*Sqrt[2]*Sqrt[I*ArcSin[x/a]]*Gamma[3/2, (2
*I)*ArcSin[x/a]] + Sqrt[(-I)*ArcSin[x/a]]*Gamma[3/2, (-4*I)*ArcSin[x/a]] +
Sqrt[I*ArcSin[x/a]]*Gamma[3/2, (4*I)*ArcSin[x/a]]))/(128*Sqrt[1 - x^2/a^2]*
Sqrt[ArcSin[x/a]])
```

Maple [F]

$$\int (a^2 - x^2)^{\frac{3}{2}} \sqrt{\arcsin\left(\frac{x}{a}\right)}dx$$

```
[In] int((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x)
```

```
[Out] int((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int (a^2 - x^2)^{3/2} \sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int (a^2 - x^2)^{3/2} \sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx = \int (-(-a + x)(a + x))^{\frac{3}{2}} \sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}\,dx$$

```
[In] integrate((a**2-x**2)**(3/2)*asin(x/a)**(1/2),x)
```

```
[Out] Integral((-(-a + x)*(a + x))**(3/2)*sqrt(asin(x/a)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \left(a^2-x^2\right)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx=\text{Exception raised: RuntimeError}$$

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \left(a^2-x^2\right)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx=\int \left(a^2-x^2\right)^{\frac{3}{2}}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx$$

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(1/2),x, algorithm="giac")
[Out] integrate((a^2 - x^2)^(3/2)*sqrt(arcsin(x/a)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \left(a^2-x^2\right)^{3/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx=\int \sqrt{\mathrm{asin}\left(\frac{x}{a}\right)}\,\left(a^2-x^2\right)^{3/2}\,dx$$

```
[In] int(asin(x/a)^(1/2)*(a^2 - x^2)^(3/2),x)
[Out] int(asin(x/a)^(1/2)*(a^2 - x^2)^(3/2), x)
```

3.456 $\int \sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 126

$$\int \sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx = \frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}+\frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}}-\frac{a\sqrt{\pi}\sqrt{a^2-x^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{8\sqrt{1-\frac{x^2}{a^2}}}$$

```
[Out] 1/3*a*arcsin(x/a)^(3/2)*(a^2-x^2)^(1/2)/(1-x^2/a^2)^(1/2)-1/8*a*FresnelS(2*
arcsin(x/a)^(1/2)/Pi^(1/2))*Pi^(1/2)*(a^2-x^2)^(1/2)/(1-x^2/a^2)^(1/2)+1/2*
x*(a^2-x^2)^(1/2)*arcsin(x/a)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4741, 4737, 4731, 4491, 12, 3386, 3432}

$$\int \sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx = -\frac{\sqrt{\pi}a\sqrt{a^2-x^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{8\sqrt{1-\frac{x^2}{a^2}}}+\frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}$$

```
[In] Int[Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]],x]
```

```
[Out] (x*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/2 + (a*Sqrt[a^2 - x^2]*ArcSin[x/a]^(3
/2))/(3*Sqrt[1 - x^2/a^2]) - (a*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelS[(2*Sqrt[A
rcSin[x/a]])/Sqrt[Pi]])/(8*Sqrt[1 - x^2/a^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
```

```
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}+\frac{\sqrt{a^2-x^2}\int\frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{1-\frac{x^2}{a^2}}}\,dx}{2\sqrt{1-\frac{x^2}{a^2}}}-\frac{\sqrt{a^2-x^2}\int\frac{x}{\sqrt{\arcsin\left(\frac{x}{a}\right)}}\,dx}{4a\sqrt{1-\frac{x^2}{a^2}}}$$

$$=\frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}+\frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}}-\frac{\left(a\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx,x,\arcsin\left(\frac{x}{a}\right)\right)}{4\sqrt{1-\frac{x^2}{a^2}}}$$

$$=\frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}+\frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}}-\frac{\left(a\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\frac{\sin(2x)}{2\sqrt{x}}\,dx,x,\arcsin\left(\frac{x}{a}\right)\right)}{4\sqrt{1-\frac{x^2}{a^2}}}$$

$$=\frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}+\frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}}-\frac{\left(a\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\frac{\sin(2x)}{\sqrt{x}}\,dx,x,\arcsin\left(\frac{x}{a}\right)\right)}{8\sqrt{1-\frac{x^2}{a^2}}}$$

$$=\frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}+\frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}}-\frac{\left(a\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\sin\left(2x^2\right)\,dx,x,\sqrt{\arcsin\left(\frac{x}{a}\right)}\right)}{4\sqrt{1-\frac{x^2}{a^2}}}$$

$$=\frac{1}{2}x\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}+\frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{1-\frac{x^2}{a^2}}}-\frac{a\sqrt{\pi}\sqrt{a^2-x^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{8\sqrt{1-\frac{x^2}{a^2}}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.06 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.17

$$\int \sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx$$
$$=\frac{\sqrt{a^2-x^2}\left(48x\sqrt{1-\frac{x^2}{a^2}}\arcsin\left(\frac{x}{a}\right)+32a\arcsin\left(\frac{x}{a}\right)^2+3\sqrt{2}a\sqrt{-i\arcsin\left(\frac{x}{a}\right)}\Gamma\left(\frac{1}{2},-2i\arcsin\left(\frac{x}{a}\right)\right)+3\sqrt{2}a\sqrt{}\right.}{96\sqrt{1-\frac{x^2}{a^2}}\sqrt{\arcsin\left(\frac{x}{a}\right)}}$$

```
[In] Integrate[Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]],x]
[Out] (Sqrt[a^2 - x^2]*(48*x*Sqrt[1 - x^2/a^2]*ArcSin[x/a] + 32*a*ArcSin[x/a]^2 +
 3*Sqrt[2]*a*Sqrt[(-I)*ArcSin[x/a]]*Gamma[1/2, (-2*I)*ArcSin[x/a]] + 3*Sqrt
[2]*a*Sqrt[I*ArcSin[x/a]]*Gamma[1/2, (2*I)*ArcSin[x/a]]))/(96*Sqrt[1 - x^2/
a^2]*Sqrt[ArcSin[x/a]])
```

Maple [F]

$$\int \sqrt{a^2-x^2}\,\sqrt{\arcsin\left(\frac{x}{a}\right)}dx$$

```
[In] int((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x)
[Out] int((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \sqrt{a^2 - x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx = \int \sqrt{-(-a+x)(a+x)}\sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}\,dx$$

```
[In] integrate((a**2-x**2)**(1/2)*asin(x/a)**(1/2),x)
[Out] Integral(sqrt(-(-a + x)*(a + x))*sqrt(asin(x/a)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{a^2 - x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \sqrt{a^2 - x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx = \int \sqrt{a^2 - x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx$$

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(a^2 - x^2)*sqrt(arcsin(x/a)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a^2 - x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx = \int \sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}\,\sqrt{a^2 - x^2}\,dx$$

```
[In] int(asin(x/a)^(1/2)*(a^2 - x^2)^(1/2),x)
[Out] int(asin(x/a)^(1/2)*(a^2 - x^2)^(1/2), x)
```

3.457 $\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 42

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx = \frac{2a\sqrt{1-\frac{x^2}{a^2}}\arcsin\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{a^2-x^2}}$$

```
[Out] 2/3*a*arcsin(x/a)^(3/2)*(1-x^2/a^2)^(1/2)/(a^2-x^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042, Rules used = {4737}

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx = \frac{2a\sqrt{1-\frac{x^2}{a^2}}\arcsin\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{a^2-x^2}}$$

```
[In] Int[Sqrt[ArcSin[x/a]]/Sqrt[a^2 - x^2],x]
[Out] (2*a*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^(3/2))/(3*Sqrt[a^2 - x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral} = \frac{2a\sqrt{1-\frac{x^2}{a^2}}\arcsin\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{a^2-x^2}}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx = \frac{2a\sqrt{1-\frac{x^2}{a^2}}\arcsin\left(\frac{x}{a}\right)^{3/2}}{3\sqrt{a^2-x^2}}$$

```
[In] Integrate[Sqrt[ArcSin[x/a]]/Sqrt[a^2 - x^2],x]
[Out] (2*a*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^(3/2))/(3*Sqrt[a^2 - x^2])
```

Maple [A] (verified)

Time = 0.17 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.90

method	result	size
default	$\frac{2\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}} a\sqrt{\frac{a^2-x^2}{a^2}}}{3\sqrt{a^2-x^2}}$	38

```
[In] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/3*arcsin(x/a)^(3/2)*a/(a^2-x^2)^(1/2)*((a^2-x^2)/a^2)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.86

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx = -\frac{2}{3}\sqrt{-\arctan\left(-\frac{x}{\sqrt{a^2-x^2}}\right)}\arctan\left(-\frac{x}{\sqrt{a^2-x^2}}\right)$$

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(1/2),x, algorithm="fricas")
[Out] -2/3*sqrt(-arctan(-x/sqrt(a^2 - x^2)))*arctan(-x/sqrt(a^2 - x^2))
```

Sympy [F]

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx = \int \frac{\sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}}{\sqrt{-\left(-a+x\right)\left(a+x\right)}}\,dx$$

```
[In] integrate(asin(x/a)**(1/2)/(a**2-x**2)**(1/2),x)
[Out] Integral(sqrt(asin(x/a))/sqrt(-(-a + x)*(a + x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 15, normalized size of antiderivative = 0.36

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx = \frac{2\,|a|\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}}{3\,a}$$

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(1/2),x, algorithm="giac")
[Out] 2/3*abs(a)*arcsin(x/a)^(3/2)/a
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx = \int \frac{\sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}}{\sqrt{a^2-x^2}}\,dx$$

```
[In] int(asin(x/a)^(1/2)/(a^2 - x^2)^(1/2),x)
[Out] int(asin(x/a)^(1/2)/(a^2 - x^2)^(1/2), x)
```

3.458 $\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx=\frac{x\sqrt{\arcsin\left(\frac{x}{a}\right)}}{a^2\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\,\mathrm{Int}\left(\frac{x}{\left(1-\frac{x^2}{a^2}\right)\sqrt{\arcsin\left(\frac{x}{a}\right)}},x\right)}{2a^3\sqrt{a^2-x^2}}$$

```
[Out] x*arcsin(x/a)^(1/2)/a^2/(a^2-x^2)^(1/2)-1/2*(1-x^2/a^2)^(1/2)*Unintegrable(
x/(1-x^2/a^2)/arcsin(x/a)^(1/2),x)/a^3/(a^2-x^2)^(1/2)
```

Rubi [N/A]

Not integrable

Time = 0.05 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx=\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx$$

```
[In] Int[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(3/2),x]
```

```
[Out] (x*Sqrt[ArcSin[x/a]])/(a^2*Sqrt[a^2 - x^2]) - (Sqrt[1 - x^2/a^2]*Defer[Int]
[x/((1 - x^2/a^2)*Sqrt[ArcSin[x/a]]), x])/(2*a^3*Sqrt[a^2 - x^2])
```

Rubi steps

$$\text{integral}=\frac{x\sqrt{\arcsin\left(\frac{x}{a}\right)}}{a^2\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\int\frac{x}{\left(1-\frac{x^2}{a^2}\right)\sqrt{\arcsin\left(\frac{x}{a}\right)}}\,dx}{2a^3\sqrt{a^2-x^2}}$$

Mathematica [N/A]

Not integrable

Time = 2.87 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx=\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx$$

```
[In] Integrate[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(3/2),x]
[Out] Integrate[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(3/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.26 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{\frac{3}{2}}}dx$$

```
[In] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x)
[Out] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 2.42 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{(a^2-x^2)^{3/2}}\,dx = \int \frac{\sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}}{\left(-\left(-a+x\right)\left(a+x\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(asin(x/a)**(1/2)/(a**2-x**2)**(3/2),x)
[Out] Integral(sqrt(asin(x/a))/(-(-a + x)*(a + x))**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{(a^2-x^2)^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.76 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{(a^2-x^2)^{3/2}}\,dx = \int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{(a^2-x^2)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(3/2),x, algorithm="giac")
[Out] integrate(sqrt(arcsin(x/a))/(a^2 - x^2)^(3/2), x)
```

Mupad [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx=\int \frac{\sqrt{\mathrm{asin}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx$$

```
[In] int(asin(x/a)^(1/2)/(a^2 - x^2)^(3/2),x)
[Out] int(asin(x/a)^(1/2)/(a^2 - x^2)^(3/2), x)
```

3.459 $\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx=\frac{x\sqrt{\arcsin\left(\frac{x}{a}\right)}}{3a^2\left(a^2-x^2\right)^{3/2}}+\frac{2x\sqrt{\arcsin\left(\frac{x}{a}\right)}}{3a^4\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\,\mathrm{Int}\left(\frac{x}{\left(1-\frac{x^2}{a^2}\right)^2\sqrt{\arcsin\left(\frac{x}{a}\right)}},x\right)}{6a^5\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\,\mathrm{Int}\left(\frac{x}{\left(1-\frac{x^2}{a^2}\right)\sqrt{\arcsin\left(\frac{x}{a}\right)}},x\right)}{3a^5\sqrt{a^2-x^2}}$$

```
[Out] 1/3*x*arcsin(x/a)^(1/2)/a^2/(a^2-x^2)^(3/2)+2/3*x*arcsin(x/a)^(1/2)/a^4/(a^
2-x^2)^(1/2)-1/6*(1-x^2/a^2)^(1/2)*Unintegrable(x/(1-x^2/a^2)^2/arcsin(x/a)
^(1/2),x)/a^5/(a^2-x^2)^(1/2)-1/3*(1-x^2/a^2)^(1/2)*Unintegrable(x/(1-x^2/a
^2)/arcsin(x/a)^(1/2),x)/a^5/(a^2-x^2)^(1/2)
```

Rubi [N/A]

Not integrable

Time = 0.11 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx=\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx$$

```
[In] Int[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(5/2),x]
```

```
[Out] (x*Sqrt[ArcSin[x/a]])/(3*a^2*(a^2 - x^2)^(3/2)) + (2*x*Sqrt[ArcSin[x/a]])/(
3*a^4*Sqrt[a^2 - x^2]) - (Sqrt[1 - x^2/a^2]*Defer[Int][x/((1 - x^2/a^2)^2*S
```

```
qrt[ArcSin[x/a]]), x])/(6*a^5*Sqrt[a^2 - x^2]) - (Sqrt[1 - x^2/a^2]*Defer[I
nt][x/((1 - x^2/a^2)*Sqrt[ArcSin[x/a]]), x])/(3*a^5*Sqrt[a^2 - x^2])
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{x\sqrt{\arcsin\left(\frac{x}{a}\right)}}{3a^2\left(a^2-x^2\right)^{3/2}}+\frac{2\int\frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{3/2}}\,dx}{3a^2}-\frac{\sqrt{1-\frac{x^2}{a^2}}\int\frac{x}{\left(1-\frac{x^2}{a^2}\right)^2\sqrt{\arcsin\left(\frac{x}{a}\right)}}\,dx}{6a^5\sqrt{a^2-x^2}}\\ &= \frac{x\sqrt{\arcsin\left(\frac{x}{a}\right)}}{3a^2\left(a^2-x^2\right)^{3/2}}+\frac{2x\sqrt{\arcsin\left(\frac{x}{a}\right)}}{3a^4\sqrt{a^2-x^2}}\\ &\quad-\frac{\sqrt{1-\frac{x^2}{a^2}}\int\frac{x}{\left(1-\frac{x^2}{a^2}\right)^2\sqrt{\arcsin\left(\frac{x}{a}\right)}}\,dx}{6a^5\sqrt{a^2-x^2}}-\frac{\sqrt{1-\frac{x^2}{a^2}}\int\frac{x}{\left(1-\frac{x^2}{a^2}\right)\sqrt{\arcsin\left(\frac{x}{a}\right)}}\,dx}{3a^5\sqrt{a^2-x^2}}\end{aligned}$$

Mathematica [N/A]

Not integrable

Time = 3.07 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int\frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx=\int\frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx$$

```
[In] Integrate[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(5/2),x]
[Out] Integrate[Sqrt[ArcSin[x/a]]/(a^2 - x^2)^(5/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.27 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int\frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{\frac{5}{2}}}dx$$

```
[In] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x)
[Out] int(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 25.90 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx = \int \frac{\sqrt{\operatorname{asin}\left(\frac{x}{a}\right)}}{\left(-\left(-a+x\right)\left(a+x\right)\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(asin(x/a)**(1/2)/(a**2-x**2)**(5/2),x)
```

```
[Out] Integral(sqrt(asin(x/a))/(-(-a + x)*(a + x))**(5/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.79 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx=\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(arcsin(x/a)^(1/2)/(a^2-x^2)^(5/2),x, algorithm="giac")
[Out] integrate(sqrt(arcsin(x/a))/(a^2 - x^2)^(5/2), x)
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx=\int \frac{\sqrt{\mathrm{asin}\left(\frac{x}{a}\right)}}{\left(a^2-x^2\right)^{5/2}}\,dx$$

```
[In] int(asin(x/a)^(1/2)/(a^2 - x^2)^(5/2),x)
[Out] int(asin(x/a)^(1/2)/(a^2 - x^2)^(5/2), x)
```

3.460 $\int \left(a^2-x^2\right)^{3/2} \arcsin\left(\frac{x}{a}\right)^{3/2} dx$

Optimal result

Integrand size = 24, antiderivative size = 359

$$\int \left(a^2-x^2\right)^{3/2} \arcsin\left(\frac{x}{a}\right)^{3/2} dx = \frac{27a^3\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}}$$

$$-\frac{9ax^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{3\left(a^2-x^2\right)^{5/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}}$$

$$+\frac{3}{8}a^2x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{1}{4}x\left(a^2-x^2\right)^{3/2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{3a^3\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{20\sqrt{1-\frac{x^2}{a^2}}}-\frac{3a^3\sqrt{\frac{\pi}{2}}\sqrt{a^2-x$$

```
[Out] 1/4*x*(a^2-x^2)^(3/2)*arcsin(x/a)^(3/2)+3/8*a^2*x*arcsin(x/a)^(3/2)*(a^2-x^
2)^(1/2)+3/20*a^3*arcsin(x/a)^(5/2)*(a^2-x^2)^(1/2)/(1-x^2/a^2)^(1/2)-3/102
4*a^3*FresnelC(2*2^(1/2)/Pi^(1/2)*arcsin(x/a)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2-
x^2)^(1/2)/(1-x^2/a^2)^(1/2)-3/32*a^3*FresnelC(2*arcsin(x/a)^(1/2)/Pi^(1/2)
)*Pi^(1/2)*(a^2-x^2)^(1/2)/(1-x^2/a^2)^(1/2)+3/32*(a^2-x^2)^(5/2)*arcsin(x/
a)^(1/2)/a/(1-x^2/a^2)^(1/2)+27/256*a^3*(a^2-x^2)^(1/2)*arcsin(x/a)^(1/2)/(
1-x^2/a^2)^(1/2)-9/32*a*x^2*(a^2-x^2)^(1/2)*arcsin(x/a)^(1/2)/(1-x^2/a^2)^(
1/2)
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 359, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4743, 4741, 4737, 4725, 4809, 3393, 3385, 3433, 4767, 4753}

$$\int \left(a^2-x^2\right)^{3/2} \arcsin\left(\frac{x}{a}\right)^{3/2} dx = \frac{3}{8}a^2x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2} - \frac{9ax^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\arcsin\left(\frac{x}{a}\right)^{3/2} + \frac{3\left(a^2-x^2\right)^{5/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}} - \frac{3\sqrt{\frac{\pi}{2}}a^3\sqrt{a^2-x^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin\left(\frac{x}{a}\right)}\right)}{512\sqrt{1-\frac{x^2}{a^2}}}$$

```
[In] Int[(a^2 - x^2)^(3/2)*ArcSin[x/a]^(3/2),x]
```

```
[Out] (27*a^3*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(256*Sqrt[1 - x^2/a^2]) - (9*a*x
^2*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(32*Sqrt[1 - x^2/a^2]) + (3*(a^2 - x^
2)^(5/2)*Sqrt[ArcSin[x/a]])/(32*a*Sqrt[1 - x^2/a^2]) + (3*a^2*x*Sqrt[a^2 -
x^2]*ArcSin[x/a]^(3/2))/8 + (x*(a^2 - x^2)^(3/2)*ArcSin[x/a]^(3/2))/4 + (3*
a^3*Sqrt[a^2 - x^2]*ArcSin[x/a]^(5/2))/(20*Sqrt[1 - x^2/a^2]) - (3*a^3*Sqrt
[Pi/2]*Sqrt[a^2 - x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[x/a]]])/(512*Sqrt[
1 - x^2/a^2]) - (3*a^3*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelC[(2*Sqrt[ArcSin[x/a
]])/Sqrt[Pi]])/(32*Sqrt[1 - x^2/a^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
```

```
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
```

```
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{1}{4}\left(3a^2\right)\int\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}dx-\frac{\left(3a\sqrt{a^2-x^2}\right)\int x\left(1-\frac{x^2}{a^2}\right)\sqrt{\arcsin\left(\frac{x}{a}\right)}dx}{8\sqrt{1-\frac{x^2}{a^2}}}$$

$$=\frac{3\left(a^2-x^2\right)^{5/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}}+\frac{3}{8}a^2x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{1}{4}x\left(a^2-x^2\right)^{3/2}\arcsin\left(\frac{x}{a}\right)^{3/2}-\frac{\left(9a\sqrt{a^2-x^2}\right)\int x\sqrt{\arcsin\left(\frac{x}{a}\right)}dx}{16\sqrt{1-\frac{x^2}{a^2}}}-\frac{\left(3a^2\sqrt{a^2-x^2}\right)\int\frac{\left(1-\frac{x^2}{a^2}\right)^{3/2}}{\sqrt{\arcsin\left(\frac{x}{a}\right)}}dx}{64\sqrt{1-\frac{x^2}{a^2}}}$$

$$=-\frac{9ax^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{3\left(a^2-x^2\right)^{5/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}}+\frac{3}{8}a^2x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{1}{4}x\left(a^2-x^2\right)^{3/2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{3a^3\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{20\sqrt{1-\frac{x^2}{a^2}}}+\frac{\left(9\sqrt{a^2-x^2}\right)\int\frac{x^2}{\sqrt{1-\frac{x^2}{a^2}}\sqrt{\arcsin\left(\frac{x}{a}\right)}}dx}{64\sqrt{1-\frac{x^2}{a^2}}}-$$

$$=-\frac{9ax^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{3\left(a^2-x^2\right)^{5/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}}+\frac{3}{8}a^2x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{1}{4}x\left(a^2-x^2\right)^{3/2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{3a^3\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{20\sqrt{1-\frac{x^2}{a^2}}}-\frac{\left(3a^3\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\left(\frac{3}{8\sqrt{x}}+\frac{\cos(2}{2\sqrt{}}\right.\right.}{64\sqrt{1-}}$$

$$=-\frac{9a^3\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}}-\frac{9ax^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{3\left(a^2-x^2\right)^{5/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}}+\frac{3}{8}a^2x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{1}{4}x\left(a^2-x^2\right)^{3/2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{3a^3\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{20\sqrt{1-\frac{x^2}{a^2}}}-\frac{\left(3a^3\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\frac{\cos(4x)}{\sqrt{x}}dx,x,\right.}{512\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{27a^3\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}} - \frac{9ax^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}} + \frac{3(a^2-x^2)^{5/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}} + \frac{3}{8}a^2x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\arcsin\left(\frac{x}{a}\right)^{3/2} + \frac{3a^3\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{20\sqrt{1-\frac{x^2}{a^2}}} - \frac{\left(3a^3\sqrt{a^2-x^2}\right)\mathrm{Subst}\left(\int\cos\left(4x^2\right)\,d\right.}{256\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{27a^3\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}} - \frac{9ax^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}} + \frac{3(a^2-x^2)^{5/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}} + \frac{3}{8}a^2x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\arcsin\left(\frac{x}{a}\right)^{3/2} + \frac{3a^3\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{20\sqrt{1-\frac{x^2}{a^2}}} - \frac{3a^3\sqrt{\frac{\pi}{2}}\sqrt{a^2-x^2}\,\mathrm{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\right.}{512\sqrt{1-\frac{x^2}{a^2}}}$$

$$= \frac{27a^3\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{256\sqrt{1-\frac{x^2}{a^2}}} - \frac{9ax^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32\sqrt{1-\frac{x^2}{a^2}}} + \frac{3(a^2-x^2)^{5/2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{32a\sqrt{1-\frac{x^2}{a^2}}} + \frac{3}{8}a^2x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2} + \frac{1}{4}x\left(a^2-x^2\right)^{3/2}\arcsin\left(\frac{x}{a}\right)^{3/2} + \frac{3a^3\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{20\sqrt{1-\frac{x^2}{a^2}}} - \frac{3a^3\sqrt{\frac{\pi}{2}}\sqrt{a^2-x^2}\,\mathrm{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\right.}{512\sqrt{1-\frac{x^2}{a^2}}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.43 (sec) , antiderivative size = 209, normalized size of antiderivative = 0.58

$$\int \left(a^2-x^2\right)^{3/2}\arcsin\left(\frac{x}{a}\right)^{3/2}\,dx = \frac{a^3\sqrt{a^2-x^2}\left(-240\sqrt{\pi}\sqrt{\arcsin\left(\frac{x}{a}\right)^2}\,\mathrm{FresnelC}\left(\frac{2\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)+\sqrt{\arcsin\left(\frac{x}{a}\right)}\left(5\sqrt{\right.\right.}{}$$

```
[In] Integrate[(a^2 - x^2)^(3/2)*ArcSin[x/a]^(3/2),x]
```

```
[Out] (a^3*Sqrt[a^2 - x^2]*(-240*Sqrt[Pi]*Sqrt[ArcSin[x/a]^2]*FresnelC[(2*Sqrt[Ar
cSin[x/a]])/Sqrt[Pi]] + Sqrt[ArcSin[x/a]]*(5*Sqrt[I*ArcSin[x/a]]*Gamma[5/2,
 (-4*I)*ArcSin[x/a]] + 5*Sqrt[(-I)*ArcSin[x/a]]*Gamma[5/2, (4*I)*ArcSin[x/a
]] + 32*Sqrt[ArcSin[x/a]^2]*(12*ArcSin[x/a]^2 + 15*Cos[2*ArcSin[x/a]] + 20*
ArcSin[x/a]*Sin[2*ArcSin[x/a]]))))/(2560*Sqrt[1 - x^2/a^2]*Sqrt[ArcSin[x/a]
^2])
```

Maple [F]

$$\int \left(a^2-x^2\right)^{\frac{3}{2}} \arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}} dx$$

```
[In] int((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x)
```

```
[Out] int((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \left(a^2-x^2\right)^{3/2} \arcsin\left(\frac{x}{a}\right)^{3/2} dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int \left(a^2-x^2\right)^{3/2} \arcsin\left(\frac{x}{a}\right)^{3/2} dx = \text{Timed out}$$

```
[In] integrate((a**2-x**2)**(3/2)*asin(x/a)**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \left(a^2-x^2\right)^{3/2}\arcsin\left(\frac{x}{a}\right)^{3/2}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \left(a^2-x^2\right)^{3/2}\arcsin\left(\frac{x}{a}\right)^{3/2}\,dx = \int \left(a^2-x^2\right)^{\frac{3}{2}}\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a^2-x^2)^(3/2)*arcsin(x/a)^(3/2),x, algorithm="giac")
[Out] integrate((a^2 - x^2)^(3/2)*arcsin(x/a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \left(a^2-x^2\right)^{3/2}\arcsin\left(\frac{x}{a}\right)^{3/2}\,dx = \int \mathrm{asin}\left(\frac{x}{a}\right)^{3/2}\left(a^2-x^2\right)^{3/2}\,dx$$

```
[In] int(asin(x/a)^(3/2)*(a^2 - x^2)^(3/2),x)
[Out] int(asin(x/a)^(3/2)*(a^2 - x^2)^(3/2), x)
```

3.461 $\int \sqrt{a^2-x^2} \arcsin\left(\frac{x}{a}\right)^{3/2} dx$

Optimal result

Integrand size = 24, antiderivative size = 215

$$\int \sqrt{a^2-x^2} \arcsin\left(\frac{x}{a}\right)^{3/2} dx = \frac{3a\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{16\sqrt{1-\frac{x^2}{a^2}}} - \frac{3x^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}} + \frac{1}{2}x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2} + \frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{1-\frac{x^2}{a^2}}} - \frac{3a\sqrt{\pi}\sqrt{a^2-x^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{32\sqrt{1-\frac{x^2}{a^2}}}$$

```
[Out] 1/2*x*arcsin(x/a)^(3/2)*(a^2-x^2)^(1/2)+1/5*a*arcsin(x/a)^(5/2)*(a^2-x^2)^(
1/2)/(1-x^2/a^2)^(1/2)-3/32*a*FresnelC(2*arcsin(x/a)^(1/2)/Pi^(1/2))*Pi^(1/
2)*(a^2-x^2)^(1/2)/(1-x^2/a^2)^(1/2)+3/16*a*(a^2-x^2)^(1/2)*arcsin(x/a)^(1/
2)/(1-x^2/a^2)^(1/2)-3/8*x^2*(a^2-x^2)^(1/2)*arcsin(x/a)^(1/2)/a/(1-x^2/a^2
)^(1/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.292$, Rules used

$= \{4741, 4737, 4725, 4809, 3393, 3385, 3433\}$

$$\int \sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}dx =$$
$$-\frac{3\sqrt{\pi}a\sqrt{a^2-x^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{32\sqrt{1-\frac{x^2}{a^2}}}+\frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{1-\frac{x^2}{a^2}}}$$
$$+\frac{1}{2}x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}-\frac{3x^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{3a\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{16\sqrt{1-\frac{x^2}{a^2}}}$$

```
[In] Int[Sqrt[a^2 - x^2]*ArcSin[x/a]^(3/2),x]
```

```
[Out] (3*a*Sqrt[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(16*Sqrt[1 - x^2/a^2]) - (3*x^2*Sqr
t[a^2 - x^2]*Sqrt[ArcSin[x/a]])/(8*a*Sqrt[1 - x^2/a^2]) + (x*Sqrt[a^2 - x^2
]*ArcSin[x/a]^(3/2))/2 + (a*Sqrt[a^2 - x^2]*ArcSin[x/a]^(5/2))/(5*Sqrt[1 -
x^2/a^2]) - (3*a*Sqrt[Pi]*Sqrt[a^2 - x^2]*FresnelC[(2*Sqrt[ArcSin[x/a]])/Sq
rt[Pi]])/(32*Sqrt[1 - x^2/a^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
```

```
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{2}x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{\sqrt{a^2-x^2}\int\frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{\sqrt{1-\frac{x^2}{a^2}}}\,dx}{2\sqrt{1-\frac{x^2}{a^2}}} \\
&\quad-\frac{\left(3\sqrt{a^2-x^2}\right)\int x\sqrt{\arcsin\left(\frac{x}{a}\right)}\,dx}{4a\sqrt{1-\frac{x^2}{a^2}}} \\
&= -\frac{3x^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2} \\
&\quad+\frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{1-\frac{x^2}{a^2}}}+\frac{\left(3\sqrt{a^2-x^2}\right)\int\frac{x^2}{\sqrt{1-\frac{x^2}{a^2}}\sqrt{\arcsin\left(\frac{x}{a}\right)}}\,dx}{16a^2\sqrt{1-\frac{x^2}{a^2}}} \\
&= -\frac{3x^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2} \\
&\quad+\frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{1-\frac{x^2}{a^2}}}+\frac{\left(3a\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\frac{\sin^2(x)}{\sqrt{x}}\,dx,x,\arcsin\left(\frac{x}{a}\right)\right)}{16\sqrt{1-\frac{x^2}{a^2}}}
\end{aligned}$$

$$=-\frac{3x^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{1-\frac{x^2}{a^2}}}+\frac{\left(3a\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\left(\frac{1}{2\sqrt{x}}-\frac{\cos(2x)}{2\sqrt{x}}\right)dx,x,\arcsin\left(\frac{x}{a}\right)\right)}{16\sqrt{1-\frac{x^2}{a^2}}}$$

$$=\frac{3a\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{16\sqrt{1-\frac{x^2}{a^2}}}-\frac{3x^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{1-\frac{x^2}{a^2}}}-\frac{\left(3a\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\frac{\cos(2x)}{\sqrt{x}}dx,x,\arcsin\left(\frac{x}{a}\right)\right)}{32\sqrt{1-\frac{x^2}{a^2}}}$$

$$=\frac{3a\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{16\sqrt{1-\frac{x^2}{a^2}}}-\frac{3x^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{1-\frac{x^2}{a^2}}}-\frac{\left(3a\sqrt{a^2-x^2}\right)\text{Subst}\left(\int\cos\left(2x^2\right)dx,x,\sqrt{\arcsin\left(\frac{x}{a}\right)}\right)}{16\sqrt{1-\frac{x^2}{a^2}}}$$

$$=\frac{3a\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{16\sqrt{1-\frac{x^2}{a^2}}}-\frac{3x^2\sqrt{a^2-x^2}\sqrt{\arcsin\left(\frac{x}{a}\right)}}{8a\sqrt{1-\frac{x^2}{a^2}}}+\frac{1}{2}x\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}+\frac{a\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{1-\frac{x^2}{a^2}}}-\frac{3a\sqrt{\pi}\sqrt{a^2-x^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin\left(\frac{x}{a}\right)}}{\sqrt{\pi}}\right)}{32\sqrt{1-\frac{x^2}{a^2}}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.06 (sec) , antiderivative size = 154, normalized size of antiderivative = 0.72

$$\int\sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}dx=\frac{\sqrt{a^2-x^2}\left(160x\sqrt{1-\frac{x^2}{a^2}}\arcsin\left(\frac{x}{a}\right)^2+64a\arcsin\left(\frac{x}{a}\right)^3+15i\sqrt{2}a\sqrt{-i\arcsi\right.}{320\sqrt{1-\frac{x^2}{a^2}}\sqrt{}}$$

```
[In] Integrate[Sqrt[a^2 - x^2]*ArcSin[x/a]^(3/2),x]
[Out] (Sqrt[a^2 - x^2]*(160*x*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^2 + 64*a*ArcSin[x/a]^
3 + (15*I)*Sqrt[2]*a*Sqrt[(-I)*ArcSin[x/a]]*Gamma[3/2, (-2*I)*ArcSin[x/a]]
- (15*I)*Sqrt[2]*a*Sqrt[I*ArcSin[x/a]]*Gamma[3/2, (2*I)*ArcSin[x/a]]))/(320
*Sqrt[1 - x^2/a^2]*Sqrt[ArcSin[x/a]])
```

Maple [F]

$$\int \sqrt{a^2-x^2}\,\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}dx$$

[In] int((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x)

[Out] int((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x)

Fricas [F(-2)]

Exception generated.

$$\int \sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}\,dx=\text{Exception raised: TypeError}$$

[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

Sympy [F]

$$\int \sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}\,dx=\int \sqrt{-(-a+x)\,(a+x)}\,\mathrm{asin}^{\frac{3}{2}}\left(\frac{x}{a}\right)dx$$

[In] integrate((a**2-x**2)**(1/2)*asin(x/a)**(3/2),x)

[Out] Integral(sqrt(-(-a + x)*(a + x))*asin(x/a)**(3/2), x)

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}\,dx=\text{Exception raised: RuntimeError}$$

[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x, algorithm="maxima")

[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negative exponent.

Giac [F]

$$\int \sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}\,dx = \int \sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a^2-x^2)^(1/2)*arcsin(x/a)^(3/2),x, algorithm="giac")
[Out] integrate(sqrt(a^2 - x^2)*arcsin(x/a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a^2-x^2}\arcsin\left(\frac{x}{a}\right)^{3/2}\,dx = \int \operatorname{asin}\left(\frac{x}{a}\right)^{3/2}\sqrt{a^2-x^2}\,dx$$

```
[In] int(asin(x/a)^(3/2)*(a^2 - x^2)^(1/2),x)
[Out] int(asin(x/a)^(3/2)*(a^2 - x^2)^(1/2), x)
```

3.462 $\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 42

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx=\frac{2a\sqrt{1-\frac{x^2}{a^2}}\arcsin\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{a^2-x^2}}$$

```
[Out] 2/5*a*arcsin(x/a)^(5/2)*(1-x^2/a^2)^(1/2)/(a^2-x^2)^(1/2)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042, Rules used = {4737}

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx=\frac{2a\sqrt{1-\frac{x^2}{a^2}}\arcsin\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{a^2-x^2}}$$

```
[In] Int[ArcSin[x/a]^(3/2)/Sqrt[a^2 - x^2],x]
```

```
[Out] (2*a*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^(5/2))/(5*Sqrt[a^2 - x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral}=\frac{2a\sqrt{1-\frac{x^2}{a^2}}\arcsin\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{a^2-x^2}}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx=\frac{2a\sqrt{1-\frac{x^2}{a^2}}\arcsin\left(\frac{x}{a}\right)^{5/2}}{5\sqrt{a^2-x^2}}$$

```
[In] Integrate[ArcSin[x/a]^(3/2)/Sqrt[a^2 - x^2],x]
[Out] (2*a*Sqrt[1 - x^2/a^2]*ArcSin[x/a]^(5/2))/(5*Sqrt[a^2 - x^2])
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.90

method	result	size
default	$\frac{2\arcsin\left(\frac{x}{a}\right)^{\frac{5}{2}} a\sqrt{\frac{a^2-x^2}{a^2}}}{5\sqrt{a^2-x^2}}$	38

```
[In] int(arcsin(x/a)^(3/2)/(a^2-x^2)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2/5*arcsin(x/a)^(5/2)*a/(a^2-x^2)^(1/2)*((a^2-x^2)/a^2)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.23 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.90

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx=\frac{2}{5}\sqrt{-\arctan\left(-\frac{x}{\sqrt{a^2-x^2}}\right)}\arctan\left(-\frac{x}{\sqrt{a^2-x^2}}\right)^2$$

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(1/2),x, algorithm="fricas")
[Out] 2/5*sqrt(-arctan(-x/sqrt(a^2 - x^2)))*arctan(-x/sqrt(a^2 - x^2))^2
```

Sympy [F]

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx = \int \frac{\operatorname{asin}^{\frac{3}{2}}\left(\frac{x}{a}\right)}{\sqrt{-\left(-a+x\right)\left(a+x\right)}}\,dx$$

```
[In] integrate(asin(x/a)**(3/2)/(a**2-x**2)**(1/2),x)
[Out] Integral(asin(x/a)**(3/2)/sqrt(-(-a + x)*(a + x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 15, normalized size of antiderivative = 0.36

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx = \frac{2\,|a|\arcsin\left(\frac{x}{a}\right)^{\frac{5}{2}}}{5\,a}$$

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(1/2),x, algorithm="giac")
[Out] 2/5*abs(a)*arcsin(x/a)^(5/2)/a
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx = \int \frac{\operatorname{asin}\left(\frac{x}{a}\right)^{3/2}}{\sqrt{a^2-x^2}}\,dx$$

```
[In] int(asin(x/a)^(3/2)/(a^2 - x^2)^(1/2),x)
[Out] int(asin(x/a)^(3/2)/(a^2 - x^2)^(1/2), x)
```

3.463 $\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{(a^2-x^2)^{3/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{(a^2-x^2)^{3/2}}\,dx = \frac{x\arcsin\left(\frac{x}{a}\right)^{3/2}}{a^2\sqrt{a^2-x^2}} - \frac{3\sqrt{1-\frac{x^2}{a^2}}\,\mathrm{Int}\left(\frac{x\sqrt{\arcsin\left(\frac{x}{a}\right)}}{1-\frac{x^2}{a^2}},x\right)}{2a^3\sqrt{a^2-x^2}}$$

```
[Out] x*arcsin(x/a)^(3/2)/a^2/(a^2-x^2)^(1/2)-3/2*(1-x^2/a^2)^(1/2)*Unintegrable(
x*arcsin(x/a)^(1/2)/(1-x^2/a^2),x)/a^3/(a^2-x^2)^(1/2)
```

Rubi [N/A]

Not integrable

Time = 0.05 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{(a^2-x^2)^{3/2}}\,dx = \int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{(a^2-x^2)^{3/2}}\,dx$$

```
[In] Int[ArcSin[x/a]^(3/2)/(a^2 - x^2)^(3/2),x]
```

```
[Out] (x*ArcSin[x/a]^(3/2))/(a^2*Sqrt[a^2 - x^2]) - (3*Sqrt[1 - x^2/a^2]*Defer[In
t][(x*Sqrt[ArcSin[x/a]])/(1 - x^2/a^2), x])/(2*a^3*Sqrt[a^2 - x^2])
```

Rubi steps

$$\text{integral} = \frac{x\arcsin\left(\frac{x}{a}\right)^{3/2}}{a^2\sqrt{a^2-x^2}} - \frac{\left(3\sqrt{1-\frac{x^2}{a^2}}\right)\int \frac{x\sqrt{\arcsin\left(\frac{x}{a}\right)}}{1-\frac{x^2}{a^2}}\,dx}{2a^3\sqrt{a^2-x^2}}$$

Mathematica [N/A]

Not integrable

Time = 3.12 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{(a^2-x^2)^{3/2}}\,dx = \int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{(a^2-x^2)^{3/2}}\,dx$$

```
[In] Integrate[ArcSin[x/a]^(3/2)/(a^2 - x^2)^(3/2),x]
[Out] Integrate[ArcSin[x/a]^(3/2)/(a^2 - x^2)^(3/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.21 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}}{(a^2-x^2)^{\frac{3}{2}}}dx$$

```
[In] int(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x)
[Out] int(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{(a^2-x^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 15.88 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{\left(a^2-x^2\right)^{3/2}}\,dx = \int \frac{\operatorname{asin}^{\frac{3}{2}}\left(\frac{x}{a}\right)}{\left(-\left(-a+x\right)\left(a+x\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(asin(x/a)**(3/2)/(a**2-x**2)**(3/2),x)
```

```
[Out] Integral(asin(x/a)**(3/2)/(-(-a + x)*(a + x))**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{\left(a^2-x^2\right)^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.90 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{\left(a^2-x^2\right)^{3/2}}\,dx = \int \frac{\arcsin\left(\frac{x}{a}\right)^{\frac{3}{2}}}{\left(a^2-x^2\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(arcsin(x/a)^(3/2)/(a^2-x^2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(arcsin(x/a)^(3/2)/(a^2 - x^2)^(3/2), x)
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\arcsin\left(\frac{x}{a}\right)^{3/2}}{\left(a^2-x^2\right)^{3/2}}\,dx=\int \frac{\mathrm{asin}\left(\frac{x}{a}\right)^{3/2}}{\left(a^2-x^2\right)^{3/2}}\,dx$$

```
[In] int(asin(x/a)^(3/2)/(a^2 - x^2)^(3/2),x)
[Out] int(asin(x/a)^(3/2)/(a^2 - x^2)^(3/2), x)
```

3.464 $\int \frac{x}{\sqrt{1-x^2}\sqrt{\arcsin(x)}} dx$

Optimal result

Integrand size = 19, antiderivative size = 25

$$\int \frac{x}{\sqrt{1-x^2}\sqrt{\arcsin(x)}} dx = \sqrt{2\pi}\,\text{FresnelS}\left(\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(x)}\right)$$

```
[Out] FresnelS(2^(1/2)/Pi^(1/2)*arcsin(x)^(1/2))*2^(1/2)*Pi^(1/2)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {4809, 3386, 3432}

$$\int \frac{x}{\sqrt{1-x^2}\sqrt{\arcsin(x)}} dx = \sqrt{2\pi}\,\text{FresnelS}\left(\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(x)}\right)$$

```
[In] Int[x/(Sqrt[1 - x^2]*Sqrt[ArcSin[x]]),x]
[Out] Sqrt[2*Pi]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcSin[x]]]
```

<u>Rule 3386</u>

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

<u>Rule 3432</u>

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \text{Subst}\left(\int \frac{\sin(x)}{\sqrt{x}}\,dx, x, \arcsin(x)\right)\\ &= 2\text{Subst}\left(\int \sin\left(x^2\right)\,dx, x, \sqrt{\arcsin(x)}\right)\\ &= \sqrt{2\pi}\,\text{FresnelS}\left(\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(x)}\right)\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.06 (sec) , antiderivative size = 53, normalized size of antiderivative = 2.12

$$\int \frac{x}{\sqrt{1-x^2}\sqrt{\arcsin(x)}}\,dx = -\frac{\sqrt{-i\arcsin(x)}\Gamma\left(\frac{1}{2},-i\arcsin(x)\right)+\sqrt{i\arcsin(x)}\Gamma\left(\frac{1}{2},i\arcsin(x)\right)}{2\sqrt{\arcsin(x)}}$$

```
[In] Integrate[x/(Sqrt[1 - x^2]*Sqrt[ArcSin[x]]),x]
[Out] -1/2*(Sqrt[(-I)*ArcSin[x]]*Gamma[1/2, (-I)*ArcSin[x]] + Sqrt[I*ArcSin[x]]*G
amma[1/2, I*ArcSin[x]])/Sqrt[ArcSin[x]]
```

Maple [A] (verified)

Time = 0.33 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.80

method	result	size
default	$\text{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{\arcsin(x)}}{\sqrt{\pi}}\right)\sqrt{2}\,\sqrt{\pi}$	20

```
[In] int(x/(-x^2+1)^(1/2)/arcsin(x)^(1/2),x,method=_RETURNVERBOSE)
[Out] FresnelS(2^(1/2)/Pi^(1/2)*arcsin(x)^(1/2))*2^(1/2)*Pi^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{x}{\sqrt{1-x^2}\sqrt{\arcsin(x)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x/(-x^2+1)^(1/2)/arcsin(x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{x}{\sqrt{1-x^2}\sqrt{\arcsin(x)}}\,dx = \int \frac{x}{\sqrt{-(x-1)(x+1)}\sqrt{\operatorname{asin}(x)}}\,dx$$

```
[In] integrate(x/(-x**2+1)**(1/2)/asin(x)**(1/2),x)
[Out] Integral(x/(sqrt(-(x - 1)*(x + 1))*sqrt(asin(x))), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{x}{\sqrt{1-x^2}\sqrt{\arcsin(x)}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(x/(-x^2+1)^(1/2)/arcsin(x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.31 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.48

$$\int \frac{x}{\sqrt{1-x^2}\sqrt{\arcsin(x)}}\,dx = \left(\frac{1}{4}i-\frac{1}{4}\right)\sqrt{2}\sqrt{\pi}\operatorname{erf}\left(\left(\frac{1}{2}i-\frac{1}{2}\right)\sqrt{2}\sqrt{\arcsin(x)}\right) - \left(\frac{1}{4}i+\frac{1}{4}\right)\sqrt{2}\sqrt{\pi}\operatorname{erf}\left(-\left(\frac{1}{2}i+\frac{1}{2}\right)\sqrt{2}\sqrt{\arcsin(x)}\right)$$

```
[In] integrate(x/(-x^2+1)^(1/2)/arcsin(x)^(1/2),x, algorithm="giac")
[Out] (1/4*I - 1/4)*sqrt(2)*sqrt(pi)*erf((1/2*I - 1/2)*sqrt(2)*sqrt(arcsin(x))) -
 (1/4*I + 1/4)*sqrt(2)*sqrt(pi)*erf(-(1/2*I + 1/2)*sqrt(2)*sqrt(arcsin(x)))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x}{\sqrt{1-x^2}\sqrt{\arcsin(x)}}\,dx = \int \frac{x}{\sqrt{\mathrm{asin}\,(x)}\,\sqrt{1-x^2}}\,dx$$

```
[In] int(x/(asin(x)^(1/2)*(1 - x^2)^(1/2)),x)
[Out] int(x/(asin(x)^(1/2)*(1 - x^2)^(1/2)), x)
```

3.465 $\int \frac{(c-a^2cx^2)^{5/2}}{\sqrt{\arcsin(ax)}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 244

$$\begin{aligned}\int \frac{(c-a^2cx^2)^{5/2}}{\sqrt{\arcsin(ax)}}\,dx &= \frac{5c^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{8a\sqrt{1-a^2x^2}} \\ &+ \frac{3c^2\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,\mathrm{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{16a\sqrt{1-a^2x^2}} \\ &+ \frac{c^2\sqrt{\frac{\pi}{3}}\sqrt{c-a^2cx^2}\,\mathrm{FresnelC}\left(2\sqrt{\frac{3}{\pi}}\sqrt{\arcsin(ax)}\right)}{32a\sqrt{1-a^2x^2}} \\ &+ \frac{15c^2\sqrt{\pi}\sqrt{c-a^2cx^2}\,\mathrm{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}}\end{aligned}$$

```
[Out] 1/96*c^2*(-a^2*c*x^2+c)^(1/2)*FresnelC(2*3^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2)
)*3^(1/2)*Pi^(1/2)/a/(-a^2*x^2+1)^(1/2)+3/32*c^2*(-a^2*c*x^2+c)^(1/2)*Fresn
elC(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a/(-a^2*x^2+1)^(
1/2)+15/32*c^2*(-a^2*c*x^2+c)^(1/2)*FresnelC(2*arcsin(a*x)^(1/2)/Pi^(1/2))*
Pi^(1/2)/a/(-a^2*x^2+1)^(1/2)+5/8*c^2*(-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2
)/a/(-a^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 244, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4753, 3393, 3385, 3433}

$$\int \frac{(c-a^2cx^2)^{5/2}}{\sqrt{\arcsin(ax)}}\,dx = \frac{3\sqrt{\frac{\pi}{2}}c^2\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{16a\sqrt{1-a^2x^2}} + \frac{\sqrt{\frac{\pi}{3}}c^2\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{3}{\pi}}\sqrt{\arcsin(ax)}\right)}{32a\sqrt{1-a^2x^2}} + \frac{15\sqrt{\pi}c^2\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}} + \frac{5c^2\sqrt{\arcsin(ax)}\sqrt{c-a^2cx^2}}{8a\sqrt{1-a^2x^2}}$$

```
[In] Int[(c - a^2*c*x^2)^(5/2)/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (5*c^2*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(8*a*Sqrt[1 - a^2*x^2]) + (3*
c^2*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]]
)/(16*a*Sqrt[1 - a^2*x^2]) + (c^2*Sqrt[Pi/3]*Sqrt[c - a^2*c*x^2]*FresnelC[2
*Sqrt[3/Pi]*Sqrt[ArcSin[a*x]]])/(32*a*Sqrt[1 - a^2*x^2]) + (15*c^2*Sqrt[Pi]
*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(32*a*Sqrt[1
 - a^2*x^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
```

```
c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\cos^6(x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= \frac{\left(c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\left(\frac{5}{16\sqrt{x}}+\frac{15\cos(2x)}{32\sqrt{x}}+\frac{3\cos(4x)}{16\sqrt{x}}+\frac{\cos(6x)}{32\sqrt{x}}\right)\,dx,x,\arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= \frac{5c^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{8a\sqrt{1-a^2x^2}}+\frac{\left(c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\cos(6x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{32a\sqrt{1-a^2x^2}}$$
$$+\frac{\left(3c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\cos(4x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{16a\sqrt{1-a^2x^2}}$$
$$+\frac{\left(15c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\cos(2x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{32a\sqrt{1-a^2x^2}}$$

$$= \frac{5c^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{8a\sqrt{1-a^2x^2}}$$
$$+\frac{\left(c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\cos\left(6x^2\right)\,dx,x,\sqrt{\arcsin(ax)}\right)}{16a\sqrt{1-a^2x^2}}$$
$$+\frac{\left(3c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\cos\left(4x^2\right)\,dx,x,\sqrt{\arcsin(ax)}\right)}{8a\sqrt{1-a^2x^2}}$$
$$+\frac{\left(15c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\cos\left(2x^2\right)\,dx,x,\sqrt{\arcsin(ax)}\right)}{16a\sqrt{1-a^2x^2}}$$

$$= \frac{5c^2\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{8a\sqrt{1-a^2x^2}}+\frac{3c^2\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{16a\sqrt{1-a^2x^2}}$$
$$+\frac{c^2\sqrt{\frac{\pi}{3}}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{3}{\pi}}\sqrt{\arcsin(ax)}\right)}{32a\sqrt{1-a^2x^2}}$$
$$+\frac{15c^2\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{32a\sqrt{1-a^2x^2}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.56 (sec) , antiderivative size = 336, normalized size of antiderivative = 1.38

$$\int \frac{(c-a^2cx^2)^{5/2}}{\sqrt{\arcsin(ax)}}\,dx = \frac{c^2\sqrt{c-a^2cx^2}\Big(240\arcsin(ax)\sqrt{\arcsin(ax)^2}+3i\sqrt{2}\Big(16(i\arcsin(ax))^{3/2}+\sqrt{-i\arcsin}}{}$$

```
[In] Integrate[(c - a^2*c*x^2)^(5/2)/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (c^2*Sqrt[c - a^2*c*x^2]*(240*ArcSin[a*x]*Sqrt[ArcSin[a*x]^2] + (3*I)*Sqrt[
2]*(16*(I*ArcSin[a*x])^(3/2) + Sqrt[(-I)*ArcSin[a*x]]*Sqrt[ArcSin[a*x]^2])*
Gamma[1/2, (-2*I)*ArcSin[a*x]] - (45*I)*Sqrt[2]*((-I)*ArcSin[a*x])^(3/2)*Ga
mma[1/2, (2*I)*ArcSin[a*x]] + (24*I)*(I*ArcSin[a*x])^(3/2)*Gamma[1/2, (-4*I
)*ArcSin[a*x]] + (6*I)*Sqrt[(-I)*ArcSin[a*x]]*Sqrt[ArcSin[a*x]^2]*Gamma[1/2
, (-4*I)*ArcSin[a*x]] - (18*I)*((-I)*ArcSin[a*x])^(3/2)*Gamma[1/2, (4*I)*Ar
cSin[a*x]] - I*Sqrt[6]*Sqrt[(-I)*ArcSin[a*x]]*Sqrt[ArcSin[a*x]^2]*Gamma[1/2
, (-6*I)*ArcSin[a*x]] - I*Sqrt[6]*((-I)*ArcSin[a*x])^(3/2)*Gamma[1/2, (6*I)
*ArcSin[a*x]]))/(384*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]]*Sqrt[ArcSin[a*x]
^2])
```

Maple [F]

$$\int \frac{(-a^2c\,x^2+c)^{\frac{5}{2}}}{\sqrt{\arcsin(ax)}}dx$$

```
[In] int((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(c-a^2cx^2)^{5/2}}{\sqrt{\arcsin(ax)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(c-a^2cx^2)^{5/2}}{\sqrt{\arcsin(ax)}}\,dx = \text{Timed out}$$

```
[In] integrate((-a**2*c*x**2+c)**(5/2)/asin(a*x)**(1/2),x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(c-a^2cx^2)^{5/2}}{\sqrt{\arcsin(ax)}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{(c-a^2cx^2)^{5/2}}{\sqrt{\arcsin(ax)}}\,dx = \int \frac{(-a^2cx^2+c)^{\frac{5}{2}}}{\sqrt{\arcsin(ax)}}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
[Out] integrate((-a^2*c*x^2 + c)^(5/2)/sqrt(arcsin(a*x)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(c-a^2cx^2)^{5/2}}{\sqrt{\arcsin(ax)}}\,dx = \int \frac{(c-a^2\,c\,x^2)^{5/2}}{\sqrt{\mathrm{asin}\,(a\,x)}}\,dx$$

```
[In] int((c - a^2*c*x^2)^(5/2)/asin(a*x)^(1/2),x)
[Out] int((c - a^2*c*x^2)^(5/2)/asin(a*x)^(1/2), x)
```

3.466 $\int \frac{(c-a^2cx^2)^{3/2}}{\sqrt{\arcsin(ax)}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 170

$$\int \frac{(c-a^2cx^2)^{3/2}}{\sqrt{\arcsin(ax)}}\,dx = \frac{3c\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{4a\sqrt{1-a^2x^2}} + \frac{c\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{8a\sqrt{1-a^2x^2}} + \frac{c\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}}$$

```
[Out] 1/16*c*FresnelC(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(-a^
2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+1/2*c*FresnelC(2*arcsin(a*x)^(1/2)/Pi
^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+3/4*c*(-a^2*c*x^
2+c)^(1/2)*arcsin(a*x)^(1/2)/a/(-a^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4753, 3393, 3385, 3433}

$$\int \frac{(c-a^2cx^2)^{3/2}}{\sqrt{\arcsin(ax)}}\,dx = \frac{\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{8a\sqrt{1-a^2x^2}} + \frac{\sqrt{\pi}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}} + \frac{3c\sqrt{\arcsin(ax)}\sqrt{c-a^2cx^2}}{4a\sqrt{1-a^2x^2}}$$

```
[In] Int[(c - a^2*c*x^2)^(3/2)/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (3*c*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(4*a*Sqrt[1 - a^2*x^2]) + (c*Sq
rt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(8*a
*Sqrt[1 - a^2*x^2]) + (c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcS
in[a*x]])/Sqrt[Pi]])/(2*a*Sqrt[1 - a^2*x^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos^4(x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \left(\frac{3}{8\sqrt{x}}+\frac{\cos(2x)}{2\sqrt{x}}+\frac{\cos(4x)}{8\sqrt{x}}\right)\,dx, x, \arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= \frac{3c\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{4a\sqrt{1-a^2x^2}}+\frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos(4x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{8a\sqrt{1-a^2x^2}}\\
&\quad+\frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{2a\sqrt{1-a^2x^2}}
\end{aligned}
$$

$$= \frac{3c\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{4a\sqrt{1-a^2x^2}} + \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\cos\left(4x^2\right)\,dx,x,\sqrt{\arcsin(ax)}\right)}{4a\sqrt{1-a^2x^2}} + \frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\cos\left(2x^2\right)\,dx,x,\sqrt{\arcsin(ax)}\right)}{a\sqrt{1-a^2x^2}}$$

$$= \frac{3c\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{4a\sqrt{1-a^2x^2}} + \frac{c\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{8a\sqrt{1-a^2x^2}} + \frac{c\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.28 (sec) , antiderivative size = 182, normalized size of antiderivative = 1.07

$$\int \frac{\left(c-a^2cx^2\right)^{3/2}}{\sqrt{\arcsin(ax)}}\,dx = \frac{c\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}\left(24\sqrt{\arcsin(ax)^2}-4\sqrt{2}\sqrt{i\arcsin(ax)}\Gamma\left(\frac{1}{2},-2i\arcsin(ax)\right)\right.}{}$$

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]]*(24*Sqrt[ArcSin[a*x]^2] - 4*Sqrt[2
]*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (-2*I)*ArcSin[a*x]] - 4*Sqrt[2]*Sqrt[(-I)*
ArcSin[a*x]]*Gamma[1/2, (2*I)*ArcSin[a*x]] - Sqrt[I*ArcSin[a*x]]*Gamma[1/2,
 (-4*I)*ArcSin[a*x]] - Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (4*I)*ArcSin[a*x]]
))/(32*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]^2])
```

Maple [F]

$$\int \frac{\left(-a^2c\,x^2+c\right)^{\frac{3}{2}}}{\sqrt{\arcsin\left(ax\right)}}dx$$

```
[In] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(c-a^2cx^2)^{3/2}}{\sqrt{\arcsin(ax)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{(c-a^2cx^2)^{3/2}}{\sqrt{\arcsin(ax)}}\,dx = \int \frac{(-c(ax-1)\,(ax+1))^{\frac{3}{2}}}{\sqrt{\operatorname{asin}(ax)}}\,dx$$

```
[In] integrate((-a**2*c*x**2+c)**(3/2)/asin(a*x)**(1/2),x)
[Out] Integral((-c*(a*x - 1)*(a*x + 1))**(3/2)/sqrt(asin(a*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(c-a^2cx^2)^{3/2}}{\sqrt{\arcsin(ax)}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{(c-a^2cx^2)^{3/2}}{\sqrt{\arcsin(ax)}}\,dx = \int \frac{(-a^2cx^2+c)^{\frac{3}{2}}}{\sqrt{\arcsin(ax)}}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
[Out] integrate((-a^2*c*x^2 + c)^(3/2)/sqrt(arcsin(a*x)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(c-a^2cx^2)^{3/2}}{\sqrt{\arcsin(ax)}}\,dx = \int \frac{(c-a^2\,c\,x^2)^{3/2}}{\sqrt{\mathrm{asin}\,(a\,x)}}\,dx$$

```
[In] int((c - a^2*c*x^2)^(3/2)/asin(a*x)^(1/2),x)
[Out] int((c - a^2*c*x^2)^(3/2)/asin(a*x)^(1/2), x)
```

3.467 $\int \frac{\sqrt{c-a^2cx^2}}{\sqrt{\arcsin(ax)}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 99

$$\int \frac{\sqrt{c-a^2cx^2}}{\sqrt{\arcsin(ax)}}\,dx=\frac{\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{a\sqrt{1-a^2x^2}}+\frac{\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}}$$

```
[Out] 1/2*FresnelC(2*arcsin(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/
(-a^2*x^2+1)^(1/2)+(-a^2*c*x^2+c)^(1/2)*arcsin(a*x)^(1/2)/a/(-a^2*x^2+1)^(1
/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4753, 3393, 3385, 3433}

$$\int \frac{\sqrt{c-a^2cx^2}}{\sqrt{\arcsin(ax)}}\,dx=\frac{\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}}+\frac{\sqrt{\arcsin(ax)}\sqrt{c-a^2cx^2}}{a\sqrt{1-a^2x^2}}$$

```
[In] Int[Sqrt[c - a^2*c*x^2]/Sqrt[ArcSin[a*x]],x]
```

```
[Out] (Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])/(a*Sqrt[1 - a^2*x^2]) + (Sqrt[Pi]*S
qrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(2*a*Sqrt[1 -
a^2*x^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
```

```
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{c-a^2cx^2}\text{Subst}\left(\int \frac{\cos^2(x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= \frac{\sqrt{c-a^2cx^2}\text{Subst}\left(\int \left(\frac{1}{2\sqrt{x}}+\frac{\cos(2x)}{2\sqrt{x}}\right)\,dx,x,\arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= \frac{\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{a\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{2a\sqrt{1-a^2x^2}}\\
&= \frac{\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{a\sqrt{1-a^2x^2}}+\frac{\sqrt{c-a^2cx^2}\text{Subst}\left(\int \cos\left(2x^2\right)\,dx,x,\sqrt{\arcsin(ax)}\right)}{a\sqrt{1-a^2x^2}}\\
&= \frac{\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}{a\sqrt{1-a^2x^2}}+\frac{\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{2a\sqrt{1-a^2x^2}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.18 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.19

$$\int \frac{\sqrt{c-a^2cx^2}}{\sqrt{\arcsin(ax)}}\,dx$$
$$=\frac{\sqrt{c\left(1-a^2x^2\right)}\Big(8\arcsin(ax)-i\sqrt{2}\sqrt{-i\arcsin(ax)}\Gamma\left(\frac{1}{2},-2i\arcsin(ax)\right)+i\sqrt{2}\sqrt{i\arcsin(ax)}\Gamma\left(\frac{1}{2},2i\arcsin\right.}{8a\sqrt{1-a^2x^2}\sqrt{\arcsin(ax)}}$$

```
[In] Integrate[Sqrt[c - a^2*c*x^2]/Sqrt[ArcSin[a*x]],x]
[Out] (Sqrt[c*(1 - a^2*x^2)]*(8*ArcSin[a*x] - I*Sqrt[2]*Sqrt[(-I)*ArcSin[a*x]]*Ga
mma[1/2, (-2*I)*ArcSin[a*x]] + I*Sqrt[2]*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (2*
I)*ArcSin[a*x]]))/(8*a*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]])
```

Maple [F]

$$\int \frac{\sqrt{-a^{2} c \,x^{2}+c}}{\sqrt{\arcsin \left(a x \right)}}d x$$

```
[In] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x)
[Out] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\sqrt{c-a^2cx^2}}{\sqrt{\arcsin(ax)}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{\sqrt{c - a^2cx^2}}{\sqrt{\arcsin(ax)}}\,dx = \int \frac{\sqrt{-c\,(ax-1)\,(ax+1)}}{\sqrt{\operatorname{asin}\,(ax)}}\,dx$$

```
[In] integrate((-a**2*c*x**2+c)**(1/2)/asin(a*x)**(1/2),x)
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))/sqrt(asin(a*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{c - a^2cx^2}}{\sqrt{\arcsin(ax)}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{\sqrt{c - a^2cx^2}}{\sqrt{\arcsin(ax)}}\,dx = \int \frac{\sqrt{-a^2cx^2 + c}}{\sqrt{\arcsin\,(ax)}}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(-a^2*c*x^2 + c)/sqrt(arcsin(a*x)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{c - a^2cx^2}}{\sqrt{\arcsin(ax)}}\,dx = \int \frac{\sqrt{c - a^2\,c\,x^2}}{\sqrt{\operatorname{asin}\,(a\,x)}}\,dx$$

```
[In] int((c - a^2*c*x^2)^(1/2)/asin(a*x)^(1/2),x)
[Out] int((c - a^2*c*x^2)^(1/2)/asin(a*x)^(1/2), x)
```

3.468 $\int \frac{1}{\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 42

$$\int \frac{1}{\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}\,dx=\frac{2\sqrt{1-a^2x^2}\sqrt{\arcsin(ax)}}{a\sqrt{c-a^2cx^2}}$$

```
[Out] 2*(-a^2*x^2+1)^(1/2)*arcsin(a*x)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042, Rules used = {4737}

$$\int \frac{1}{\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}\,dx=\frac{2\sqrt{1-a^2x^2}\sqrt{\arcsin(ax)}}{a\sqrt{c-a^2cx^2}}$$

```
[In] Int[1/(Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]]),x]
[Out] (2*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]])/(a*Sqrt[c - a^2*c*x^2])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral}=\frac{2\sqrt{1-a^2x^2}\sqrt{\arcsin(ax)}}{a\sqrt{c-a^2cx^2}}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}\,dx=\frac{2\sqrt{1-a^2x^2}\sqrt{\arcsin(ax)}}{a\sqrt{c-a^2cx^2}}$$

```
[In] Integrate[1/(Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]]),x]
[Out] (2*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]])/(a*Sqrt[c - a^2*c*x^2])
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.90

method	result	size
default	$\frac{2\sqrt{\arcsin(ax)}\,\sqrt{-a^2x^2+1}}{a\sqrt{-c(a^2x^2-1)}}$	38

```
[In] int(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2*arcsin(a*x)^(1/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{1}{\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}\,dx=\int \frac{1}{\sqrt{-c\,(ax-1)\,(ax+1)}\sqrt{\operatorname{asin}\,(ax)}}\,dx$$

```
[In] integrate(1/(-a**2*c*x**2+c)**(1/2)/asin(a*x)**(1/2),x)
[Out] Integral(1/(sqrt(-c*(a*x - 1)*(a*x + 1))*sqrt(asin(a*x))), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{1}{\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}\,dx = \int \frac{1}{\sqrt{-a^2cx^2+c}\sqrt{\arcsin(ax)}}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-a^2*c*x^2 + c)*sqrt(arcsin(a*x))), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}\,dx = \int \frac{1}{\sqrt{\mathrm{asin}(a\,x)}\,\sqrt{c-a^2\,c\,x^2}}\,dx$$

```
[In] int(1/(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(1/(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(1/2)), x)
```

3.469 $\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}}\,dx = \text{Int}\left(\frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}},x\right)$$

```
[Out] Unintegrable(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}}\,dx = \int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}}\,dx$$

```
[In] Int[1/((c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]),x]
[Out] Defer[Int][1/((c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 2.20 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}}\,dx=\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}}\,dx$$

```
[In] Integrate[1/((c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]),x]
[Out] Integrate[1/((c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.21 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int \frac{1}{\left(-a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \sqrt{\arcsin \left(a x \right)}}d x$$

```
[In] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x)
[Out] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 6.19 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.12

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}}\,dx=\int \frac{1}{\left(-c\left(ax-1\right)\left(ax+1\right)\right)^{\frac{3}{2}}\sqrt{\operatorname{asin}\left(ax\right)}}\,dx$$

```
[In] integrate(1/(-a**2*c*x**2+c)**(3/2)/asin(a*x)**(1/2),x)
[Out] Integral(1/((-c*(a*x - 1)*(a*x + 1))**(3/2)*sqrt(asin(a*x))), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.50 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}}\,dx = \int \frac{1}{(-a^2cx^2+c)^{\frac{3}{2}}\sqrt{\arcsin(ax)}}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
[Out] integrate(1/((-a^2*c*x^2 + c)^(3/2)*sqrt(arcsin(a*x))), x)
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}}\,dx = \int \frac{1}{\sqrt{\mathrm{asin}\,(a\,x)}\,(c-a^2\,c\,x^2)^{3/2}}\,dx$$

```
[In] int(1/(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(3/2)),x)
[Out] int(1/(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(3/2)), x)
```

3.470 $\int \frac{1}{(c-a^2cx^2)^{5/2}\sqrt{\arcsin(ax)}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\sqrt{\arcsin(ax)}}\,dx = \mathrm{Int}\left(\frac{1}{(c-a^2cx^2)^{5/2}\sqrt{\arcsin(ax)}},x\right)$$

```
[Out] Unintegrable(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\sqrt{\arcsin(ax)}}\,dx = \int \frac{1}{(c-a^2cx^2)^{5/2}\sqrt{\arcsin(ax)}}\,dx$$

```
[In] Int[1/((c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]),x]
```

```
[Out] Defer[Int][1/((c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(c-a^2cx^2)^{5/2}\sqrt{\arcsin(ax)}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 2.60 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\sqrt{\arcsin(ax)}}\,dx=\int \frac{1}{(c-a^2cx^2)^{5/2}\sqrt{\arcsin(ax)}}\,dx$$

```
[In] Integrate[1/((c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]),x]
[Out] Integrate[1/((c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.27 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int \frac{1}{(-a^2c\,x^2+c)^{\frac{5}{2}}\sqrt{\arcsin\left(ax\right)}}dx$$

```
[In] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x)
[Out] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\sqrt{\arcsin(ax)}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 60.97 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.12

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\sqrt{\arcsin(ax)}}\,dx=\int \frac{1}{\left(-c\left(ax-1\right)\left(ax+1\right)\right)^{\frac{5}{2}}\sqrt{\operatorname{asin}\left(ax\right)}}\,dx$$

```
[In] integrate(1/(-a**2*c*x**2+c)**(5/2)/asin(a*x)**(1/2),x)
[Out] Integral(1/((-c*(a*x - 1)*(a*x + 1))**(5/2)*sqrt(asin(a*x))), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(c - a^2cx^2)^{5/2}\sqrt{\arcsin(ax)}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.52 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{1}{(c - a^2cx^2)^{5/2}\sqrt{\arcsin(ax)}}\,dx = \int \frac{1}{(-a^2cx^2 + c)^{\frac{5}{2}}\sqrt{\arcsin(ax)}}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2),x, algorithm="giac")
[Out] integrate(1/((-a^2*c*x^2 + c)^(5/2)*sqrt(arcsin(a*x))), x)
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{1}{(c - a^2cx^2)^{5/2}\sqrt{\arcsin(ax)}}\,dx = \int \frac{1}{\sqrt{\mathrm{asin}(a\,x)}\,(c - a^2\,c\,x^2)^{5/2}}\,dx$$

```
[In] int(1/(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(5/2)),x)
[Out] int(1/(asin(a*x)^(1/2)*(c - a^2*c*x^2)^(5/2)), x)
```

3.471 $\int \frac{(c-a^2cx^2)^{5/2}}{\arcsin(ax)^{3/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 237

$$\int \frac{(c-a^2cx^2)^{5/2}}{\arcsin(ax)^{3/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{5/2}}{a\sqrt{\arcsin(ax)}} - \frac{3c^2\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{2a\sqrt{1-a^2x^2}} - \frac{c^2\sqrt{3\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(2\sqrt{\frac{3}{\pi}}\sqrt{\arcsin(ax)}\right)}{8a\sqrt{1-a^2x^2}} - \frac{15c^2\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}$$

```
[Out] -3/4*c^2*FresnelS(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(-
a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-15/8*c^2*FresnelS(2*arcsin(a*x)^(1/
2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-1/8*c^2*Fre
snelS(2*3^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*3^(1/2)*Pi^(1/2)*(-a^2*c*x^2+c)
^(1/2)/a/(-a^2*x^2+1)^(1/2)-2*(-a^2*c*x^2+c)^(5/2)*(-a^2*x^2+1)^(1/2)/a/arc
sin(a*x)^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 237, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4751, 4809, 4491, 3386, 3432}

$$\int \frac{(c-a^2cx^2)^{5/2}}{\arcsin(ax)^{3/2}}\,dx = -\frac{3\sqrt{\frac{\pi}{2}}c^2\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{2a\sqrt{1-a^2x^2}} - \frac{\sqrt{3\pi}c^2\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(2\sqrt{\frac{3}{\pi}}\sqrt{\arcsin(ax)}\right)}{8a\sqrt{1-a^2x^2}} - \frac{15\sqrt{\pi}c^2\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}} - \frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{5/2}}{a\sqrt{\arcsin(ax)}}$$

```
[In] Int[(c - a^2*c*x^2)^(5/2)/ArcSin[a*x]^(3/2),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2]*(c - a^2*c*x^2)^(5/2))/(a*Sqrt[ArcSin[a*x]]) - (3*c^2
*Sqrt[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(
2*a*Sqrt[1 - a^2*x^2]) - (c^2*Sqrt[3*Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqr
t[3/Pi]*Sqrt[ArcSin[a*x]]])/(8*a*Sqrt[1 - a^2*x^2]) - (15*c^2*Sqrt[Pi]*Sqrt
[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(8*a*Sqrt[1 - a^2
*x^2])
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
```

```
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{5/2}}{a\sqrt{\arcsin(ax)}} - \frac{\left(12ac^2\sqrt{c-a^2cx^2}\right)\int \frac{x(1-a^2x^2)^2}{\sqrt{\arcsin(ax)}}\,dx}{\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{5/2}}{a\sqrt{\arcsin(ax)}} - \frac{\left(12c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos^5(x)\sin(x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{5/2}}{a\sqrt{\arcsin(ax)}} - \frac{\left(12c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \left(\frac{5\sin(2x)}{32\sqrt{x}} + \frac{\sin(4x)}{8\sqrt{x}} + \frac{\sin(6x)}{32\sqrt{x}}\right)\,dx, x, \arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{5/2}}{a\sqrt{\arcsin(ax)}} - \frac{\left(3c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\sin(6x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{8a\sqrt{1-a^2x^2}} - \frac{\left(3c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\sin(4x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{2a\sqrt{1-a^2x^2}} - \frac{\left(15c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx, x, \arcsin(ax)\right)}{8a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{5/2}}{a\sqrt{\arcsin(ax)}} - \frac{\left(3c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \sin\left(6x^2\right)\,dx, x, \sqrt{\arcsin(ax)}\right)}{4a\sqrt{1-a^2x^2}} - \frac{\left(3c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \sin\left(4x^2\right)\,dx, x, \sqrt{\arcsin(ax)}\right)}{a\sqrt{1-a^2x^2}} - \frac{\left(15c^2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \sin\left(2x^2\right)\,dx, x, \sqrt{\arcsin(ax)}\right)}{4a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{5/2}}{a\sqrt{\arcsin(ax)}} - \frac{3c^2\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{2a\sqrt{1-a^2x^2}}$$
$$- \frac{c^2\sqrt{3\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(2\sqrt{\frac{3}{\pi}}\sqrt{\arcsin(ax)}\right)}{8a\sqrt{1-a^2x^2}}$$
$$- \frac{15c^2\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{8a\sqrt{1-a^2x^2}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.85 (sec) , antiderivative size = 404, normalized size of antiderivative = 1.70

$$\int \frac{(c-a^2cx^2)^{5/2}}{\arcsin(ax)^{3/2}}\,dx =$$
$$-\frac{c^2e^{-6i\arcsin(ax)}\sqrt{c-a^2cx^2}\left(1+6e^{2i\arcsin(ax)}+15e^{4i\arcsin(ax)}+20e^{6i\arcsin(ax)}+15e^{8i\arcsin(ax)}+6e^{10i\arcsin(ax)}\right.}{}$$

```
[In] Integrate[(c - a^2*c*x^2)^(5/2)/ArcSin[a*x]^(3/2),x]
```

```
[Out] -1/32*(c^2*Sqrt[c - a^2*c*x^2]*(1 + 6*E^((2*I)*ArcSin[a*x]) + 15*E^((4*I)*A
rcSin[a*x]) + 20*E^((6*I)*ArcSin[a*x]) + 15*E^((8*I)*ArcSin[a*x]) + 6*E^((1
0*I)*ArcSin[a*x]) + E^((12*I)*ArcSin[a*x]) + 64*E^((6*I)*ArcSin[a*x])*Sqrt[
Pi]*Sqrt[ArcSin[a*x]]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]] + Sqrt[2]*E^
((6*I)*ArcSin[a*x])*Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (-2*I)*ArcSin[a*x]] +
 Sqrt[2]*E^((6*I)*ArcSin[a*x])*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (2*I)*ArcSin[
a*x]] - 12*E^((6*I)*ArcSin[a*x])*Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (-4*I)*A
rcSin[a*x]] - 12*E^((6*I)*ArcSin[a*x])*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (4*I)
*ArcSin[a*x]] - Sqrt[6]*E^((6*I)*ArcSin[a*x])*Sqrt[(-I)*ArcSin[a*x]]*Gamma[
1/2, (-6*I)*ArcSin[a*x]] - Sqrt[6]*E^((6*I)*ArcSin[a*x])*Sqrt[I*ArcSin[a*x]
]*Gamma[1/2, (6*I)*ArcSin[a*x]]))/(a*E^((6*I)*ArcSin[a*x])*Sqrt[1 - a^2*x^2
]*Sqrt[ArcSin[a*x]])
```

Maple [F]

$$\int \frac{(-a^2c\,x^2+c)^{\frac{5}{2}}}{\arcsin(ax)^{\frac{3}{2}}}dx$$

```
[In] int((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(c-a^2cx^2)^{5/2}}{\arcsin(ax)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(c-a^2cx^2)^{5/2}}{\arcsin(ax)^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate((-a**2*c*x**2+c)**(5/2)/asin(a*x)**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(c-a^2cx^2)^{5/2}}{\arcsin(ax)^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{(c-a^2cx^2)^{5/2}}{\arcsin(ax)^{3/2}}\,dx = \int \frac{(-a^2cx^2+c)^{\frac{5}{2}}}{\arcsin(ax)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((-a^2*c*x^2 + c)^(5/2)/arcsin(a*x)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(c-a^2cx^2)^{5/2}}{\arcsin(ax)^{3/2}}\,dx = \int \frac{{\left(c-a^2\,c\,x^2\right)}^{5/2}}{{\mathrm{asin}\left(a\,x\right)}^{3/2}} \,d x$$

```
[In] int((c - a^2*c*x^2)^(5/2)/asin(a*x)^(3/2),x)
[Out] int((c - a^2*c*x^2)^(5/2)/asin(a*x)^(3/2), x)
```

3.472 $\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{3/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 163

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{3/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{a\sqrt{\arcsin(ax)}} - \frac{c\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{a\sqrt{1-a^2x^2}} - \frac{2c\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}}$$

```
[Out] -1/2*c*FresnelS(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(-a^
2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-2*c*FresnelS(2*arcsin(a*x)^(1/2)/Pi^(
1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)-2*(-a^2*c*x^2+c)^(
3/2)*(-a^2*x^2+1)^(1/2)/a/arcsin(a*x)^(1/2)
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4751, 4809, 4491, 3386, 3432}

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{3/2}}\,dx = -\frac{\sqrt{\frac{\pi}{2}}c\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{a\sqrt{1-a^2x^2}} - \frac{2\sqrt{\pi}c\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}} - \frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{a\sqrt{\arcsin(ax)}}$$

```
[In] Int[(c - a^2*c*x^2)^(3/2)/ArcSin[a*x]^(3/2),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2]*(c - a^2*c*x^2)^(3/2))/(a*Sqrt[ArcSin[a*x]]) - (c*Sqr
t[Pi/2]*Sqrt[c - a^2*c*x^2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(a*Sq
rt[1 - a^2*x^2]) - (2*c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSi
n[a*x]])/Sqrt[Pi]])/(a*Sqrt[1 - a^2*x^2])
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{a\sqrt{\arcsin(ax)}} - \frac{\left(8ac\sqrt{c-a^2cx^2}\right)\int \frac{x(1-a^2x^2)}{\sqrt{\arcsin(ax)}}\,dx}{\sqrt{1-a^2x^2}}$$

$$=-\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{a\sqrt{\arcsin(ax)}}-\frac{\left(8c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\cos^3(x)\sin(x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$=-\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{a\sqrt{\arcsin(ax)}}-\frac{\left(8c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\left(\frac{\sin(2x)}{4\sqrt{x}}+\frac{\sin(4x)}{8\sqrt{x}}\right)\,dx,x,\arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$=-\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{a\sqrt{\arcsin(ax)}}-\frac{\left(c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\sin(4x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}-\frac{\left(2c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\sin(2x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}$$

$$=-\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{a\sqrt{\arcsin(ax)}}-\frac{\left(2c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\sin\left(4x^2\right)\,dx,x,\sqrt{\arcsin(ax)}\right)}{a\sqrt{1-a^2x^2}}-\frac{\left(4c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\sin\left(2x^2\right)\,dx,x,\sqrt{\arcsin(ax)}\right)}{a\sqrt{1-a^2x^2}}$$

$$=-\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{a\sqrt{\arcsin(ax)}}-\frac{c\sqrt{\frac{\pi}{2}}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{a\sqrt{1-a^2x^2}}-\frac{2c\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.38 (sec) , antiderivative size = 211, normalized size of antiderivative = 1.29

$$\int\frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{3/2}}\,dx=$$

$$-\frac{ce^{-4i\arcsin(ax)}\sqrt{c-a^2cx^2}\left(1+6e^{4i\arcsin(ax)}+e^{8i\arcsin(ax)}+8e^{4i\arcsin(ax)}\cos(2\arcsin(ax))+16e^{4i\arcsin(ax)}\sqrt{\pi}\right.}{}$$

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)/ArcSin[a*x]^(3/2),x]
```

```
[Out] -1/8*(c*Sqrt[c - a^2*c*x^2]*(1 + 6*E^((4*I)*ArcSin[a*x]) + E^((8*I)*ArcSin[
a*x]) + 8*E^((4*I)*ArcSin[a*x])*Cos[2*ArcSin[a*x]] + 16*E^((4*I)*ArcSin[a*x
])*Sqrt[Pi]*Sqrt[ArcSin[a*x]]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]] - 2*
E^((4*I)*ArcSin[a*x])*Sqrt[(-I)*ArcSin[a*x]]*Gamma[1/2, (-4*I)*ArcSin[a*x]]
 - 2*E^((4*I)*ArcSin[a*x])*Sqrt[I*ArcSin[a*x]]*Gamma[1/2, (4*I)*ArcSin[a*x]
]))/(a*E^((4*I)*ArcSin[a*x])*Sqrt[1 - a^2*x^2]*Sqrt[ArcSin[a*x]])
```

Maple [F]

$$\int \frac{(-a^2 c\,x^2+c)^{\frac{3}{2}}}{\arcsin(ax)^{\frac{3}{2}}}dx$$

```
[In] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x)
[Out] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{3/2}}\,dx = \int \frac{(-c(ax-1)\,(ax+1))^{\frac{3}{2}}}{\operatorname{asin}^{\frac{3}{2}}(ax)}\,dx$$

```
[In] integrate((-a**2*c*x**2+c)**(3/2)/asin(a*x)**(3/2),x)
[Out] Integral((-c*(a*x - 1)*(a*x + 1))**(3/2)/asin(a*x)**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{3/2}}\,dx = \int \frac{(-a^2cx^2+c)^{\frac{3}{2}}}{\arcsin(ax)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
[Out] integrate((-a^2*c*x^2 + c)^(3/2)/arcsin(a*x)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{3/2}}\,dx = \int \frac{(c-a^2\,c\,x^2)^{3/2}}{\mathrm{asin}\left(a\,x\right)^{3/2}}\,dx$$

```
[In] int((c - a^2*c*x^2)^(3/2)/asin(a*x)^(3/2),x)
[Out] int((c - a^2*c*x^2)^(3/2)/asin(a*x)^(3/2), x)
```

3.473 $\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{3/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 98

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{3/2}}\,dx=-\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\arcsin(ax)}}-\frac{2\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}}$$

```
[Out] -2*FresnelS(2*arcsin(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(
-a^2*x^2+1)^(1/2)-2*(-a^2*c*x^2+c)^(1/2)*(-a^2*x^2+1)^(1/2)/a/arcsin(a*x)^(
1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4751, 4731, 4491, 12, 3386, 3432}

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{3/2}}\,dx=-\frac{2\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}}-\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\arcsin(ax)}}$$

```
[In] Int[Sqrt[c - a^2*c*x^2]/ArcSin[a*x]^(3/2),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2])/(a*Sqrt[ArcSin[a*x]]) - (2*Sqrt[
Pi]*Sqrt[c - a^2*c*x^2]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(a*Sqrt[1
 - a^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\arcsin(ax)}}-\frac{\left(4a\sqrt{c-a^2cx^2}\right)\int\frac{x}{\sqrt{\arcsin(ax)}}\,dx}{\sqrt{1-a^2x^2}}\\
&= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\arcsin(ax)}}-\frac{\left(4\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\arcsin(ax)}}-\frac{\left(4\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\sin(2x)}{2\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}\\
&= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\arcsin(ax)}}-\frac{\left(2\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\sin(2x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{a\sqrt{1-a^2x^2}}
\end{aligned}$$

$$= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\arcsin(ax)}} - \frac{\left(4\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \sin\left(2x^2\right)\,dx, x, \sqrt{\arcsin(ax)}\right)}{a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{a\sqrt{\arcsin(ax)}} - \frac{2\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{a\sqrt{1-a^2x^2}}$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.85

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{3/2}}\,dx = -\frac{\sqrt{c(1-a^2x^2)}\left(1+\cos(2\arcsin(ax))+2\sqrt{\pi}\sqrt{\arcsin(ax)}\,\text{FresnelS}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)\right)}{a\sqrt{1-a^2x^2}\sqrt{\arcsin(ax)}}$$

```
[In] Integrate[Sqrt[c - a^2*c*x^2]/ArcSin[a*x]^(3/2),x]
[Out] -((Sqrt[c*(1 - a^2*x^2)]*(1 + Cos[2*ArcSin[a*x]] + 2*Sqrt[Pi]*Sqrt[ArcSin[a
*x]]*FresnelS[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]]))/(a*Sqrt[1 - a^2*x^2]*Sqrt[A
rcSin[a*x]]))
```

Maple [F]

$$\int \frac{\sqrt{-a^2c\,x^2+c}}{\arcsin\left(ax\right)^{\frac{3}{2}}}dx$$

```
[In] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x)
[Out] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{3/2}}\,dx = \int \frac{\sqrt{-c\,(ax-1)\,(ax+1)}}{\operatorname{asin}^{\frac{3}{2}}(ax)}\,dx$$

```
[In] integrate((-a**2*c*x**2+c)**(1/2)/asin(a*x)**(3/2),x)
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))/asin(a*x)**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{3/2}}\,dx = \int \frac{\sqrt{-a^2cx^2+c}}{\arcsin(ax)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
[Out] integrate(sqrt(-a^2*c*x^2 + c)/arcsin(a*x)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{3/2}}\,dx = \int \frac{\sqrt{c-a^2\,c\,x^2}}{\operatorname{asin}(a\,x)^{3/2}}\,dx$$

```
[In] int((c - a^2*c*x^2)^(1/2)/asin(a*x)^(3/2),x)
[Out] int((c - a^2*c*x^2)^(1/2)/asin(a*x)^(3/2), x)
```

3.474 $\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 42

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}\,dx=-\frac{2\sqrt{1-a^2x^2}}{a\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}$$

```
[Out] -2*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042, Rules used = {4737}

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}\,dx=-\frac{2\sqrt{1-a^2x^2}}{a\sqrt{\arcsin(ax)}\sqrt{c-a^2cx^2}}$$

```
[In] Int[1/(Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2)),x]
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral}=-\frac{2\sqrt{1-a^2x^2}}{a\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}}{a\sqrt{c-a^2cx^2}\sqrt{\arcsin(ax)}}$$

```
[In] Integrate[1/(Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2)),x]
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*Sqrt[c - a^2*c*x^2]*Sqrt[ArcSin[a*x]])
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.90

method	result	size
default	$-\frac{2\sqrt{-a^2x^2+1}}{\sqrt{\arcsin(ax)}\,a\sqrt{-c(a^2x^2-1)}}$	38

```
[In] int(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x,method=_RETURNVERBOSE)
[Out] -2/arcsin(a*x)^(1/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.14

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}\,dx = \frac{2\sqrt{-a^2cx^2+c}\sqrt{-a^2x^2+1}}{(a^3cx^2-ac)\sqrt{\arcsin(ax)}}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
[Out] 2*sqrt(-a^2*c*x^2 + c)*sqrt(-a^2*x^2 + 1)/((a^3*c*x^2 - a*c)*sqrt(arcsin(a*
x)))
```

Sympy [F]

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}\,dx = \int \frac{1}{\sqrt{-c(ax-1)(ax+1)}\operatorname{asin}^{\frac{3}{2}}(ax)}\,dx$$

```
[In] integrate(1/(-a**2*c*x**2+c)**(1/2)/asin(a*x)**(3/2),x)
[Out] Integral(1/(sqrt(-c*(a*x - 1)*(a*x + 1))*asin(a*x)**(3/2)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}\,dx = \int \frac{1}{\sqrt{-a^2cx^2+c}\arcsin(ax)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}\,dx = \int \frac{1}{\operatorname{asin}(a\,x)^{3/2}\,\sqrt{c-a^2\,c\,x^2}}\,dx$$

```
[In] int(1/(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(1/2)),x)
[Out] int(1/(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(1/2)), x)
```

3.475 $\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}}{a(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}} + \frac{4a\sqrt{1-a^2x^2}\mathrm{Int}\left(\frac{x}{(1-a^2x^2)^2\sqrt{\arcsin(ax)}},x\right)}{c\sqrt{c-a^2cx^2}}$$

```
[Out] -2*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(1/2)+4*a*(-a^2*x^
2+1)^(1/2)*Unintegrable(x/(-a^2*x^2+1)^2/arcsin(a*x)^(1/2),x)/c/(-a^2*c*x^2
+c)^(1/2)
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}}\,dx = \int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}}\,dx$$

```
[In] Int[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*(c - a^2*c*x^2)^(3/2)*Sqrt[ArcSin[a*x]]) + (4*a*S
qrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*x^2)^2*Sqrt[ArcSin[a*x]]), x])/(c*S
qrt[c - a^2*c*x^2])
```

Rubi steps

$$\text{integral} = -\frac{2\sqrt{1-a^2x^2}}{a(c-a^2cx^2)^{3/2}\sqrt{\arcsin(ax)}} + \frac{\left(4a\sqrt{1-a^2x^2}\right)\int \frac{x}{(1-a^2x^2)^2\sqrt{\arcsin(ax)}}\,dx}{c\sqrt{c-a^2cx^2}}$$

Mathematica [N/A]

Not integrable

Time = 2.46 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}}\,dx=\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}}\,dx$$

```
[In] Integrate[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2)),x]
[Out] Integrate[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2)), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.22 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int \frac{1}{\left(-a^{2} c\,x^{2}+c\right)^{\frac{3}{2}} \arcsin\left(a x\right)^{\frac{3}{2}}}d x$$

```
[In] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x)
[Out] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 39.65 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.12

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}}\,dx=\int \frac{1}{\left(-c\left(ax-1\right)\left(ax+1\right)\right)^{\frac{3}{2}}\operatorname{asin}^{\frac{3}{2}}\left(ax\right)}\,dx$$

```
[In] integrate(1/(-a**2*c*x**2+c)**(3/2)/asin(a*x)**(3/2),x)
[Out] Integral(1/((-c*(a*x - 1)*(a*x + 1))**(3/2)*asin(a*x)**(3/2)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.55 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}}\,dx = \int \frac{1}{(-a^2cx^2+c)^{\frac{3}{2}}\arcsin(ax)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(1/((-a^2*c*x^2 + c)^(3/2)*arcsin(a*x)^(3/2)), x)
```

Mupad [N/A]

Not integrable

Time = 0.14 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}}\,dx = \int \frac{1}{\mathrm{asin}(a\,x)^{3/2}\,(c-a^2\,c\,x^2)^{3/2}}\,dx$$

```
[In] int(1/(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(3/2)), x)
```

3.476 $\int \frac{1}{\left(c-a^2cx^2\right)^{5/2}\arcsin(ax)^{3/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{3/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}}{a\,(c-a^2cx^2)^{5/2}\,\sqrt{\arcsin(ax)}} + \frac{8a\sqrt{1-a^2x^2}\,\mathrm{Int}\left(\frac{x}{(1-a^2x^2)^3\sqrt{\arcsin(ax)}},x\right)}{c^2\sqrt{c-a^2cx^2}}$$

```
[Out] -2*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(1/2)+8*a*(-a^2*x^
2+1)^(1/2)*Unintegrable(x/(-a^2*x^2+1)^3/arcsin(a*x)^(1/2),x)/c^2/(-a^2*c*x
^2+c)^(1/2)
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{3/2}}\,dx = \int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{3/2}}\,dx$$

```
[In] Int[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(3/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(a*(c - a^2*c*x^2)^(5/2)*Sqrt[ArcSin[a*x]]) + (8*a*S
qrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*x^2)^3*Sqrt[ArcSin[a*x]]), x])/(c^2
*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\text{integral} = -\frac{2\sqrt{1-a^2x^2}}{a\,(c-a^2cx^2)^{5/2}\,\sqrt{\arcsin(ax)}} + \frac{\left(8a\sqrt{1-a^2x^2}\right)\int \frac{x}{(1-a^2x^2)^3\sqrt{\arcsin(ax)}}\,dx}{c^2\sqrt{c-a^2cx^2}}$$

Mathematica [N/A]

Not integrable

Time = 2.48 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{3/2}}\,dx = \int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{3/2}}\,dx$$

```
[In] Integrate[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(3/2)),x]
[Out] Integrate[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(3/2)), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.28 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int \frac{1}{\left(-a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \arcsin \left(a x \right)^{\frac{3}{2}}}d x$$

```
[In] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x)
[Out] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(1/(-a**2*c*x**2+c)**(5/2)/asin(a*x)**(3/2),x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.57 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{3/2}}\,dx = \int \frac{1}{(-a^2cx^2+c)^{\frac{5}{2}}\arcsin{(ax)}^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(1/((-a^2*c*x^2 + c)^(5/2)*arcsin(a*x)^(3/2)), x)
```

Mupad [N/A]

Not integrable

Time = 0.14 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{3/2}}\,dx = \int \frac{1}{\mathrm{asin}\left(a\,x\right)^{3/2}\,{\left(c-a^2\,c\,x^2\right)}^{5/2}}\,dx$$

```
[In] int(1/(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(asin(a*x)^(3/2)*(c - a^2*c*x^2)^(5/2)), x)
```

3.477 $\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{5/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 206

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{5/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{3a\arcsin(ax)^{3/2}} + \frac{16cx(1-a^2x^2)\sqrt{c-a^2cx^2}}{3\sqrt{\arcsin(ax)}} - \frac{4c\sqrt{2\pi}\sqrt{c-a^2cx^2}\,\mathrm{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{3a\sqrt{1-a^2x^2}} - \frac{8c\sqrt{\pi}\sqrt{c-a^2cx^2}\,\mathrm{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}}$$

```
[Out] -2/3*(-a^2*c*x^2+c)^(3/2)*(-a^2*x^2+1)^(1/2)/a/arcsin(a*x)^(3/2)-8/3*c*Fres
nelC(2*arcsin(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^
2+1)^(1/2)-4/3*c*FresnelC(2*2^(1/2)/Pi^(1/2)*arcsin(a*x)^(1/2))*2^(1/2)*Pi^
(1/2)*(-a^2*c*x^2+c)^(1/2)/a/(-a^2*x^2+1)^(1/2)+16/3*c*x*(-a^2*x^2+1)*(-a^2
*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2)
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used

$= \{4751, 4799, 4753, 3393, 3385, 3433, 4809, 4491\}$

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{5/2}}\,dx = -\frac{4\sqrt{2\pi}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{3a\sqrt{1-a^2x^2}} - \frac{8\sqrt{\pi}c\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}} - \frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{3a\arcsin(ax)^{3/2}} + \frac{16cx(1-a^2x^2)\sqrt{c-a^2cx^2}}{3\sqrt{\arcsin(ax)}}$$

```
[In] Int[(c - a^2*c*x^2)^(3/2)/ArcSin[a*x]^(5/2),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2]*(c - a^2*c*x^2)^(3/2))/(3*a*ArcSin[a*x]^(3/2)) + (16*
c*x*(1 - a^2*x^2)*Sqrt[c - a^2*c*x^2])/(3*Sqrt[ArcSin[a*x]]) - (4*c*Sqrt[2*
Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcSin[a*x]]])/(3*a*Sqrt
[1 - a^2*x^2]) - (8*c*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]*FresnelC[(2*Sqrt[ArcSin[
a*x]])/Sqrt[Pi]])/(3*a*Sqrt[1 - a^2*x^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
```

```
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rule 4799

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Dist[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p -
 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Dist[c*((m + 2*p + 1)/(b*f*(n +
 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^
(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
 x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1,
0] && IGtQ[m, -3]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{3a\arcsin(ax)^{3/2}}-\frac{\left(8ac\sqrt{c-a^2cx^2}\right)\int\frac{x(1-a^2x^2)}{\arcsin(ax)^{3/2}}\,dx}{3\sqrt{1-a^2x^2}}\\
&= -\frac{2\sqrt{1-a^2x^2}\left(c-a^2cx^2\right)^{3/2}}{3a\arcsin(ax)^{3/2}}+\frac{16cx(1-a^2x^2)\sqrt{c-a^2cx^2}}{3\sqrt{\arcsin(ax)}}\\
&\quad-\frac{\left(16c\sqrt{c-a^2cx^2}\right)\int\frac{\sqrt{1-a^2x^2}}{\sqrt{\arcsin(ax)}}\,dx}{3\sqrt{1-a^2x^2}}+\frac{\left(64a^2c\sqrt{c-a^2cx^2}\right)\int\frac{x^2\sqrt{1-a^2x^2}}{\sqrt{\arcsin(ax)}}\,dx}{3\sqrt{1-a^2x^2}}
\end{aligned}$$

$$= -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{3a\arcsin(ax)^{3/2}} + \frac{16cx(1-a^2x^2)\sqrt{c-a^2cx^2}}{3\sqrt{\arcsin(ax)}} - \frac{\left(16c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\cos^2(x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{3a\sqrt{1-a^2x^2}} + \frac{\left(64c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\cos^2(x)\sin^2(x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{3a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{3a\arcsin(ax)^{3/2}} + \frac{16cx(1-a^2x^2)\sqrt{c-a^2cx^2}}{3\sqrt{\arcsin(ax)}} - \frac{\left(16c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\left(\frac{1}{2\sqrt{x}}+\frac{\cos(2x)}{2\sqrt{x}}\right)\,dx,x,\arcsin(ax)\right)}{3a\sqrt{1-a^2x^2}} + \frac{\left(64c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\left(\frac{1}{8\sqrt{x}}-\frac{\cos(4x)}{8\sqrt{x}}\right)\,dx,x,\arcsin(ax)\right)}{3a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{3a\arcsin(ax)^{3/2}} + \frac{16cx(1-a^2x^2)\sqrt{c-a^2cx^2}}{3\sqrt{\arcsin(ax)}} - \frac{\left(8c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\cos(2x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{3a\sqrt{1-a^2x^2}} - \frac{\left(8c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\frac{\cos(4x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{3a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{3a\arcsin(ax)^{3/2}} + \frac{16cx(1-a^2x^2)\sqrt{c-a^2cx^2}}{3\sqrt{\arcsin(ax)}} - \frac{\left(16c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\cos\left(2x^2\right)\,dx,x,\sqrt{\arcsin(ax)}\right)}{3a\sqrt{1-a^2x^2}} - \frac{\left(16c\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int\cos\left(4x^2\right)\,dx,x,\sqrt{\arcsin(ax)}\right)}{3a\sqrt{1-a^2x^2}}$$

$$= -\frac{2\sqrt{1-a^2x^2}(c-a^2cx^2)^{3/2}}{3a\arcsin(ax)^{3/2}} + \frac{16cx(1-a^2x^2)\sqrt{c-a^2cx^2}}{3\sqrt{\arcsin(ax)}} - \frac{4c\sqrt{2\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\arcsin(ax)}\right)}{3a\sqrt{1-a^2x^2}} - \frac{8c\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.05 (sec) , antiderivative size = 251, normalized size of antiderivative = 1.22

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{5/2}}\,dx = \frac{c\sqrt{c-a^2cx^2}\left(-14-e^{-4i\arcsin(ax)}-e^{4i\arcsin(ax)}+16a^2x^2+8ie^{-4i\arcsin(ax)}\arcsin(ax)-\right.}{}$$

```
[In] Integrate[(c - a^2*c*x^2)^(3/2)/ArcSin[a*x]^(5/2),x]
```

```
[Out] (c*Sqrt[c - a^2*c*x^2]*(-14 - E^((-4*I)*ArcSin[a*x]) - E^((4*I)*ArcSin[a*x]
) + 16*a^2*x^2 + ((8*I)*ArcSin[a*x])/E^((4*I)*ArcSin[a*x]) - (8*I)*E^((4*I)
*ArcSin[a*x])*ArcSin[a*x] + 64*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x] - 16*Sqrt[
2]*((-I)*ArcSin[a*x])^(3/2)*Gamma[1/2, (-2*I)*ArcSin[a*x]] - 16*Sqrt[2]*(I*
ArcSin[a*x])^(3/2)*Gamma[1/2, (2*I)*ArcSin[a*x]] - 16*((-I)*ArcSin[a*x])^(3
/2)*Gamma[1/2, (-4*I)*ArcSin[a*x]] - 16*(I*ArcSin[a*x])^(3/2)*Gamma[1/2, (4
*I)*ArcSin[a*x]]))/(24*a*Sqrt[1 - a^2*x^2]*ArcSin[a*x]^(3/2))
```

Maple [F]

$$\int \frac{(-a^2c\,x^2+c)^{\frac{3}{2}}}{\arcsin(ax)^{\frac{5}{2}}}dx$$

```
[In] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{5/2}}\,dx = \int \frac{(-c(ax-1)\,(ax+1))^{\frac{3}{2}}}{\operatorname{asin}^{\frac{5}{2}}(ax)}\,dx$$

```
[In] integrate((-a**2*c*x**2+c)**(3/2)/asin(a*x)**(5/2),x)
[Out] Integral((-c*(a*x - 1)*(a*x + 1))**(3/2)/asin(a*x)**(5/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{5/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{5/2}}\,dx = \int \frac{(-a^2cx^2+c)^{\frac{3}{2}}}{\arcsin(ax)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
[Out] integrate((-a^2*c*x^2 + c)^(3/2)/arcsin(a*x)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(c-a^2cx^2)^{3/2}}{\arcsin(ax)^{5/2}}\,dx = \int \frac{(c-a^2\,c\,x^2)^{3/2}}{\operatorname{asin}(a\,x)^{5/2}}\,dx$$

```
[In] int((c - a^2*c*x^2)^(3/2)/asin(a*x)^(5/2),x)
[Out] int((c - a^2*c*x^2)^(3/2)/asin(a*x)^(5/2), x)
```

3.478 $\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{5/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 130

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{5/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{3a\arcsin(ax)^{3/2}} + \frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\arcsin(ax)}} - \frac{8\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}}$$

```
[Out] -8/3*FresnelC(2*arcsin(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)*(-a^2*c*x^2+c)^(1/2)/a
/(-a^2*x^2+1)^(1/2)-2/3*(-a^2*c*x^2+c)^(1/2)*(-a^2*x^2+1)^(1/2)/a/arcsin(a*
x)^(3/2)+8/3*x*(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(1/2)
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4751, 4727, 3385, 3433}

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{5/2}}\,dx = -\frac{8\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}} + \frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\arcsin(ax)}} - \frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{3a\arcsin(ax)^{3/2}}$$

```
[In] Int[Sqrt[c - a^2*c*x^2]/ArcSin[a*x]^(5/2),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2]*Sqrt[c - a^2*c*x^2])/(3*a*ArcSin[a*x]^(3/2)) + (8*x*S
qrt[c - a^2*c*x^2])/(3*Sqrt[ArcSin[a*x]]) - (8*Sqrt[Pi]*Sqrt[c - a^2*c*x^2]
*FresnelC[(2*Sqrt[ArcSin[a*x]])/Sqrt[Pi]])/(3*a*Sqrt[1 - a^2*x^2])
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4751

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Dist[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p], Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{3a\arcsin(ax)^{3/2}}-\frac{\left(4a\sqrt{c-a^2cx^2}\right)\int \frac{x}{\arcsin(ax)^{3/2}}\,dx}{3\sqrt{1-a^2x^2}}\\
&= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{3a\arcsin(ax)^{3/2}}+\frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\arcsin(ax)}}\\
&\quad -\frac{\left(8\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}\,dx,x,\arcsin(ax)\right)}{3a\sqrt{1-a^2x^2}}\\
&= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{3a\arcsin(ax)^{3/2}}+\frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\arcsin(ax)}}\\
&\quad -\frac{\left(16\sqrt{c-a^2cx^2}\right)\text{Subst}\left(\int \cos\left(2x^2\right)\,dx,x,\sqrt{\arcsin(ax)}\right)}{3a\sqrt{1-a^2x^2}}\\
&= -\frac{2\sqrt{1-a^2x^2}\sqrt{c-a^2cx^2}}{3a\arcsin(ax)^{3/2}}+\frac{8x\sqrt{c-a^2cx^2}}{3\sqrt{\arcsin(ax)}}-\frac{8\sqrt{\pi}\sqrt{c-a^2cx^2}\,\text{FresnelC}\left(\frac{2\sqrt{\arcsin(ax)}}{\sqrt{\pi}}\right)}{3a\sqrt{1-a^2x^2}}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.43 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.09

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{5/2}}\,dx = \frac{2\sqrt{c-a^2cx^2}\left(-1+a^2x^2+4ax\sqrt{1-a^2x^2}\arcsin(ax)-\sqrt{2}(-i\arcsin(ax))^{3/2}\Gamma\left(\frac{1}{2},-2i\,a\right.}{3a\sqrt{1-a^2x^2}\arcsin(ax)^{3/2}}$$

```
[In] Integrate[Sqrt[c - a^2*c*x^2]/ArcSin[a*x]^(5/2),x]
```

```
[Out] (2*Sqrt[c - a^2*c*x^2]*(-1 + a^2*x^2 + 4*a*x*Sqrt[1 - a^2*x^2]*ArcSin[a*x]
- Sqrt[2]*((-I)*ArcSin[a*x])^(3/2)*Gamma[1/2, (-2*I)*ArcSin[a*x]] + (Sqrt[2
]*ArcSin[a*x]^2*Gamma[1/2, (2*I)*ArcSin[a*x]])/Sqrt[I*ArcSin[a*x]]))/(3*a*S
qrt[1 - a^2*x^2]*ArcSin[a*x]^(3/2))
```

Maple [F]

$$\int \frac{\sqrt{-a^2c\,x^2+c}}{\arcsin\left(ax\right)^{\frac{5}{2}}}dx$$

```
[In] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x)
```

```
[Out] int((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{5/2}}\,dx = \int \frac{\sqrt{-c\,(ax-1)\,(ax+1)}}{\operatorname{asin}^{\frac{5}{2}}(ax)}\,dx$$

```
[In] integrate((-a**2*c*x**2+c)**(1/2)/asin(a*x)**(5/2),x)
[Out] Integral(sqrt(-c*(a*x - 1)*(a*x + 1))/asin(a*x)**(5/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{5/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{5/2}}\,dx = \int \frac{\sqrt{-a^2cx^2+c}}{\arcsin(ax)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
[Out] integrate(sqrt(-a^2*c*x^2 + c)/arcsin(a*x)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{c-a^2cx^2}}{\arcsin(ax)^{5/2}}\,dx = \int \frac{\sqrt{c-a^2\,c\,x^2}}{\operatorname{asin}(a\,x)^{5/2}}\,dx$$

```
[In] int((c - a^2*c*x^2)^(1/2)/asin(a*x)^(5/2),x)
[Out] int((c - a^2*c*x^2)^(1/2)/asin(a*x)^(5/2), x)
```

3.479 $\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 44

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}\,dx=-\frac{2\sqrt{1-a^2x^2}}{3a\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}$$

```
[Out] -2/3*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(3/2)
```

Rubi [A] (verified)

Time = 0.03 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042, Rules used = {4737}

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}\,dx=-\frac{2\sqrt{1-a^2x^2}}{3a\arcsin(ax)^{3/2}\sqrt{c-a^2cx^2}}$$

```
[In] Int[1/(Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral}=-\frac{2\sqrt{1-a^2x^2}}{3a\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}\,dx=-\frac{2\sqrt{1-a^2x^2}}{3a\sqrt{c-a^2cx^2}\arcsin(ax)^{3/2}}$$

```
[In] Integrate[1/(Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(5/2)),x]
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*Sqrt[c - a^2*c*x^2]*ArcSin[a*x]^(3/2))
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.86

method	result	size
default	$-\frac{2\sqrt{-a^2x^2+1}}{3\arcsin(ax)^{\frac{3}{2}}a\sqrt{-c(a^2x^2-1)}}$	38

```
[In] int(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x,method=_RETURNVERBOSE)
[Out] -2/3/arcsin(a*x)^(3/2)/a/(-c*(a^2*x^2-1))^(1/2)*(-a^2*x^2+1)^(1/2)
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.09

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}\,dx=\frac{2\sqrt{-a^2cx^2+c}\sqrt{-a^2x^2+1}}{3\,(a^3cx^2-ac)\arcsin\left(ax\right)^{\frac{3}{2}}}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
[Out] 2/3*sqrt(-a^2*c*x^2 + c)*sqrt(-a^2*x^2 + 1)/((a^3*c*x^2 - a*c)*arcsin(a*x)^
(3/2))
```

Sympy [F]

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}\,dx = \int \frac{1}{\sqrt{-c\,(ax-1)\,(ax+1)}\,\operatorname{asin}^{\frac{5}{2}}\,(ax)}\,dx$$

```
[In] integrate(1/(-a**2*c*x**2+c)**(1/2)/asin(a*x)**(5/2),x)
[Out] Integral(1/(sqrt(-c*(a*x - 1)*(a*x + 1))*asin(a*x)**(5/2)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}\,dx = \int \frac{1}{\sqrt{-a^2cx^2+c}\arcsin\,(ax)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(1/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
[Out] integrate(1/(sqrt(-a^2*c*x^2 + c)*arcsin(a*x)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{c-a^2cx^2}\arcsin(ax)^{5/2}}\,dx = \int \frac{1}{\operatorname{asin}\,(a\,x)^{5/2}\,\sqrt{c-a^2\,c\,x^2}}\,dx$$

```
[In] int(1/(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(1/2)),x)
[Out] int(1/(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(1/2)), x)
```

3.480 $\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{5/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{5/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}}{3a\,(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}} + \frac{4a\sqrt{1-a^2x^2}\,\mathrm{Int}\left(\frac{x}{(1-a^2x^2)^2\arcsin(ax)^{3/2}},x\right)}{3c\sqrt{c-a^2cx^2}}$$

```
[Out] -2/3*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(3/2)+4/3*a*(-a^
2*x^2+1)^(1/2)*Unintegrable(x/(-a^2*x^2+1)^2/arcsin(a*x)^(3/2),x)/c/(-a^2*c
*x^2+c)^(1/2)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{5/2}}\,dx = \int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{5/2}}\,dx$$

```
[In] Int[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*(c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(3/2)) + (4*a
*Sqrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*x^2)^2*ArcSin[a*x]^(3/2)), x])/(3
*c*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\text{integral} = -\frac{2\sqrt{1-a^2x^2}}{3a\,(c-a^2cx^2)^{3/2}\arcsin(ax)^{3/2}} + \frac{\left(4a\sqrt{1-a^2x^2}\right)\int \frac{x}{(1-a^2x^2)^2\arcsin(ax)^{3/2}}\,dx}{3c\sqrt{c-a^2cx^2}}$$

Mathematica [N/A]

Not integrable

Time = 2.17 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}}\,dx=\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}}\,dx$$

```
[In] Integrate[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2)),x]
[Out] Integrate[1/((c - a^2*c*x^2)^(3/2)*ArcSin[a*x]^(5/2)), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.24 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int \frac{1}{\left(-a^{2} c\,x^{2}+c\right)^{\frac{3}{2}} \arcsin\left(a x\right)^{\frac{5}{2}}}d x$$

```
[In] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x)
[Out] int(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{\left(c-a^2cx^2\right)^{3/2}\arcsin(ax)^{5/2}}\,dx=\text{Timed out}$$

```
[In] integrate(1/(-a**2*c*x**2+c)**(3/2)/asin(a*x)**(5/2),x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{5/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.58 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{5/2}}\,dx = \int \frac{1}{(-a^2cx^2+c)^{\frac{3}{2}}\arcsin(ax)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(3/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
[Out] integrate(1/((-a^2*c*x^2 + c)^(3/2)*arcsin(a*x)^(5/2)), x)
```

Mupad [N/A]

Not integrable

Time = 0.14 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{1}{(c-a^2cx^2)^{3/2}\arcsin(ax)^{5/2}}\,dx = \int \frac{1}{\mathrm{asin}(a\,x)^{5/2}\,(c-a^2\,c\,x^2)^{3/2}}\,dx$$

```
[In] int(1/(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(3/2)),x)
[Out] int(1/(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(3/2)), x)
```

3.481 $\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{5/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{5/2}}\,dx = -\frac{2\sqrt{1-a^2x^2}}{3a(c-a^2cx^2)^{5/2}\arcsin(ax)^{3/2}} + \frac{8a\sqrt{1-a^2x^2}\,\text{Int}\left(\frac{x}{(1-a^2x^2)^3\arcsin(ax)^{3/2}},x\right)}{3c^2\sqrt{c-a^2cx^2}}$$

```
[Out] -2/3*(-a^2*x^2+1)^(1/2)/a/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(3/2)+8/3*a*(-a^
2*x^2+1)^(1/2)*Unintegrable(x/(-a^2*x^2+1)^3/arcsin(a*x)^(3/2),x)/c^2/(-a^2
*c*x^2+c)^(1/2)
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{5/2}}\,dx = \int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{5/2}}\,dx$$

```
[In] Int[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(5/2)),x]
```

```
[Out] (-2*Sqrt[1 - a^2*x^2])/(3*a*(c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(3/2)) + (8*a
*Sqrt[1 - a^2*x^2]*Defer[Int][x/((1 - a^2*x^2)^3*ArcSin[a*x]^(3/2)), x])/(3
*c^2*Sqrt[c - a^2*c*x^2])
```

Rubi steps

$$\text{integral} = -\frac{2\sqrt{1-a^2x^2}}{3a(c-a^2cx^2)^{5/2}\arcsin(ax)^{3/2}} + \frac{\left(8a\sqrt{1-a^2x^2}\right)\int \frac{x}{(1-a^2x^2)^3\arcsin(ax)^{3/2}}\,dx}{3c^2\sqrt{c-a^2cx^2}}$$

Mathematica [N/A]

Not integrable

Time = 2.39 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{5/2}}\,dx=\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{5/2}}\,dx$$

```
[In] Integrate[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(5/2)),x]
[Out] Integrate[1/((c - a^2*c*x^2)^(5/2)*ArcSin[a*x]^(5/2)), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.30 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.83

$$\int \frac{1}{\left(-a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \arcsin\left(a x\right)^{\frac{5}{2}}}d x$$

```
[In] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x)
[Out] int(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{5/2}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{5/2}}\,dx=\text{Timed out}$$

```
[In] integrate(1/(-a**2*c*x**2+c)**(5/2)/asin(a*x)**(5/2),x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{5/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.58 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{5/2}}\,dx = \int \frac{1}{(-a^2cx^2+c)^{\frac{5}{2}}\arcsin{(ax)}^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(-a^2*c*x^2+c)^(5/2)/arcsin(a*x)^(5/2),x, algorithm="giac")
[Out] integrate(1/((-a^2*c*x^2 + c)^(5/2)*arcsin(a*x)^(5/2)), x)
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{1}{(c-a^2cx^2)^{5/2}\arcsin(ax)^{5/2}}\,dx = \int \frac{1}{\mathrm{asin}\left(a\,x\right)^{5/2}\,{\left(c-a^2\,c\,x^2\right)}^{5/2}}\,dx$$

```
[In] int(1/(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(5/2)),x)
[Out] int(1/(asin(a*x)^(5/2)*(c - a^2*c*x^2)^(5/2)), x)
```

3.482 $\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx$

Optimal result

Integrand size = 29, antiderivative size = 259

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx=\frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{8bc^3(1+n)\sqrt{1-c^2x^2}}+\frac{i2^{-2(3+n)}e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}-\frac{i2^{-2(3+n)}e^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$

```
[Out] 1/8*(a+b*arcsin(c*x))^(1+n)*(-c^2*d*x^2+d)^(1/2)/b/c^3/(1+n)/(-c^2*x^2+1)^(
1/2)+I*(a+b*arcsin(c*x))^n*GAMMA(1+n,-4*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+
d)^(1/2)/(2^(6+2*n))/c^3/exp(4*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^
2+1)^(1/2)-I*exp(4*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,4*I*(a+b*arcsin(c*x
))/b)*(-c^2*d*x^2+d)^(1/2)/(2^(6+2*n))/c^3/((I*(a+b*arcsin(c*x))/b)^n)/(-c^
2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.138, Rules used

$= \{4809, 4491, 3388, 2212\}$

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx = \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{n+1}}{8bc^3(n+1)\sqrt{1-c^2x^2}} + \frac{i2^{-2(n+3)}e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}} - \frac{i2^{-2(n+3)}e^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$

```
[In] Int[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(8*b*c^3*(1 + n)*Sqrt[1 -
 c^2*x^2]) + (I*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4
*I)*(a + b*ArcSin[c*x]))/b])/(2^(2*(3 + n))*c^3*E^(((4*I)*a)/b)*Sqrt[1 - c^
2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*E^(((4*I)*a)/b)*Sqrt[d - c^2*
d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(
2^(2*(3 + n))*c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
```

```
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{d-c^2dx^2}\text{Subst}\left(\int x^n\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{bc^3\sqrt{1-c^2x^2}}$$

$$= \frac{\sqrt{d-c^2dx^2}\text{Subst}\left(\int\left(\frac{x^n}{8}-\frac{1}{8}x^n\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)\right)\,dx,x,a+b\arcsin(cx)\right)}{bc^3\sqrt{1-c^2x^2}}$$

$$= \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{8bc^3(1+n)\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\text{Subst}\left(\int x^n\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{8bc^3\sqrt{1-c^2x^2}}$$

$$= \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{8bc^3(1+n)\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\text{Subst}\left(\int e^{-i\left(\frac{4a}{b}-\frac{4x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{16bc^3\sqrt{1-c^2x^2}} - \frac{\sqrt{d-c^2dx^2}\text{Subst}\left(\int e^{i\left(\frac{4a}{b}-\frac{4x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{16bc^3\sqrt{1-c^2x^2}}$$

$$= \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{8bc^3(1+n)\sqrt{1-c^2x^2}} + \frac{i4^{-3-n}e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}} - \frac{i4^{-3-n}e^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.65 (sec) , antiderivative size = 191, normalized size of antiderivative = 0.74

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx = \frac{d\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{8a+8b\arcsin(cx)}{b+bn}+i4^{-n}e^{-\frac{4ia}{b}}\left(\frac{(a+b\arcsin(cx))^2}{b^2}\right)^{-n}\left(\left(\frac{i(a+b\arcsin(cx))}{b}\right)^n\Gamma\left(1+n,\right.\right.\right.}{64c^3\sqrt{d(1-c^2x^2)}}$$

```
[In] Integrate[x^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((8*a + 8*b*ArcSin[c*x])/(b + b*
n) + (I*(((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-4*I)*(a + b*ArcSin[c
*x]))/b] - E^(((8*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((
4*I)*(a + b*ArcSin[c*x]))/b]))/(4^n*E^(((4*I)*a)/b)*((a + b*ArcSin[c*x])^2/
b^2)^n)))/(64*c^3*Sqrt[d*(1 - c^2*x^2)])
```

Maple [F]

$$\int x^{2}\sqrt{-c^{2}d\,x^{2}+d}\,(a+b\arcsin(cx))^{n}\,dx$$

```
[In] int(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

Fricas [F]

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^nx^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas
")
```

```
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Sympy [F]

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx=\int x^{2}\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))^{n}\,dx$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Integral(x**2*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**n, x)
```

Maxima [F]

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^nx^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima
")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Giac [F]

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)^nx^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx=\int x^2\,(a+b\,\mathrm{asin}(c\,x))^n\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int(x^2*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2),x)
[Out] int(x^2*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2), x)
```

3.483 $\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx$

Optimal result

Integrand size = 27, antiderivative size = 391

$$\begin{aligned}
&\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx\\
&=-\frac{e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}\\
&\quad-\frac{e^{\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}\\
&\quad-\frac{3^{-1-n}e^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}\\
&\quad-\frac{3^{-1-n}e^{\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] -1/8*(a+b*arcsin(c*x))^n*GAMMA(1+n,-I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(
1/2)/c^2/exp(I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/8*exp
(I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)
^(1/2)/c^2/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/8*3^(-1-n)*(a+b
*arcsin(c*x))^n*GAMMA(1+n,-3*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^
2/exp(3*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/8*3^(-1-n)
*exp(3*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,3*I*(a+b*arcsin(c*x))/b)*(-c^2*
d*x^2+d)^(1/2)/c^2/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 391, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4809, 4491, 3389, 2212}

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx$$
$$=-\frac{e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{i(a+b\arcsin(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}$$
$$-\frac{3^{-n-1}e^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{3i(a+b\arcsin(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}$$
$$-\frac{e^{\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{i(a+b\arcsin(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}$$
$$-\frac{3^{-n-1}e^{\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{3i(a+b\arcsin(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}$$

```
[In] Int[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] -1/8*(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*A
rcSin[c*x]))/b])/(c^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*
x]))/b)^n) - (E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1
 + n, (I*(a + b*ArcSin[c*x]))/b])/(8*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSi
n[c*x]))/b)^n) - (3^(-1 - n)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamm
a[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(8*c^2*E^(((3*I)*a)/b)*Sqrt[1 - c
^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (3^(-1 - n)*E^(((3*I)*a)/b)*Sqr
t[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*
x]))/b])/(8*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3389

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{\sqrt{d-c^2dx^2}\text{Subst}\left(\int x^n\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{bc^2\sqrt{1-c^2x^2}}$$

$$=-\frac{\sqrt{d-c^2dx^2}\text{Subst}\left(\int\left(\frac{1}{4}x^n\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)+\frac{1}{4}x^n\sin\left(\frac{a}{b}-\frac{x}{b}\right)\right)\,dx,x,a+b\arcsin(cx)\right)}{bc^2\sqrt{1-c^2x^2}}$$

$$=-\frac{\sqrt{d-c^2dx^2}\text{Subst}\left(\int x^n\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{4bc^2\sqrt{1-c^2x^2}}-\frac{\sqrt{d-c^2dx^2}\text{Subst}\left(\int x^n\sin\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{4bc^2\sqrt{1-c^2x^2}}$$

$$=-\frac{\left(i\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{3a}{b}-\frac{3x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{8bc^2\sqrt{1-c^2x^2}}+\frac{\left(i\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{3a}{b}-\frac{3x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{8bc^2\sqrt{1-c^2x^2}}-\frac{\left(i\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{8bc^2\sqrt{1-c^2x^2}}+\frac{\left(i\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{8bc^2\sqrt{1-c^2x^2}}$$

$$= -\frac{e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}$$
$$-\frac{e^{\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}$$
$$-\frac{3^{-1-n}e^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}$$
$$-\frac{3^{-1-n}e^{\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(cx))}{b}\right)}{8c^2\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.67 (sec) , antiderivative size = 272, normalized size of antiderivative = 0.70

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx$$
$$= \frac{de^{-\frac{3ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(3e^{\frac{2ia}{b}}\left(-\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)-e^{\frac{2ia}{b}}\left(\frac{i(a+b\right.\right.\right.}{}$$

```
[In] Integrate[x*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*(3*E^(((2*I)*a)/b)*(-(Gamma[1 +
n, ((-I)*(a + b*ArcSin[c*x]))/b]/(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (E^(((
2*I)*a)/b)*Gamma[1 + n, (I*(a + b*ArcSin[c*x]))/b])/((I*(a + b*ArcSin[c*x])
)/b)^n) - (((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-3*I)*(a + b*ArcSin
[c*x]))/b] + E^(((6*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n,
((3*I)*(a + b*ArcSin[c*x]))/b])/(3^n*((a + b*ArcSin[c*x])^2/b^2)^n)))/(24*c
^2*E^(((3*I)*a)/b)*Sqrt[d*(1 - c^2*x^2)])
```

Maple [F]

$$\int x\sqrt{-c^2d\,x^2+d}\,(a+b\arcsin(cx))^n\,dx$$

```
[In] int(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)
```

Fricas [F]

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^nx\,dx$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x, x)
```

Sympy [F]

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx=\int x\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\operatorname{asin}(cx))^n\,dx$$

```
[In] integrate(x*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n,x)
[Out] Integral(x*sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**n, x)
```

Maxima [F]

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx=\int\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^nx\,dx$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n*x, x)
```

Giac [F(-2)]

Exception generated.

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx=\int x\,(a+b\,\mathrm{asin}(c\,x))^n\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int(x*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2),x)
[Out] int(x*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2), x)
```

3.484 $\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx$

Optimal result

Integrand size = 26, antiderivative size = 259

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx = \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{2bc(1+n)\sqrt{1-c^2x^2}} - \frac{i2^{-3-n}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}} + \frac{i2^{-3-n}e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$

```
[Out] 1/2*(a+b*arcsin(c*x))^(1+n)*(-c^2*d*x^2+d)^(1/2)/b/c/(1+n)/(-c^2*x^2+1)^(1/
2)-I*2^(-3-n)*(a+b*arcsin(c*x))^n*GAMMA(1+n,-2*I*(a+b*arcsin(c*x))/b)*(-c^2
*d*x^2+d)^(1/2)/c/exp(2*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1
/2)+I*2^(-3-n)*exp(2*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,2*I*(a+b*arcsin(c
*x))/b)*(-c^2*d*x^2+d)^(1/2)/c/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/
2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used

$= \{4753, 3393, 3388, 2212\}$

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx = \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{n+1}}{2bc(n+1)\sqrt{1-c^2x^2}} - \frac{i2^{-n-3}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}} + \frac{i2^{-n-3}e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$

```
[In] Int[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(2*b*c*(1 + n)*Sqrt[1 - c
^2*x^2]) - (I*2^(-3 - n)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1
+ n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((2*I)*a)/b)*Sqrt[1 - c^2*x^2]*
(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-3 - n)*E^(((2*I)*a)/b)*Sqrt[d -
c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c*x]))/b
])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int x^n\cos^2\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{bc\sqrt{1-c^2x^2}}$$
$$= \frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int\left(\frac{x^n}{2}+\frac{1}{2}x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\right)\,dx,x,a+b\arcsin(cx)\right)}{bc\sqrt{1-c^2x^2}}$$
$$= \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{2bc(1+n)\sqrt{1-c^2x^2}} + \frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{2bc\sqrt{1-c^2x^2}}$$
$$= \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{2bc(1+n)\sqrt{1-c^2x^2}} + \frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int e^{-i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{4bc\sqrt{1-c^2x^2}} + \frac{\sqrt{d-c^2dx^2}\,\text{Subst}\left(\int e^{i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{4bc\sqrt{1-c^2x^2}}$$
$$= \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{2bc(1+n)\sqrt{1-c^2x^2}} - \frac{i2^{-3-n}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}} + \frac{i2^{-3-n}e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.64 (sec) , antiderivative size = 182, normalized size of antiderivative = 0.70

$$\int\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx$$
$$= \frac{d\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{4a+4b\arcsin(cx)}{b+bn}-i2^{-n}e^{-\frac{2ia}{b}}\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)\right.}{8c\sqrt{d(1-c^2x^2)}}$$

```
[In] Integrate[Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((4*a + 4*b*ArcSin[c*x])/(b + b*
n) - (I*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(2^n*E^(((2*I)*a)/b)*
(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*E^(((2*I)*a)/b)*Gamma[1 + n, ((2*I)*
(a + b*ArcSin[c*x]))/b])/(2^n*((I*(a + b*ArcSin[c*x]))/b)^n)))/(8*c*Sqrt[d*
(1 - c^2*x^2)])
```

Maple [F]

$$\int \sqrt{-c^2 d\,x^2 + d}\,(a + b \arcsin{(cx)})^n \,dx$$

[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)

[Out] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x)

Fricas [F]

$$\int \sqrt{d - c^2dx^2}(a + b\arcsin(cx))^n \,dx = \int \sqrt{-c^2dx^2 + d}(b\arcsin{(cx)} + a)^n \,dx$$

[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")

[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n, x)

Sympy [F]

$$\int \sqrt{d - c^2dx^2}(a + b\arcsin(cx))^n \,dx = \int \sqrt{-d\,(cx - 1)\,(cx + 1)}(a + b\,\mathrm{asin}\,(cx))^n \,dx$$

[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n,x)

[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**n, x)

Maxima [F]

$$\int \sqrt{d - c^2dx^2}(a + b\arcsin(cx))^n \,dx = \int \sqrt{-c^2dx^2 + d}(b\arcsin{(cx)} + a)^n \,dx$$

[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")

[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n, x)

Giac [F(-2)]

Exception generated.

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\,dx = \int (a+b\,\mathrm{asin}(c\,x))^n\,\sqrt{d-c^2\,d\,x^2}\,dx$$

```
[In] int((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2), x)
```

3.485 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 29

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x}\,dx = \frac{de^{-\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)}{2\sqrt{d-c^2dx^2}} + \frac{de^{\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{2\sqrt{d-c^2dx^2}} + d\mathrm{Int}\left(\frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}},x\right)$$

```
[Out] 1/2*d*(a+b*arcsin(c*x))^n*GAMMA(1+n,-I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1
/2)/exp(I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+1/2*d*exp(
I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1
/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+d*Unintegrable((a+b*ar
csin(c*x))^n/x/(-c^2*d*x^2+d)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x}\,dx = \int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x}\,dx$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x,x]
```

```
[Out] (d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*ArcSin
[c*x]))/b])/(2*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/
b)^n) + (d*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n,
 (I*(a + b*ArcSin[c*x]))/b])/(2*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x])
)/b)^n) + d*Defer[Int][(a + b*ArcSin[c*x])^n/(x*Sqrt[d - c^2*d*x^2]), x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(\frac{d(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}-\frac{c^2dx(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\right)dx\\
&= d\int \frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx-\left(c^2d\right)\int \frac{x(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\,dx\\
&= d\int \frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx+\frac{\left(d\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int x^n\sin\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}}\\
&= d\int \frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx\\
&\quad+\frac{\left(id\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{2b\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(id\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int e^{i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{2b\sqrt{d-c^2dx^2}}\\
&= \frac{de^{-\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)}{2\sqrt{d-c^2dx^2}}\\
&\quad+\frac{de^{\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{2\sqrt{d-c^2dx^2}}\\
&\quad+d\int \frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx
\end{aligned}
$$

Mathematica [N/A]

Not integrable

Time = 0.30 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$
\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x}\,dx=\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x}\,dx
$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x,x]
```

```
[Out] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.34 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int \frac{\sqrt{-c^2 d\,x^2+d}\,(a+b\arcsin(cx))^n}{x}dx$$

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x)
[Out] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x}\,dx = \int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^n}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="fricas")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n/x, x)
```

Sympy [N/A]

Not integrable

Time = 2.38 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x}\,dx = \int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))^n}{x}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n/x,x)
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**n/x, x)
```

Maxima [N/A]

Not integrable

Time = 0.69 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x}\,dx = \int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^n}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="maxima")
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n/x, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.14 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^n\,\sqrt{d-c^2\,d\,x^2}}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2))/x, x)
```

3.486 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x^2}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 29

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x^2}\,dx = -\frac{cd\sqrt{1-c^2x^2}(a+b\arcsin(cx))^{1+n}}{b(1+n)\sqrt{d-c^2dx^2}} + d\text{Int}\left(\frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}},x\right)$$

```
[Out] -c*d*(a+b*arcsin(c*x))^(1+n)*(-c^2*x^2+1)^(1/2)/b/(1+n)/(-c^2*d*x^2+d)^(1/2
)+d*Unintegrable((a+b*arcsin(c*x))^n/x^2/(-c^2*d*x^2+d)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x^2}\,dx = \int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x^2}\,dx$$

```
[In] Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x^2,x]
```

```
[Out] -((c*d*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(b*(1 + n)*Sqrt[d - c
^2*d*x^2])) + d*Defer[Int][(a + b*ArcSin[c*x])^n/(x^2*Sqrt[d - c^2*d*x^2]),
 x]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(-\frac{c^2d(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}+\frac{d(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\right)\,dx\\
&= d\int \frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\,dx-\left(c^2d\right)\int \frac{(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\,dx\\
&= -\frac{cd\sqrt{1-c^2x^2}(a+b\arcsin(cx))^{1+n}}{b(1+n)\sqrt{d-c^2dx^2}}+d\int \frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\,dx
\end{aligned}
$$

Mathematica [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$
\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x^2}\,dx=\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x^2}\,dx
$$

```
[In] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x^2,x]
[Out] Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n)/x^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.18 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$
\int \frac{\sqrt{-c^2d\,x^2+d}\,(a+b\arcsin\,(cx))^n}{x^2}dx
$$

```
[In] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x)
[Out] int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$
\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x^2}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin\,(cx)+a)^n}{x^2}\,dx
$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="fricas
")
[Out] integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Sympy [N/A]

Not integrable

Time = 4.50 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x^2}\,dx=\int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))^n}{x^2}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**n/x**2,x)
```

```
[Out] Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**n/x**2, x)
```

Maxima [N/A]

Not integrable

Time = 0.69 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x^2}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin\,(cx)+a)^n}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="maxima
")
```

```
[Out] integrate(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x^2}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n}{x^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^n\,\sqrt{d-c^2\,d\,x^2}}{x^2}\,dx$$

```
[In] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2))/x^2,x)
[Out] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(1/2))/x^2, x)
```

3.487 $\int x^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n\,dx$

Optimal result

Integrand size = 29, antiderivative size = 684

$$\int x^2(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n\,dx = \frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{16bc^3(1+n)\sqrt{1-c^2x^2}}$$
$$-\frac{i2^{-7-n}de^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$+\frac{i2^{-7-n}de^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$+\frac{i2^{-7-2n}de^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$-\frac{i2^{-7-2n}de^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$+\frac{i2^{-7-n}3^{-1-n}de^{-\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{6i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$-\frac{i2^{-7-n}3^{-1-n}de^{\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{6i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$

```
[Out] 1/16*d*(a+b*arcsin(c*x))^(1+n)*(-c^2*d*x^2+d)^(1/2)/b/c^3/(1+n)/(-c^2*x^2+1
)^(1/2)-I*2^(-7-n)*d*(a+b*arcsin(c*x))^n*GAMMA(1+n,-2*I*(a+b*arcsin(c*x))/b
)*(-c^2*d*x^2+d)^(1/2)/c^3/exp(2*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*
x^2+1)^(1/2)+I*2^(-7-n)*d*exp(2*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,2*I*(a
+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/((I*(a+b*arcsin(c*x))/b)^n)/(-c
^2*x^2+1)^(1/2)+I*2^(-7-2*n)*d*(a+b*arcsin(c*x))^n*GAMMA(1+n,-4*I*(a+b*arcs
```

```
in(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/exp(4*I*a/b)/((-I*(a+b*arcsin(c*x))/b)
^n)/(-c^2*x^2+1)^(1/2)-I*2^(-7-2*n)*d*exp(4*I*a/b)*(a+b*arcsin(c*x))^n*GAMM
A(1+n,4*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/((I*(a+b*arcsin(c*x
))/b)^n)/(-c^2*x^2+1)^(1/2)+I*2^(-7-n)*3^(-1-n)*d*(a+b*arcsin(c*x))^n*GAMMA
(1+n,-6*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/exp(6*I*a/b)/((-I*(
a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-I*2^(-7-n)*3^(-1-n)*d*exp(6*I*a/b
)*(a+b*arcsin(c*x))^n*GAMMA(1+n,6*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/
2)/c^3/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 684, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.138$, Rules used = {4809, 4491, 3388, 2212}

$$\begin{aligned}
&\int x^2\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx=\frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{n+1}}{16bc^3(n+1)\sqrt{1-c^2x^2}}\\
&-\frac{id2^{-n-7}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}\\
&+\frac{id2^{-2n-7}e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}\\
&+\frac{id2^{-n-7}3^{-n-1}e^{-\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{6i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}\\
&+\frac{id2^{-n-7}e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}\\
&-\frac{id2^{-2n-7}e^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}\\
&-\frac{id2^{-n-7}3^{-n-1}e^{\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{6i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[In] Int[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(16*b*c^3*(1 + n)*Sqrt[
1 - c^2*x^2]) - (I*2^(-7 - n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*G
amma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((2*I)*a)/b)*Sqrt[1 -
c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*d*E^(((2*I)*a)/b
)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcS
in[c*x]))/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I*2^
(-7 - 2*n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)
```

```
*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a
+ b*ArcSin[c*x]))/b)^n) - (I*2^(-7 - 2*n)*d*E^(((4*I)*a)/b)*Sqrt[d - c^2*d*
x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(c^
3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*3^(-1 -
n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-6*I)*(a + b*
ArcSin[c*x]))/b])/(c^3*E^(((6*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcS
in[c*x]))/b)^n) - (I*2^(-7 - n)*3^(-1 - n)*d*E^(((6*I)*a)/b)*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin[c*x]))/b])/(c
^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{bc^3\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{x^n}{16}-\frac{1}{32}x^n\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)-\frac{1}{16}x^n\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)+\frac{1}{32}x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\right)\,dx,\right.}{bc^3\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{16bc^3(1+n)\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int x^n\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)\,dx, x, a+b\arcsin(cx)\right)}{32bc^3\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\,dx, x, a+b\arcsin(cx)\right)}{32bc^3\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int x^n\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)\,dx, x, a+b\arcsin(cx)\right)}{16bc^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{16bc^3(1+n)\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int e^{-i\left(\frac{6a}{b}-\frac{6x}{b}\right)}x^n\,dx, x, a+b\arcsin(cx)\right)}{64bc^3\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int e^{i\left(\frac{6a}{b}-\frac{6x}{b}\right)}x^n\,dx, x, a+b\arcsin(cx)\right)}{64bc^3\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int e^{-i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx, x, a+b\arcsin(cx)\right)}{64bc^3\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int e^{i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx, x, a+b\arcsin(cx)\right)}{64bc^3\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int e^{-i\left(\frac{4a}{b}-\frac{4x}{b}\right)}x^n\,dx, x, a+b\arcsin(cx)\right)}{32bc^3\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(d\sqrt{d-c^2dx^2}\right)\operatorname{Subst}\left(\int e^{i\left(\frac{4a}{b}-\frac{4x}{b}\right)}x^n\,dx, x, a+b\arcsin(cx)\right)}{32bc^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{16bc^3(1+n)\sqrt{1-c^2x^2}}$$
$$- \frac{i2^{-7-n}de^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$+ \frac{i2^{-7-n}de^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$+ \frac{i2^{-7-2n}de^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$- \frac{i2^{-7-2n}de^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$+ \frac{i2^{-7-n}3^{-1-n}de^{-\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{6i(a+b\arcsin(cx)}{b}\right.}{c^3\sqrt{1-c^2x^2}}$$
$$- \frac{i2^{-7-n}3^{-1-n}de^{\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{6i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 2.79 (sec) , antiderivative size = 509, normalized size of antiderivative = 0.74

$$\int x^2\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx = \frac{d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{24a}{b+bn}+\frac{24\arcsin(cx)}{1+n}-3i2^{-n}e^{-\frac{2ia}{b}}\left(\frac{i(a+b\arcsin(cx))}{b}\right)^n\left(\frac{(a+\right.\right.}{}$$

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((24*a)/(b + b*n) + (24*ArcSin
[c*x])/(1 + n) - ((3*I)*((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-2*I)*
(a + b*ArcSin[c*x]))/b])/(2^n*E^(((2*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^n
) + ((3*I)*E^(((2*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((
2*I)*(a + b*ArcSin[c*x]))/b])/(2^n*((a + b*ArcSin[c*x])^2/b^2)^n) + ((3*I)*
((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-4*I)*(a + b*ArcSin[c*x]))/b])
/(4^n*E^(((4*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^n) - ((3*I)*E^(((4*I)*a)/
b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x])
)/b])/(4^n*((a + b*ArcSin[c*x])^2/b^2)^n) + (I*((I*(a + b*ArcSin[c*x]))/b)^
n*Gamma[1 + n, ((-6*I)*(a + b*ArcSin[c*x]))/b])/(6^n*E^(((6*I)*a)/b)*((a +
b*ArcSin[c*x])^2/b^2)^n) - (I*E^(((6*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b
)^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin[c*x]))/b])/(6^n*((a + b*ArcSin[c*x])^
2/b^2)^n)))/(384*c^3*Sqrt[d - c^2*d*x^2])
```

Maple [F]

$$\int x^2\left(-c^2 d\,x^2+d\right)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)^n dx$$

```
[In] int(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

Fricas [F]

$$\int x^2(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^n\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)^n x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas
")
```

```
[Out] integral(-(c^2*d*x^4 - d*x^2)*sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n, x
)
```

Sympy [F(-1)]

Timed out.

$$\int x^2(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^n\,dx = \text{Timed out}$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int x^2(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^n\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)^n x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima
")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Giac [F]

$$\int x^2 (d - c^2 dx^2)^{3/2} (a + b \arcsin(cx))^n dx = \int (-c^2 dx^2 + d)^{\frac{3}{2}} (b \arcsin(cx) + a)^n x^2 dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^2 (d - c^2 dx^2)^{3/2} (a + b \arcsin(cx))^n dx = \int x^2 (a + b \operatorname{asin}(c x))^n (d - c^2 d x^2)^{3/2} dx$$

```
[In] int(x^2*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x^2*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2), x)
```

3.488 $\int x(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n\,dx$

Optimal result

Integrand size = 27, antiderivative size = 595

$$\int x(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n\,dx = -\frac{de^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)}{16c^2\sqrt{1-c^2x^2}}$$
$$-\frac{de^{\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{16c^2\sqrt{1-c^2x^2}}$$
$$-\frac{3^{-n}de^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}}$$
$$-\frac{3^{-n}de^{\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}}$$
$$-\frac{5^{-1-n}de^{-\frac{5ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{5i(a+b\arcsin(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}}$$
$$-\frac{5^{-1-n}de^{\frac{5ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{5i(a+b\arcsin(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}}$$

```
[Out] -1/16*d*(a+b*arcsin(c*x))^n*GAMMA(1+n,-I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d
)^(1/2)/c^2/exp(I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/16
*d*exp(I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,I*(a+b*arcsin(c*x))/b)*(-c^2*d*
x^2+d)^(1/2)/c^2/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/32*d*(a+b
*arcsin(c*x))^n*GAMMA(1+n,-3*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/(3
^n)/c^2/exp(3*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/32*d
*exp(3*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,3*I*(a+b*arcsin(c*x))/b)*(-c^2*
```

```
d*x^2+d)^(1/2)/(3^n)/c^2/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/3
2*5^(-1-n)*d*(a+b*arcsin(c*x))^n*GAMMA(1+n,-5*I*(a+b*arcsin(c*x))/b)*(-c^2*
d*x^2+d)^(1/2)/c^2/exp(5*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(
1/2)-1/32*5^(-1-n)*d*exp(5*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,5*I*(a+b*ar
csin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^2/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^
2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 595, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {4809, 4491, 3389, 2212}

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx =$$
$$-\frac{de^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{i(a+b\arcsin(cx))}{b}\right)}{16c^2\sqrt{1-c^2x^2}}$$
$$-\frac{d3^{-n}e^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{3i(a+b\arcsin(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}}$$
$$-\frac{d5^{-n-1}e^{-\frac{5ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{5i(a+b\arcsin(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}}$$
$$-\frac{de^{\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{i(a+b\arcsin(cx))}{b}\right)}{16c^2\sqrt{1-c^2x^2}}$$
$$-\frac{d3^{-n}e^{\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{3i(a+b\arcsin(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}}$$
$$-\frac{d5^{-n-1}e^{\frac{5ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{5i(a+b\arcsin(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}}$$

```
[In] Int[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] -1/16*(d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a +
b*ArcSin[c*x]))/b])/(c^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin
[c*x]))/b)^n) - (d*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Ga
mma[1 + n, (I*(a + b*ArcSin[c*x]))/b])/(16*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b
*ArcSin[c*x]))/b)^n) - (d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1
 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(32*3^n*c^2*E^(((3*I)*a)/b)*Sqrt[1 -
 c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (d*E^(((3*I)*a)/b)*Sqrt[d - c
^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b]
)/(32*3^n*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (5^(-1 - n
)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-5*I)*(a + b*A
```

rcSin[c*x]))/b])/(32*c^2*E^(((5*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (5^(-1 - n)*d*E^(((5*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((5*I)*(a + b*ArcSin[c*x]))/b])/(32*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3389

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{bc^2\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{16}x^n\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)+\frac{3}{16}x^n\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)+\frac{1}{8}x^n\sin\left(\frac{a}{b}-\frac{x}{b}\right)\right)\,dx,x,a+b}{bc^2\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{16bc^2\sqrt{1-c^2x^2}} - \frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\sin\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{8bc^2\sqrt{1-c^2x^2}} - \frac{\left(3d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{16bc^2\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(id\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{5a}{b}-\frac{5x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{32bc^2\sqrt{1-c^2x^2}} + \frac{\left(id\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{5a}{b}-\frac{5x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{32bc^2\sqrt{1-c^2x^2}} - \frac{\left(id\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{16bc^2\sqrt{1-c^2x^2}} + \frac{\left(id\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{16bc^2\sqrt{1-c^2x^2}} - \frac{\left(3id\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{3a}{b}-\frac{3x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{32bc^2\sqrt{1-c^2x^2}} + \frac{\left(3id\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{3a}{b}-\frac{3x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{32bc^2\sqrt{1-c^2x^2}}$$

$$= -\frac{de^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)}{16c^2\sqrt{1-c^2x^2}} - \frac{de^{\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{16c^2\sqrt{1-c^2x^2}} - \frac{3^{-n}de^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}} - \frac{3^{-n}de^{\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}} - \frac{5^{-1-n}de^{-\frac{5ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{5i(a+b\arcsin(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}} - \frac{5^{-1-n}de^{\frac{5ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{5i(a+b\arcsin(cx))}{b}\right)}{32c^2\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 1.55 (sec) , antiderivative size = 464, normalized size of antiderivative = 0.78

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx =$$

$$-\frac{15^{-1-n}d^2e^{-\frac{5ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{(a+b\arcsin(cx))^2}{b^2}\right)^{-3n}\left(2\ 15^{1+n}e^{\frac{4ia}{b}}\left(\frac{i(a+b\arcsin(cx))}{b}\right)^n\left(\frac{(a+b\arcsin(cx}{b^2}\right.\right.}{}$$

```
[In] Integrate[x*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] -1/32*(15^(-1 - n)*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*(2*15^(1 + n
)*E^(((4*I)*a)/b)*((I*(a + b*ArcSin[c*x]))/b)^n*((a + b*ArcSin[c*x])^2/b^2)
^(2*n)*Gamma[1 + n, ((-I)*(a + b*ArcSin[c*x]))/b] + (((-I)*(a + b*ArcSin[c*
x]))/b)^n*(2*15^(1 + n)*E^(((6*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^(2*n)*G
amma[1 + n, (I*(a + b*ArcSin[c*x]))/b] + 3*(5^(1 + n)*E^(((2*I)*a)/b)*((I*(
a + b*ArcSin[c*x]))/b)^(2*n)*((a + b*ArcSin[c*x])^2/b^2)^n*Gamma[1 + n, ((-
3*I)*(a + b*ArcSin[c*x]))/b] + 5^(1 + n)*E^(((8*I)*a)/b)*((a + b*ArcSin[c*x
])^2/b^2)^(2*n)*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b] + 3^n*((((-I)*(
a + b*ArcSin[c*x]))/b)^n*((I*(a + b*ArcSin[c*x]))/b)^(3*n)*Gamma[1 + n, ((-
5*I)*(a + b*ArcSin[c*x]))/b] + E^(((10*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)
^(2*n)*Gamma[1 + n, ((5*I)*(a + b*ArcSin[c*x]))/b])))))/(c^2*E^(((5*I)*a)/b
)*Sqrt[d - c^2*d*x^2]*((a + b*ArcSin[c*x])^2/b^2)^(3*n))
```

Maple [F]

$$\int x\left(-c^2d\,x^2+d\right)^{\frac{3}{2}}(a+b\arcsin(cx))^n\,dx$$

```
[In] int(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

Fricas [F]

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx = \int\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)^n x\,dx$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
```

```
[Out] integral(-(c^2*d*x^3 - d*x)*sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)^n, x)
```

Sympy [F(-1)]

Timed out.

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx=\text{Timed out}$$

```
[In] integrate(x*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n,x)
[Out] Timed out
```

Maxima [F]

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx=\int\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)^nx\,dx$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n*x, x)
```

Giac [F(-2)]

Exception generated.

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx=\int x\,(a+b\,\mathrm{asin}(c\,x))^n\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

```
[In] int(x*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2),x)
[Out] int(x*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2), x)
```

3.489 $\int (d-c^2dx^2)^{3/2} (a+b\arcsin(cx))^n \, dx$

Optimal result

Integrand size = 26, antiderivative size = 466

$$\int (d-c^2dx^2)^{3/2} (a+b\arcsin(cx))^n \, dx = \frac{3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{8bc(1+n)\sqrt{1-c^2x^2}}$$
$$-\frac{i2^{-3-n}de^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$+\frac{i2^{-3-n}de^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$-\frac{i2^{-2(3+n)}de^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$+\frac{i2^{-2(3+n)}de^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$

```
[Out] 3/8*d*(a+b*arcsin(c*x))^(1+n)*(-c^2*d*x^2+d)^(1/2)/b/c/(1+n)/(-c^2*x^2+1)^(
1/2)-I*2^(-3-n)*d*(a+b*arcsin(c*x))^n*GAMMA(1+n,-2*I*(a+b*arcsin(c*x))/b)*(
-c^2*d*x^2+d)^(1/2)/c/exp(2*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1
)^(1/2)+I*2^(-3-n)*d*exp(2*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,2*I*(a+b*ar
csin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+
1)^(1/2)-I*d*(a+b*arcsin(c*x))^n*GAMMA(1+n,-4*I*(a+b*arcsin(c*x))/b)*(-c^2*
d*x^2+d)^(1/2)/(2^(6+2*n))/c/exp(4*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^
2*x^2+1)^(1/2)+I*d*exp(4*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,4*I*(a+b*arcs
in(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/(2^(6+2*n))/c/((I*(a+b*arcsin(c*x))/b)^n)/
(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 466, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {4753, 3393, 3388, 2212}

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx=\frac{3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{n+1}}{8bc(n+1)\sqrt{1-c^2x^2}}$$
$$-\frac{id2^{-n-3}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$-\frac{id2^{-2(n+3)}e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$+\frac{id2^{-n-3}e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$+\frac{id2^{-2(n+3)}e^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$

```
[In] Int[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (3*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(8*b*c*(1 + n)*Sqrt[1
 - c^2*x^2]) - (I*2^(-3 - n)*d*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Ga
mma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((2*I)*a)/b)*Sqrt[1 - c^2
*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-3 - n)*d*E^(((2*I)*a)/b)*S
qrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin[
c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (I*d*Sqrt[
d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)*(a + b*ArcSin[c*x
]))/b])/(2^(2*(3 + n))*c*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*Ar
cSin[c*x]))/b)^n) + (I*d*E^(((4*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(2^(2*(3 + n))*c*Sqrt[
1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
```

```
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos^4\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{bc\sqrt{1-c^2x^2}}\\
&= \frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{3x^n}{8}+\frac{1}{8}x^n\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)+\frac{1}{2}x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\right)\,dx,x,a+b\arcsin(cx)\right)}{bc\sqrt{1-c^2x^2}}\\
&= \frac{3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{8bc(1+n)\sqrt{1-c^2x^2}}\\
&\quad+\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{8bc\sqrt{1-c^2x^2}}\\
&\quad+\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{2bc\sqrt{1-c^2x^2}}\\
&= \frac{3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{8bc(1+n)\sqrt{1-c^2x^2}}\\
&\quad+\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{4a}{b}-\frac{4x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{16bc\sqrt{1-c^2x^2}}\\
&\quad+\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{4a}{b}-\frac{4x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{16bc\sqrt{1-c^2x^2}}\\
&\quad+\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{4bc\sqrt{1-c^2x^2}}\\
&\quad+\frac{\left(d\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{4bc\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= \frac{3d\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{8bc(1+n)\sqrt{1-c^2x^2}} - \frac{i2^{-3-n}de^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}} + \frac{i2^{-3-n}de^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}} - \frac{i4^{-3-n}de^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}} + \frac{i4^{-3-n}de^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 1.46 (sec) , antiderivative size = 327, normalized size of antiderivative = 0.70

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx = \frac{d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{8(a+b\arcsin(cx))}{b(1+n)}+8\left(\frac{4a+4b\arcsin(cx)}{b+bn}-i2^{-n}e^{-\frac{2ia}{b}}\left(-\frac{i(a+\cdots}{}\right.\right.\right.}{}$$

```
[In] Integrate[(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((-8*(a + b*ArcSin[c*x]))/(b*(
1 + n)) + 8*((4*a + 4*b*ArcSin[c*x])/(b + b*n) - (I*Gamma[1 + n, ((-2*I)*(a
 + b*ArcSin[c*x]))/b])/(2^n*E^(((2*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^
n) + (I*E^(((2*I)*a)/b)*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c*x]))/b])/(2^n*(
(I*(a + b*ArcSin[c*x]))/b)^n)) + (I*(-(((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[
1 + n, ((-4*I)*(a + b*ArcSin[c*x]))/b]) + E^(((8*I)*a)/b)*(((-I)*(a + b*Arc
Sin[c*x]))/b)^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b]))/(4^n*E^(((4*I
)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^n)))/(64*c*Sqrt[d - c^2*d*x^2])
```

Maple [F]

$$\int \left(-c^2d\,x^2+d\right)^{\frac{3}{2}}(a+b\arcsin(cx))^n\,dx$$

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x)
```

Fricas [F]

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)^n\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
[Out] integral((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n, x)
```

Sympy [F(-1)]

Timed out.

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx=\text{Timed out}$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n,x)
[Out] Timed out
```

Maxima [F]

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin(cx)+a)^n\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n, x)
```

Giac [F(-2)]

Exception generated.

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n\,dx=\int \left(a+b\,\mathrm{asin}(c\,x)\right)^n\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

```
[In] int((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2),x)
[Out] int((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2), x)
```

3.490 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 29

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x}\,dx = \frac{5d^2e^{-\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\Big(1+n$$

$$+\frac{5d^2e^{\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{8\sqrt{d-c^2dx^2}}$$

$$+\frac{3^{-1-n}d^2e^{-\frac{3ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(cx))}{b}\right)}{8\sqrt{d-c^2dx^2}}$$

$$+\frac{3^{-1-n}d^2e^{\frac{3ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(cx))}{b}\right)}{8\sqrt{d-c^2dx^2}}$$

$$+d^2\mathrm{Int}\left(\frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}},x\right)$$

```
[Out] 5/8*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^
(1/2)/exp(I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+5/8*d^2*
exp(I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1
)^(1/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+1/8*3^(-1-n)*d^2*(
a+b*arcsin(c*x))^n*GAMMA(1+n,-3*I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1/2)/e
xp(3*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+1/8*3^(-1-n)*
d^2*exp(3*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,3*I*(a+b*arcsin(c*x))/b)*(-c
^2*x^2+1)^(1/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+d^2*Uninte
grable((a+b*arcsin(c*x))^n/x/(-c^2*d*x^2+d)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.66 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x}\,dx = \int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x}\,dx$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x,x]

[Out] (5*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*Ar
cSin[c*x]))/b])/(8*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x
]))/b)^n) + (5*d^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamm
a[1 + n, (I*(a + b*ArcSin[c*x]))/b])/(8*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcS
in[c*x]))/b)^n) + (3^(-1 - n)*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*G
amma[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(8*E^(((3*I)*a)/b)*Sqrt[d - c^
2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (3^(-1 - n)*d^2*E^(((3*I)*a)/b
)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin
[c*x]))/b])/(8*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + d^2*Def
er[Int][(a + b*ArcSin[c*x])^n/(x*Sqrt[d - c^2*d*x^2]), x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{d^2(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}} - \frac{2c^2d^2x(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}} + \frac{c^4d^2x^3(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\right)dx \\
&= d^2\int \frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx - \left(2c^2d^2\right)\int \frac{x(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\,dx \\
&\quad + \left(c^4d^2\right)\int \frac{x^3(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\,dx \\
&= d^2\int \frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx \\
&\quad - \frac{\left(d^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int x^n\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)\,dx, x, a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}} \\
&\quad + \frac{\left(2d^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int x^n\sin\left(\frac{a}{b}-\frac{x}{b}\right)\,dx, x, a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= d^2 \int \frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx + \frac{\left(id^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int e^{-i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx, x, a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}} - \frac{\left(id^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int e^{i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx, x, a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}} - \frac{\left(d^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int\left(-\frac{1}{4}x^n\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)+\frac{3}{4}x^n\sin\left(\frac{a}{b}-\frac{x}{b}\right)\right)\,dx, x, a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}}$$

$$= \frac{d^2e^{-\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}} + \frac{d^2e^{\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}} + d^2\int\frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx + \frac{\left(d^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int x^n\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)\,dx, x, a+b\arcsin(cx)\right)}{4b\sqrt{d-c^2dx^2}} - \frac{\left(3d^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int x^n\sin\left(\frac{a}{b}-\frac{x}{b}\right)\,dx, x, a+b\arcsin(cx)\right)}{4b\sqrt{d-c^2dx^2}}$$

$$= \frac{d^2e^{-\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}} + \frac{d^2e^{\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}} + d^2\int\frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx + \frac{\left(id^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int e^{-i\left(\frac{3a}{b}-\frac{3x}{b}\right)}x^n\,dx, x, a+b\arcsin(cx)\right)}{8b\sqrt{d-c^2dx^2}} - \frac{\left(id^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int e^{i\left(\frac{3a}{b}-\frac{3x}{b}\right)}x^n\,dx, x, a+b\arcsin(cx)\right)}{8b\sqrt{d-c^2dx^2}} - \frac{\left(3id^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int e^{-i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx, x, a+b\arcsin(cx)\right)}{8b\sqrt{d-c^2dx^2}} + \frac{\left(3id^2\sqrt{1-c^2x^2}\right)\mathrm{Subst}\left(\int e^{i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx, x, a+b\arcsin(cx)\right)}{8b\sqrt{d-c^2dx^2}}$$

$$= \frac{5d^2e^{-\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)}{8\sqrt{d-c^2dx^2}}$$
$$+\frac{5d^2e^{\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{8\sqrt{d-c^2dx^2}}$$
$$+\frac{3^{-1-n}d^2e^{-\frac{3ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(cx))}{b}\right)}{8\sqrt{d-c^2dx^2}}$$
$$+\frac{3^{-1-n}d^2e^{\frac{3ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(cx))}{b}\right)}{8\sqrt{d-c^2dx^2}}$$
$$+d^2\int\frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.33 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x}\,dx=\int\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x}\,dx$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x,x]
[Out] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.18 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int\frac{(-c^2d\,x^2+d)^{\frac{3}{2}}(a+b\arcsin(cx))^n}{x}dx$$

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x)
[Out] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n}{x}\,dx=\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)^n}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="fricas")
[Out] integral((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n/x, x)
```

Sympy [N/A]

Not integrable

Time = 126.66 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n}{x}\,dx=\int \frac{\left(-d(cx-1)\left(cx+1\right)\right)^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^n}{x}\,dx$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n/x,x)
[Out] Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**n/x, x)
```

Maxima [N/A]

Not integrable

Time = 0.79 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n}{x}\,dx=\int \frac{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)^n}{x}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="maxima")
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n/x, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^n\,(d-c^2\,d\,x^2)^{3/2}}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2))/x, x)
```

3.491 $\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n}{x^2}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 29

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^n}{x^2}\,dx = -\frac{3cd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^{1+n}}{2b(1+n)\sqrt{d-c^2dx^2}}$$
$$+\frac{i2^{-3-n}cd^2e^{-\frac{2ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}}$$
$$-\frac{i2^{-3-n}cd^2e^{\frac{2ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}}$$
$$+d^2\mathrm{Int}\left(\frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}},x\right)$$

```
[Out] -3/2*c*d^2*(a+b*arcsin(c*x))^(1+n)*(-c^2*x^2+1)^(1/2)/b/(1+n)/(-c^2*d*x^2+d
)^(1/2)+I*2^(-3-n)*c*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-2*I*(a+b*arcsin(c*x
))/b)*(-c^2*x^2+1)^(1/2)/exp(2*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*
x^2+d)^(1/2)-I*2^(-3-n)*c*d^2*exp(2*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,2*
I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2
*d*x^2+d)^(1/2)+d^2*Unintegrable((a+b*arcsin(c*x))^n/x^2/(-c^2*d*x^2+d)^(1/
2),x)
```

Rubi [N/A]

Not integrable

Time = 0.50 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x^2}\,dx=\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x^2}\,dx$$

```
[In] Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x^2,x]
```

```
[Out] (-3*c*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(2*b*(1 + n)*Sqrt[
d - c^2*d*x^2]) + (I*2^(-3 - n)*c*d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(E^(((2*I)*a)/b)*Sqrt[d -
c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*2^(-3 - n)*c*d^2*E^(((2*I
)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b*
ArcSin[c*x]))/b])/(Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + d^2
*Defer[Int][(a + b*ArcSin[c*x])^n/(x^2*Sqrt[d - c^2*d*x^2]), x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(-\frac{2c^2d^2(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}+\frac{d^2(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}+\frac{c^4d^2x^2(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\right)dx\\
&= d^2\int \frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\,dx-\left(2c^2d^2\right)\int \frac{(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\,dx+\left(c^4d^2\right)\int \frac{x^2(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\,dx\\
&= -\frac{2cd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^{1+n}}{b(1+n)\sqrt{d-c^2dx^2}}+d^2\int \frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\,dx+\frac{\left(cd^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int x^n\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}}\\
&= -\frac{2cd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^{1+n}}{b(1+n)\sqrt{d-c^2dx^2}}+d^2\int \frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\,dx+\frac{\left(cd^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \left(\frac{x^n}{2}-\frac{1}{2}x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\right)dx,x,a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}}\\
&= -\frac{3cd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^{1+n}}{2b(1+n)\sqrt{d-c^2dx^2}}+d^2\int \frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\,dx-\frac{\left(cd^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{2b\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= -\frac{3cd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^{1+n}}{2b(1+n)\sqrt{d-c^2dx^2}} + d^2\int\frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\,dx$$
$$-\frac{\left(cd^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{4b\sqrt{d-c^2dx^2}}$$
$$-\frac{\left(cd^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int e^{i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{4b\sqrt{d-c^2dx^2}}$$
$$= -\frac{3cd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^{1+n}}{2b(1+n)\sqrt{d-c^2dx^2}}$$
$$+\frac{i2^{-3-n}cd^2e^{-\frac{2ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}}$$
$$-\frac{i2^{-3-n}cd^2e^{\frac{2ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}}$$
$$+d^2\int\frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 1.04 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x^2}\,dx = \int\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x^2}\,dx$$

```
[In] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x^2,x]
[Out] Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^n)/x^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.18 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int\frac{(-c^2d\,x^2+d)^{\frac{3}{2}}(a+b\arcsin(cx))^n}{x^2}dx$$

```
[In] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x)
[Out] int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x^2}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^n}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="fricas
")
[Out] integral((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x^2}\,dx = \text{Timed out}$$

```
[In] integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**n/x**2,x)
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 0.79 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^n}{x^2}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^n}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="maxima
")
[Out] integrate((-c^2*d*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d - c^2 dx^2)^{3/2} (a + b \arcsin(cx))^n}{x^2} dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.14 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{(d - c^2 dx^2)^{3/2} (a + b \arcsin(cx))^n}{x^2} dx = \int \frac{(a + b \operatorname{asin}(c x))^n (d - c^2 d x^2)^{3/2}}{x^2} dx$$

```
[In] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2))/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(3/2))/x^2, x)
```

3.492 $\int x^2(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n\,dx$

Optimal result

Integrand size = 29, antiderivative size = 906

$$\int x^2\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^n\,dx=\frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{128bc^3(1+n)\sqrt{1-c^2x^2}}$$
$$-\frac{i2^{-7-n}d^2e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$+\frac{i2^{-7-n}d^2e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$+\frac{i2^{-2(4+n)}d^2e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$-\frac{i2^{-2(4+n)}d^2e^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$+\frac{i2^{-7-n}3^{-1-n}d^2e^{-\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{6i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$-\frac{i2^{-7-n}3^{-1-n}d^2e^{\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{6i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$+\frac{i2^{-11-3n}d^2e^{-\frac{8ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{8i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$-\frac{i2^{-11-3n}d^2e^{\frac{8ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{8i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$

```
[Out] 5/128*d^2*(a+b*arcsin(c*x))^(1+n)*(-c^2*d*x^2+d)^(1/2)/b/c^3/(1+n)/(-c^2*x^
2+1)^(1/2)-I*2^(-7-n)*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-2*I*(a+b*arcsin(c*
x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/exp(2*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(
-c^2*x^2+1)^(1/2)+I*2^(-7-n)*d^2*exp(2*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n
,2*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/((I*(a+b*arcsin(c*x))/b)
^n)/(-c^2*x^2+1)^(1/2)+I*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-4*I*(a+b*arcsin
(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/(2^(8+2*n))/c^3/exp(4*I*a/b)/((-I*(a+b*arcsi
n(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-I*d^2*exp(4*I*a/b)*(a+b*arcsin(c*x))^n*GAM
MA(1+n,4*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/(2^(8+2*n))/c^3/((I*(a
+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)+I*2^(-7-n)*3^(-1-n)*d^2*(a+b*arcsi
n(c*x))^n*GAMMA(1+n,-6*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/exp(
6*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-I*2^(-7-n)*3^(-1-n
)*d^2*exp(6*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,6*I*(a+b*arcsin(c*x))/b)*(
-c^2*d*x^2+d)^(1/2)/c^3/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)+I*2^
(-11-3*n)*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-8*I*(a+b*arcsin(c*x))/b)*(-c^2
*d*x^2+d)^(1/2)/c^3/exp(8*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^
(1/2)-I*2^(-11-3*n)*d^2*exp(8*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,8*I*(a+b
*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^3/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2
*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 906, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.138$, Rules used

$= \{4809, 4491, 3388, 2212\}$

$$\int x^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^n\,dx =$$

$$-\frac{i2^{-n-7}d^2e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\Gamma\left(n+1,-\frac{2i(a+b\arcsin(cx))}{b}\right)\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}}{c^3\sqrt{1-c^2x^2}}$$
$$+\frac{i2^{-2(n+4)}d^2e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\Gamma\left(n+1,-\frac{4i(a+b\arcsin(cx))}{b}\right)\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}}{c^3\sqrt{1-c^2x^2}}$$
$$+\frac{i2^{-n-7}3^{-n-1}d^2e^{-\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\Gamma\left(n+1,-\frac{6i(a+b\arcsin(cx))}{b}\right)\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}}{c^3\sqrt{1-c^2x^2}}$$
$$+\frac{i2^{-3n-11}d^2e^{-\frac{8ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\Gamma\left(n+1,-\frac{8i(a+b\arcsin(cx))}{b}\right)\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}}{c^3\sqrt{1-c^2x^2}}$$
$$+\frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{n+1}}{128bc^3(n+1)\sqrt{1-c^2x^2}}$$
$$+\frac{i2^{-n-7}d^2e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$-\frac{i2^{-2(n+4)}d^2e^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$-\frac{i2^{-n-7}3^{-n-1}d^2e^{\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{6i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$
$$-\frac{i2^{-3n-11}d^2e^{\frac{8ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{8i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}$$

```
[In] Int[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(128*b*c^3*(1 + n)*
Sqrt[1 - c^2*x^2]) - (I*2^(-7 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*
x])^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((2*I)*a)/b)*Sq
rt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*d^2*E^(((
2*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a
 + b*ArcSin[c*x]))/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n
) + (I*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)*(
a + b*ArcSin[c*x]))/b])/(2^(2*(4 + n))*c^3*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2
]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*d^2*E^(((4*I)*a)/b)*Sqrt[d - c^2*d
*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(2
^(2*(4 + n))*c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-
7 - n)*3^(-1 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n
, ((-6*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((6*I)*a)/b)*Sqrt[1 - c^2*x^2]*(
```

```
((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*2^(-7 - n)*3^(-1 - n)*d^2*E^(((6*I)*a
)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((6*I)*(a + b*A
rcSin[c*x]))/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I
*2^(-11 - 3*n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, (
(-8*I)*(a + b*ArcSin[c*x]))/b])/(c^3*E^(((8*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-
I)*(a + b*ArcSin[c*x]))/b)^n) - (I*2^(-11 - 3*n)*d^2*E^(((8*I)*a)/b)*Sqrt[d
 - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((8*I)*(a + b*ArcSin[c*x])
)/b])/(c^3*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos^6\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{bc^3\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{5x^n}{128}-\frac{1}{128}x^n\cos\left(\frac{8a}{b}-\frac{8x}{b}\right)-\frac{1}{32}x^n\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)-\frac{1}{32}x^n\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)+\frac{1}{32}\right.\right.}{bc^3\sqrt{1-c^2x^2}}$$

$$= \frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{128bc^3(1+n)\sqrt{1-c^2x^2}} - \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos\left(\frac{8a}{b}-\frac{8x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{128bc^3\sqrt{1-c^2x^2}} - \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{32bc^3\sqrt{1-c^2x^2}} - \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{32bc^3\sqrt{1-c^2x^2}} + \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{32bc^3\sqrt{1-c^2x^2}}$$

$$= \frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{128bc^3(1+n)\sqrt{1-c^2x^2}} - \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{8a}{b}-\frac{8x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{256bc^3\sqrt{1-c^2x^2}} - \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{8a}{b}-\frac{8x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{256bc^3\sqrt{1-c^2x^2}} - \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{6a}{b}-\frac{6x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{64bc^3\sqrt{1-c^2x^2}} - \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{6a}{b}-\frac{6x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{64bc^3\sqrt{1-c^2x^2}} - \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{4a}{b}-\frac{4x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{64bc^3\sqrt{1-c^2x^2}} - \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{4a}{b}-\frac{4x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{64bc^3\sqrt{1-c^2x^2}} + \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{64bc^3\sqrt{1-c^2x^2}} + \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{64bc^3\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{128bc^3(1+n)\sqrt{1-c^2x^2}} \\
&- \frac{i2^{-7-n}d^2e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}} \\
&+ \frac{i2^{-7-n}d^2e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}} \\
&+ \frac{i4^{-4-n}d^2e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}} \\
&- \frac{i4^{-4-n}d^2e^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}} \\
&+ \frac{i2^{-7-n}3^{-1-n}d^2e^{-\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{6i(a+b\arcsin(cx))}{b}\right.}{c^3\sqrt{1-c^2x^2}} \\
&- \frac{i2^{-7-n}3^{-1-n}d^2e^{\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{6i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}} \\
&+ \frac{i2^{-11-3n}d^2e^{-\frac{8ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{8i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}} \\
&- \frac{i2^{-11-3n}d^2e^{\frac{8ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{8i(a+b\arcsin(cx))}{b}\right)}{c^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 3.38 (sec) , antiderivative size = 989, normalized size of antiderivative = 1.09

$$
\int x^2\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^n\,dx = \frac{2^{-11-3n}3^{-1-n}d^3e^{-\frac{8ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{(a+b\arcsin(cx))^2}{b^2}\right)^{-n}\left(5\,2^{4+3n}3^{1+n}ae^{\frac{8ia}{b}}\right.}{}
$$

```
[In] Integrate[x^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (2^(-11 - 3*n)*3^(-1 - n)*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*(5*2^
(4 + 3*n)*3^(1 + n)*a*E^(((8*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^n + 5*2^(
4 + 3*n)*3^(1 + n)*b*E^(((8*I)*a)/b)*ArcSin[c*x]*((a + b*ArcSin[c*x])^2/b^2
)^n - I*3^(1 + n)*4^(2 + n)*b*E^(((6*I)*a)/b)*(1 + n)*((I*(a + b*ArcSin[c*x
]))/b)^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b] + I*3^(1 + n)*4^(2 +
n)*b*E^(((10*I)*a)/b)*(1 + n)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n,
 ((2*I)*(a + b*ArcSin[c*x]))/b] + I*2^(3 + n)*3^(1 + n)*b*E^(((4*I)*a)/b)*(
```

```
(I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-4*I)*(a + b*ArcSin[c*x]))/b] +
 I*2^(3 + n)*3^(1 + n)*b*E^(((4*I)*a)/b)*n*((I*(a + b*ArcSin[c*x]))/b)^n*Ga
mma[1 + n, ((-4*I)*(a + b*ArcSin[c*x]))/b] - I*2^(3 + n)*3^(1 + n)*b*E^(((1
2*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((4*I)*(a + b*ArcS
in[c*x]))/b] - I*2^(3 + n)*3^(1 + n)*b*E^(((12*I)*a)/b)*n*(((-I)*(a + b*Arc
Sin[c*x]))/b)^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b] + I*4^(2 + n)*b
*E^(((2*I)*a)/b)*((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-6*I)*(a + b*
ArcSin[c*x]))/b] + I*4^(2 + n)*b*E^(((2*I)*a)/b)*n*((I*(a + b*ArcSin[c*x]))
/b)^n*Gamma[1 + n, ((-6*I)*(a + b*ArcSin[c*x]))/b] - I*4^(2 + n)*b*E^(((14*
I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin
[c*x]))/b] - I*4^(2 + n)*b*E^(((14*I)*a)/b)*n*(((-I)*(a + b*ArcSin[c*x]))/b
)^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin[c*x]))/b] + I*3^(1 + n)*b*((I*(a + b*
ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-8*I)*(a + b*ArcSin[c*x]))/b] + I*3^(1 +
n)*b*n*((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-8*I)*(a + b*ArcSin[c*x
]))/b] - I*3^(1 + n)*b*E^(((16*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Ga
mma[1 + n, ((8*I)*(a + b*ArcSin[c*x]))/b] - I*3^(1 + n)*b*E^(((16*I)*a)/b)*
n*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((8*I)*(a + b*ArcSin[c*x]))
/b]))/(b*c^3*E^(((8*I)*a)/b)*(1 + n)*Sqrt[d - c^2*d*x^2]*((a + b*ArcSin[c*x
])^2/b^2)^n)
```

Maple [F]

$$\int x^{2} \left(-c^{2} d \,x^{2}+d \right)^{\frac{5}{2}} \left(a +b \arcsin \left(c x \right)\right)^{n}d x$$

```
[In] int(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
[Out] int(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

Fricas [F]

$$\int x^2 \left(d-c^2 d x^2\right)^{5/2} (a+b \arcsin (c x))^n \, dx=\int { {\left(-c^{2} d x^{2} + d\right)}^{\frac{5}{2}} {\left(b \arcsin \left(c x\right) + a\right)}^{n} x^{2} \,d x }$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas
")
[Out] integral((c^4*d^2*x^6 - 2*c^2*d^2*x^4 + d^2*x^2)*sqrt(-c^2*d*x^2 + d)*(b*ar
csin(c*x) + a)^n, x)
```

Sympy [F(-1)]

Timed out.

$$\int x^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^n\,dx = \text{Timed out}$$

```
[In] integrate(x**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n,x)
[Out] Timed out
```

Maxima [F]

$$\int x^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^n\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}} (b\arcsin(cx)+a)^n x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima
")
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Giac [F]

$$\int x^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^n\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}} (b\arcsin(cx)+a)^n x^2\,dx$$

```
[In] integrate(x^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n*x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^n\,dx = \int x^2\,(a+b\,\mathrm{asin}(c\,x))^n\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int(x^2*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2),x)
[Out] int(x^2*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2), x)
```

3.493 $\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n\,dx$

Optimal result

Integrand size = 27, antiderivative size = 815

$$\int x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^n\,dx = -\frac{5d^2e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}} - \frac{5d^2e^{\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}} - \frac{3^{1-n}d^2e^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}} - \frac{3^{1-n}d^2e^{\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}} - \frac{5^{-n}d^2e^{-\frac{5ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{5i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}} - \frac{5^{-n}d^2e^{\frac{5ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{5i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}} - \frac{7^{-1-n}d^2e^{-\frac{7ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{7i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}} - \frac{7^{-1-n}d^2e^{\frac{7ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{7i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}}$$

```
[Out] -5/128*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^
2+d)^(1/2)/c^2/exp(I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-5
```

```
/128*d^2*exp(I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,I*(a+b*arcsin(c*x))/b)*(-
c^2*d*x^2+d)^(1/2)/c^2/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/128
*3^(1-n)*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-3*I*(a+b*arcsin(c*x))/b)*(-c^2*
d*x^2+d)^(1/2)/c^2/exp(3*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(
1/2)-1/128*3^(1-n)*d^2*exp(3*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,3*I*(a+b*
arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^2/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*
x^2+1)^(1/2)-1/128*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-5*I*(a+b*arcsin(c*x))
/b)*(-c^2*d*x^2+d)^(1/2)/(5^n)/c^2/exp(5*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n
)/(-c^2*x^2+1)^(1/2)-1/128*d^2*exp(5*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,5
*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/(5^n)/c^2/((I*(a+b*arcsin(c*x)
)/b)^n)/(-c^2*x^2+1)^(1/2)-1/128*7^(-1-n)*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n
,-7*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^2/exp(7*I*a/b)/((-I*(a+b*
arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-1/128*7^(-1-n)*d^2*exp(7*I*a/b)*(a+b*
arcsin(c*x))^n*GAMMA(1+n,7*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c^2/
((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 815, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used

$= \{4809, 4491, 3389, 2212\}$

$$\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n\,dx =$$

$$-\frac{5d^2e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\Gamma\left(n+1,-\frac{i(a+b\arcsin(cx))}{b}\right)\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}}{128c^2\sqrt{1-c^2x^2}}$$
$$-\frac{3^{1-n}d^2e^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\Gamma\left(n+1,-\frac{3i(a+b\arcsin(cx))}{b}\right)\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}}{128c^2\sqrt{1-c^2x^2}}$$
$$-\frac{5^{-n}d^2e^{-\frac{5ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\Gamma\left(n+1,-\frac{5i(a+b\arcsin(cx))}{b}\right)\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}}{128c^2\sqrt{1-c^2x^2}}$$
$$-\frac{7^{-n-1}d^2e^{-\frac{7ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\Gamma\left(n+1,-\frac{7i(a+b\arcsin(cx))}{b}\right)\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}}{128c^2\sqrt{1-c^2x^2}}$$
$$-\frac{5d^2e^{\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}}$$
$$-\frac{3^{1-n}d^2e^{\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{3i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}}$$
$$-\frac{5^{-n}d^2e^{\frac{5ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{5i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}}$$
$$-\frac{7^{-n-1}d^2e^{\frac{7ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{7i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}}$$

```
[In] Int[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (-5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b
*ArcSin[c*x]))/b])/(128*c^2*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*Arc
Sin[c*x]))/b)^n) - (5*d^2*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x
])^n*Gamma[1 + n, (I*(a + b*ArcSin[c*x]))/b])/(128*c^2*Sqrt[1 - c^2*x^2]*((
I*(a + b*ArcSin[c*x]))/b)^n) - (3^(1 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*Ar
cSin[c*x])^n*Gamma[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(128*c^2*E^(((3*
I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (3^(1 - n)*d
^2*E^(((3*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, (
(3*I)*(a + b*ArcSin[c*x]))/b])/(128*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin
[c*x]))/b)^n) - (d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n,
 ((-5*I)*(a + b*ArcSin[c*x]))/b])/(128*5^n*c^2*E^(((5*I)*a)/b)*Sqrt[1 - c^2
*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (d^2*E^(((5*I)*a)/b)*Sqrt[d - c^2
*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((5*I)*(a + b*ArcSin[c*x]))/b])/
(128*5^n*c^2*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (7^(-1 - n)
*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-7*I)*(a + b*
```

```
ArcSin[c*x]))/b])/(128*c^2*E^(((7*I)*a)/b)*Sqrt[1 - c^2*x^2]*(((-I)*(a + b*
ArcSin[c*x]))/b)^n) - (7^(-1 - n)*d^2*E^(((7*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(
a + b*ArcSin[c*x])^n*Gamma[1 + n, ((7*I)*(a + b*ArcSin[c*x]))/b])/(128*c^2*
Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3389

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos^6\left(\frac{a}{b}-\frac{x}{b}\right)\sin\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{bc^2\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{1}{64}x^n\sin\left(\frac{7a}{b}-\frac{7x}{b}\right)+\frac{5}{64}x^n\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)+\frac{9}{64}x^n\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)+\frac{5}{64}x^n\text{si}\right.\right.}{bc^2\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\sin\left(\frac{7a}{b}-\frac{7x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{64bc^2\sqrt{1-c^2x^2}}$$
$$-\frac{\left(5d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{64bc^2\sqrt{1-c^2x^2}}$$
$$-\frac{\left(5d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\sin\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{64bc^2\sqrt{1-c^2x^2}}$$
$$-\frac{\left(9d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{64bc^2\sqrt{1-c^2x^2}}$$

$$= -\frac{\left(id^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{7a}{b}-\frac{7x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{128bc^2\sqrt{1-c^2x^2}}$$
$$+\frac{\left(id^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{7a}{b}-\frac{7x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{128bc^2\sqrt{1-c^2x^2}}$$
$$-\frac{\left(5id^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{5a}{b}-\frac{5x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{128bc^2\sqrt{1-c^2x^2}}$$
$$+\frac{\left(5id^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{5a}{b}-\frac{5x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{128bc^2\sqrt{1-c^2x^2}}$$
$$-\frac{\left(5id^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{128bc^2\sqrt{1-c^2x^2}}$$
$$+\frac{\left(5id^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{128bc^2\sqrt{1-c^2x^2}}$$
$$-\frac{\left(9id^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{3a}{b}-\frac{3x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{128bc^2\sqrt{1-c^2x^2}}$$
$$+\frac{\left(9id^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{3a}{b}-\frac{3x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{128bc^2\sqrt{1-c^2x^2}}$$

$$= -\frac{5d^2e^{-\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}}$$
$$-\frac{5d^2e^{\frac{ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}}$$
$$-\frac{3^{1-n}d^2e^{-\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}}$$
$$-\frac{3^{1-n}d^2e^{\frac{3ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}}$$
$$-\frac{5^{-n}d^2e^{-\frac{5ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{5i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}}$$
$$-\frac{5^{-n}d^2e^{\frac{5ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{5i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}}$$
$$-\frac{7^{-1-n}d^2e^{-\frac{7ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{7i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}}$$
$$-\frac{7^{-1-n}d^2e^{\frac{7ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{7i(a+b\arcsin(cx))}{b}\right)}{128c^2\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 2.82 (sec) , antiderivative size = 603, normalized size of antiderivative = 0.74

$$\int x\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^n\,dx =$$
$$-\frac{5^{-n}21^{-1-n}d^3e^{-\frac{7ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{(a+b\arcsin(cx))^2}{b^2}\right)^{-3n}\left(105^{1+n}e^{\frac{6ia}{b}}\left(\frac{i(a+b\arcsin(cx))}{b}\right)^n\left(\frac{(a+b\arcsin}{b^2}\right.\right.}{}$$

```
[In] Integrate[x*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] -1/128*(21^(-1 - n)*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*(105^(1 + n
)*E^(((6*I)*a)/b)*((I*(a + b*ArcSin[c*x]))/b)^n*((a + b*ArcSin[c*x])^2/b^2)
^(2*n)*Gamma[1 + n, ((-I)*(a + b*ArcSin[c*x]))/b] + (((-I)*(a + b*ArcSin[c*
x]))/b)^n*(105^(1 + n)*E^(((8*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^(2*n)*Ga
mma[1 + n, (I*(a + b*ArcSin[c*x]))/b] + 9*5^n*7^(1 + n)*E^(((4*I)*a)/b)*((I
*(a + b*ArcSin[c*x]))/b)^(2*n)*((a + b*ArcSin[c*x])^2/b^2)^n*Gamma[1 + n, (
(-3*I)*(a + b*ArcSin[c*x]))/b] + 9*5^n*7^(1 + n)*E^(((10*I)*a)/b)*((a + b*A
rcSin[c*x])^2/b^2)^(2*n)*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b] + 3^(1
 + n)*(7^(1 + n)*E^(((2*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*((I*(a +
```

```
b*ArcSin[c*x]))/b)^(3*n)*Gamma[1 + n, ((-5*I)*(a + b*ArcSin[c*x]))/b] + 7^(
1 + n)*E^(((12*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^(2*n)*Gamma[1 + n, ((5*
I)*(a + b*ArcSin[c*x]))/b] + 5^n*((((-I)*(a + b*ArcSin[c*x]))/b)^n*((I*(a +
 b*ArcSin[c*x]))/b)^(3*n)*Gamma[1 + n, ((-7*I)*(a + b*ArcSin[c*x]))/b] + E^
(((14*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^(2*n)*Gamma[1 + n, ((7*I)*(a + b
*ArcSin[c*x]))/b])))))/(5^n*c^2*E^(((7*I)*a)/b)*Sqrt[d - c^2*d*x^2]*((a + b
*ArcSin[c*x])^2/b^2)^(3*n))
```

Maple [F]

$$\int x\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}} \left(a +b \arcsin \left(c x \right)\right)^{n}d x$$

```
[In] int(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
[Out] int(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

Fricas [F]

$$\int x\left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^n\,dx = \int \left(-c^{2} d x^{2} + d\right)^{\frac{5}{2}} {\left(b \arcsin \left(c x\right) + a\right)}^{n} x \,d x$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
[Out] integral((c^4*d^2*x^5 - 2*c^2*d^2*x^3 + d^2*x)*sqrt(-c^2*d*x^2 + d)*(b*arcs
in(c*x) + a)^n, x)
```

Sympy [F(-1)]

Timed out.

$$\int x\left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^n\,dx = \text{Timed out}$$

```
[In] integrate(x*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n,x)
[Out] Timed out
```

Maxima [F]

$$\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n\,dx=\int(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)^nx\,dx$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n*x, x)
```

Giac [F(-2)]

Exception generated.

$$\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int x(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n\,dx=\int x\,(a+b\,\mathrm{asin}(c\,x))^n\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int(x*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2),x)
[Out] int(x*(a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2), x)
```

3.494 $\int (d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n\,dx$

Optimal result

Integrand size = 26, antiderivative size = 698

$$\int (d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n\,dx = \frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{16bc(1+n)\sqrt{1-c^2x^2}}$$
$$-\frac{15i2^{-7-n}d^2e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$+\frac{15i2^{-7-n}d^2e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$-\frac{3i2^{-7-2n}d^2e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$+\frac{3i2^{-7-2n}d^2e^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$-\frac{i2^{-7-n}3^{-1-n}d^2e^{-\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{6i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$+\frac{i2^{-7-n}3^{-1-n}d^2e^{\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{6i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$

```
[Out] 5/16*d^2*(a+b*arcsin(c*x))^(1+n)*(-c^2*d*x^2+d)^(1/2)/b/c/(1+n)/(-c^2*x^2+1
)^(1/2)-15*I*2^(-7-n)*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-2*I*(a+b*arcsin(c*
x))/b)*(-c^2*d*x^2+d)^(1/2)/c/exp(2*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c
^2*x^2+1)^(1/2)+15*I*2^(-7-n)*d^2*exp(2*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+
n,2*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c/((I*(a+b*arcsin(c*x))/b)^
n)/(-c^2*x^2+1)^(1/2)-3*I*2^(-7-2*n)*d^2*(a+b*arcsin(c*x))^n*GAMMA(1+n,-4*I
```

```
*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c/exp(4*I*a/b)/((-I*(a+b*arcsin(
c*x))/b)^n)/(-c^2*x^2+1)^(1/2)+3*I*2^(-7-2*n)*d^2*exp(4*I*a/b)*(a+b*arcsin(
c*x))^n*GAMMA(1+n,4*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c/((I*(a+b*
arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)-I*2^(-7-n)*3^(-1-n)*d^2*(a+b*arcsin(c
*x))^n*GAMMA(1+n,-6*I*(a+b*arcsin(c*x))/b)*(-c^2*d*x^2+d)^(1/2)/c/exp(6*I*a
/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)+I*2^(-7-n)*3^(-1-n)*d^2
*exp(6*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,6*I*(a+b*arcsin(c*x))/b)*(-c^2*
d*x^2+d)^(1/2)/c/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 698, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {4753, 3393, 3388, 2212}

$$\int \left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^n\,dx = \frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{n+1}}{16bc(n+1)\sqrt{1-c^2x^2}}$$
$$-\frac{15id^2 2^{-n-7}e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$-\frac{3id^2 2^{-2n-7}e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$-\frac{id^2 2^{-n-7}3^{-n-1}e^{-\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{6i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$+\frac{15id^2 2^{-n-7}e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$+\frac{3id^2 2^{-2n-7}e^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$
$$+\frac{id^2 2^{-n-7}3^{-n-1}e^{\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{6i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$

```
[In] Int[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (5*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(16*b*c*(1 + n)*Sqr
t[1 - c^2*x^2]) - ((15*I)*2^(-7 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[
c*x])^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((2*I)*a)/b)*Sq
rt[1 - c^2*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + ((15*I)*2^(-7 - n)*d^2*
E^(((2*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*
I)*(a + b*ArcSin[c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b
)^n) - ((3*I)*2^(-7 - 2*n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Ga
```

```
mma[1 + n, ((-4*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((4*I)*a)/b)*Sqrt[1 - c^2
*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + ((3*I)*2^(-7 - 2*n)*d^2*E^(((4*I)
*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b
*ArcSin[c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) - (I
*2^(-7 - n)*3^(-1 - n)*d^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[
1 + n, ((-6*I)*(a + b*ArcSin[c*x]))/b])/(c*E^(((6*I)*a)/b)*Sqrt[1 - c^2*x^2
]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (I*2^(-7 - n)*3^(-1 - n)*d^2*E^(((6*I
)*a)/b)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((6*I)*(a +
b*ArcSin[c*x]))/b])/(c*Sqrt[1 - c^2*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4753

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Dist[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Subst[Int[x
^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
 c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos^6\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{bc\sqrt{1-c^2x^2}}$$

$$=\frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int\left(\frac{5x^n}{16}+\frac{1}{32}x^n\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)+\frac{3}{16}x^n\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)+\frac{15}{32}x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\right)\,dx\right.}{bc\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{16bc(1+n)\sqrt{1-c^2x^2}} \\
&+ \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos\left(\frac{6a}{b}-\frac{6x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{32bc\sqrt{1-c^2x^2}} \\
&+ \frac{\left(3d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{16bc\sqrt{1-c^2x^2}} \\
&+ \frac{\left(15d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{32bc\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{16bc(1+n)\sqrt{1-c^2x^2}} \\
&+ \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{6a}{b}-\frac{6x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{64bc\sqrt{1-c^2x^2}} \\
&+ \frac{\left(d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{6a}{b}-\frac{6x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{64bc\sqrt{1-c^2x^2}} \\
&+ \frac{\left(3d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{4a}{b}-\frac{4x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{32bc\sqrt{1-c^2x^2}} \\
&+ \frac{\left(3d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{4a}{b}-\frac{4x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{32bc\sqrt{1-c^2x^2}} \\
&+ \frac{\left(15d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{64bc\sqrt{1-c^2x^2}} \\
&+ \frac{\left(15d^2\sqrt{d-c^2dx^2}\right)\text{Subst}\left(\int e^{i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{64bc\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{5d^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^{1+n}}{16bc(1+n)\sqrt{1-c^2x^2}} - \frac{15i2^{-7-n}d^2e^{-\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}} + \frac{15i2^{-7-n}d^2e^{\frac{2ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}} - \frac{3i2^{-7-2n}d^2e^{-\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}} + \frac{3i2^{-7-2n}d^2e^{\frac{4ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{4i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}} - \frac{i2^{-7-n}3^{-1-n}d^2e^{-\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{6i(a+b\arcsin(cx}{b}\right.}{c\sqrt{1-c^2x^2}} + \frac{i2^{-7-n}3^{-1-n}d^2e^{\frac{6ia}{b}}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{6i(a+b\arcsin(cx))}{b}\right)}{c\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 3.82 (sec) , antiderivative size = 477, normalized size of antiderivative = 0.68

$$\int \left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^n\,dx = \frac{d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{120a}{b+bn}+\frac{120\arcsin(cx)}{1+n}-45i2^{-n}e^{-\frac{2ia}{b}}\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\right.}{}$$

```
[In] Integrate[(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n,x]
```

```
[Out] (d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*((120*a)/(b + b*n) + (120*ArcS
in[c*x])/(1 + n) - ((45*I)*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(2
^n*E^(((2*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + ((45*I)*E^(((2*I)*a)
/b)*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c*x]))/b])/(2^n*((I*(a + b*ArcSin[c*x
]))/b)^n) - ((9*I)*((I*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-4*I)*(a +
b*ArcSin[c*x]))/b])/(4^n*E^(((4*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^n) + (
(9*I)*E^(((4*I)*a)/b)*(((-I)*(a + b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((4*I)*
(a + b*ArcSin[c*x]))/b])/(4^n*((a + b*ArcSin[c*x])^2/b^2)^n) - (I*((I*(a +
b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((-6*I)*(a + b*ArcSin[c*x]))/b])/(6^n*E^(
((6*I)*a)/b)*((a + b*ArcSin[c*x])^2/b^2)^n) + (I*E^(((6*I)*a)/b)*(((-I)*(a
+ b*ArcSin[c*x]))/b)^n*Gamma[1 + n, ((6*I)*(a + b*ArcSin[c*x]))/b])/(6^n*((
a + b*ArcSin[c*x])^2/b^2)^n)))/(384*c*Sqrt[d - c^2*d*x^2])
```

Maple [F]

$$\int \left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}} \left(a+b \arcsin \left(c x\right)\right)^{n}d x$$

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

```
[Out] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x)
```

Fricas [F]

$$\int \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^n\,dx = \int \left(-c^{2} d x^{2} + d\right)^{\frac{5}{2}} {\left(b \arcsin\left(c x\right) + a\right)}^{n}\,{d x}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="fricas")
```

```
[Out] integral((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(-c^2*d*x^2 + d)*(b*arcsin
(c*x) + a)^n, x)
```

Sympy [F(-1)]

Timed out.

$$\int \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^n\,dx = \text{Timed out}$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^n\,dx = \int \left(-c^{2} d x^{2} + d\right)^{\frac{5}{2}} {\left(b \arcsin\left(c x\right) + a\right)}^{n}\,{d x}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n, x)
```

Giac [F(-2)]

Exception generated.

$$\int \left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^n\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^n\,dx = \int (a+b\,\mathrm{asin}(c\,x))^n\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

```
[In] int((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2), x)
```

3.495 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 29

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x}\,dx = \frac{11d^3e^{-\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+\right.}{16\sqrt{d-c^2dx^2}}$$

$$+\frac{11d^3e^{\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{16\sqrt{d-c^2dx^2}}$$

$$-\frac{5\,3^{-1-n}d^3e^{-\frac{3ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(cx))}{b}\right)}{32\sqrt{d-c^2dx^2}}$$

$$+\frac{3^{-n}d^3e^{-\frac{3ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(cx))}{b}\right)}{8\sqrt{d-c^2dx^2}}$$

$$-\frac{5\,3^{-1-n}d^3e^{\frac{3ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(cx))}{b}\right)}{32\sqrt{d-c^2dx^2}}$$

$$+\frac{3^{-n}d^3e^{\frac{3ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(cx))}{b}\right)}{8\sqrt{d-c^2dx^2}}$$

$$+\frac{5^{-1-n}d^3e^{-\frac{5ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{5i(a+b\arcsin(cx))}{b}\right)}{32\sqrt{d-c^2dx^2}}$$

$$+\frac{5^{-1-n}d^3e^{\frac{5ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{5i(a+b\arcsin(cx))}{b}\right)}{32\sqrt{d-c^2dx^2}}$$

$$+d^3\mathrm{Int}\left(\frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}},x\right)$$

```
[Out] 11/16*d^3*(a+b*arcsin(c*x))^n*GAMMA(1+n,-I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1
)^(1/2)/exp(I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+11/16*
d^3*exp(I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,I*(a+b*arcsin(c*x))/b)*(-c^2*x
^2+1)^(1/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)-5/32*3^(-1-n)*
d^3*(a+b*arcsin(c*x))^n*GAMMA(1+n,-3*I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1
/2)/exp(3*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+1/8*d^3*
(a+b*arcsin(c*x))^n*GAMMA(1+n,-3*I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1/2)/
(3^n)/exp(3*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)-5/32*3
^(-1-n)*d^3*exp(3*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,3*I*(a+b*arcsin(c*x)
)/b)*(-c^2*x^2+1)^(1/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+1/
8*d^3*exp(3*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,3*I*(a+b*arcsin(c*x))/b)*(
-c^2*x^2+1)^(1/2)/(3^n)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+1/
32*5^(-1-n)*d^3*(a+b*arcsin(c*x))^n*GAMMA(1+n,-5*I*(a+b*arcsin(c*x))/b)*(-c
^2*x^2+1)^(1/2)/exp(5*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d)^(1
/2)+1/32*5^(-1-n)*d^3*exp(5*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,5*I*(a+b*a
rcsin(c*x))/b)*(-c^2*x^2+1)^(1/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d*x^2+d
)^(1/2)+d^3*Unintegrable((a+b*arcsin(c*x))^n/x/(-c^2*d*x^2+d)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 1.06 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x}\,dx=\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x}\,dx$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x,x]
```

```
[Out] (11*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-I)*(a + b*A
rcSin[c*x]))/b])/(16*E^((I*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c
*x]))/b)^n) + (11*d^3*E^((I*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*G
amma[1 + n, (I*(a + b*ArcSin[c*x]))/b])/(16*Sqrt[d - c^2*d*x^2]*((I*(a + b*
ArcSin[c*x]))/b)^n) - (5*3^(-1 - n)*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
])^n*Gamma[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(32*E^(((3*I)*a)/b)*Sqrt
[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (d^3*Sqrt[1 - c^2*x^2]*
(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-3*I)*(a + b*ArcSin[c*x]))/b])/(8*3^n*
E^(((3*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (5*
3^(-1 - n)*d^3*E^(((3*I)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamm
a[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b])/(32*Sqrt[d - c^2*d*x^2]*((I*(a + b
*ArcSin[c*x]))/b)^n) + (d^3*E^(((3*I)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x])^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c*x]))/b])/(8*3^n*Sqrt[d - c^2*d
*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (5^(-1 - n)*d^3*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])^n*Gamma[1 + n, ((-5*I)*(a + b*ArcSin[c*x]))/b])/(32*E^(((
```

```
5*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) + (5^(-1 -
 n)*d^3*E^(((5*I)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n
, ((5*I)*(a + b*ArcSin[c*x]))/b])/(32*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin
[c*x]))/b)^n) + d^3*Defer[Int][(a + b*ArcSin[c*x])^n/(x*Sqrt[d - c^2*d*x^2]
), x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{d^3(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}-\frac{3c^2d^3x(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}+\frac{3c^4d^3x^3(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}-\frac{c^6d^3x^5(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\right)dx\\
&= d^3\int \frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx-\left(3c^2d^3\right)\int \frac{x(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\,dx\\
&\quad+\left(3c^4d^3\right)\int \frac{x^3(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\,dx-\left(c^6d^3\right)\int \frac{x^5(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\,dx\\
&= d^3\int \frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx\\
&\quad+\frac{\left(d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int x^n\sin^5\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(3d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int x^n\sin\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(3d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int x^n\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}}\\
&= d^3\int \frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx\\
&\quad+\frac{\left(3id^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{2b\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(3id^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int e^{i\left(\frac{a}{b}-\frac{x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{2b\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \left(\frac{1}{16}x^n\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)-\frac{5}{16}x^n\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)+\frac{5}{8}x^n\sin\left(\frac{a}{b}-\frac{x}{b}\right)\right)\,dx,x,a+b\right.}{b\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(3d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \left(-\frac{1}{4}x^n\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)+\frac{3}{4}x^n\sin\left(\frac{a}{b}-\frac{x}{b}\right)\right)\,dx,x,a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$= \frac{3d^3 e^{-\frac{ia}{b}} \sqrt{1-c^2x^2}(a+b\arcsin(cx))^n \left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n} \Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)}{2\sqrt{d-c^2dx^2}}$$
$$+ \frac{3d^3 e^{\frac{ia}{b}} \sqrt{1-c^2x^2}(a+b\arcsin(cx))^n \left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n} \Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{2\sqrt{d-c^2dx^2}}$$
$$+ d^3 \int \frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx$$
$$+ \frac{\left(d^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int x^n \sin\left(\frac{5a}{b}-\frac{5x}{b}\right)\,dx, x, a+b\arcsin(cx)\right)}{16b\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(5d^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int x^n \sin\left(\frac{3a}{b}-\frac{3x}{b}\right)\,dx, x, a+b\arcsin(cx)\right)}{16b\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(5d^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int x^n \sin\left(\frac{a}{b}-\frac{x}{b}\right)\,dx, x, a+b\arcsin(cx)\right)}{8b\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(3d^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int x^n \sin\left(\frac{3a}{b}-\frac{3x}{b}\right)\,dx, x, a+b\arcsin(cx)\right)}{4b\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(9d^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int x^n \sin\left(\frac{a}{b}-\frac{x}{b}\right)\,dx, x, a+b\arcsin(cx)\right)}{4b\sqrt{d-c^2dx^2}}$$

$$= \frac{3d^3 e^{-\frac{ia}{b}} \sqrt{1-c^2x^2}(a+b\arcsin(cx))^n \left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n} \Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)}{2\sqrt{d-c^2dx^2}}$$
$$+ \frac{3d^3 e^{\frac{ia}{b}} \sqrt{1-c^2x^2}(a+b\arcsin(cx))^n \left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n} \Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{2\sqrt{d-c^2dx^2}}$$
$$+ d^3 \int \frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx$$
$$+ \frac{\left(id^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int e^{-i\left(\frac{5a}{b}-\frac{5x}{b}\right)} x^n\,dx, x, a+b\arcsin(cx)\right)}{32b\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(id^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int e^{i\left(\frac{5a}{b}-\frac{5x}{b}\right)} x^n\,dx, x, a+b\arcsin(cx)\right)}{32b\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(5id^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int e^{-i\left(\frac{3a}{b}-\frac{3x}{b}\right)} x^n\,dx, x, a+b\arcsin(cx)\right)}{32b\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(5id^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int e^{i\left(\frac{3a}{b}-\frac{3x}{b}\right)} x^n\,dx, x, a+b\arcsin(cx)\right)}{32b\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(5id^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int e^{-i\left(\frac{a}{b}-\frac{x}{b}\right)} x^n\,dx, x, a+b\arcsin(cx)\right)}{16b\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(5id^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int e^{i\left(\frac{a}{b}-\frac{x}{b}\right)} x^n\,dx, x, a+b\arcsin(cx)\right)}{16b\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(3id^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int e^{-i\left(\frac{3a}{b}-\frac{3x}{b}\right)} x^n\,dx, x, a+b\arcsin(cx)\right)}{8b\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(3id^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int e^{i\left(\frac{3a}{b}-\frac{3x}{b}\right)} x^n\,dx, x, a+b\arcsin(cx)\right)}{8b\sqrt{d-c^2dx^2}}$$
$$- \frac{\left(9id^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int e^{-i\left(\frac{a}{b}-\frac{x}{b}\right)} x^n\,dx, x, a+b\arcsin(cx)\right)}{8b\sqrt{d-c^2dx^2}}$$
$$+ \frac{\left(9id^3\sqrt{1-c^2x^2}\right) \text{Subst}\left(\int e^{i\left(\frac{a}{b}-\frac{x}{b}\right)} x^n\,dx, x, a+b\arcsin(cx)\right)}{8b\sqrt{d-c^2dx^2}}$$

$$
= \frac{11d^3e^{-\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(cx))}{b}\right)}{16\sqrt{d-c^2dx^2}}
+ \frac{11d^3e^{\frac{ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(cx))}{b}\right)}{16\sqrt{d-c^2dx^2}}
- \frac{5\ 3^{-1-n}d^3e^{-\frac{3ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(cx))}{b}\right)}{32\sqrt{d-c^2dx^2}}
+ \frac{3^{-n}d^3e^{-\frac{3ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(cx))}{b}\right)}{8\sqrt{d-c^2dx^2}}
- \frac{5\ 3^{-1-n}d^3e^{\frac{3ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(cx))}{b}\right)}{32\sqrt{d-c^2dx^2}}
+ \frac{3^{-n}d^3e^{\frac{3ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(cx))}{b}\right)}{8\sqrt{d-c^2dx^2}}
+ \frac{5^{-1-n}d^3e^{-\frac{5ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{5i(a+b\arcsin(cx))}{b}\right)}{32\sqrt{d-c^2dx^2}}
+ \frac{5^{-1-n}d^3e^{\frac{5ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{5i(a+b\arcsin(cx))}{b}\right)}{32\sqrt{d-c^2dx^2}}
+ d^3\int\frac{(a+b\arcsin(cx))^n}{x\sqrt{d-c^2dx^2}}\,dx
$$

Mathematica [N/A]

Not integrable

Time = 0.31 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$
\int\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x}\,dx=\int\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x}\,dx
$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x,x]
[Out] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.18 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int \frac{\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}} \left(a +b \arcsin \left(c x \right)\right)^{n}}{x}d x$$

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x)
```

```
[Out] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.86

$$\int \frac{\left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^n}{x}\,dx=\int \frac{{\left(-c^{2} d x^{2} + d\right)}^{\frac{5}{2}} {\left(b \arcsin\left(c x\right) + a\right)}^{n}}{x}\,{d x}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="fricas")
```

```
[Out] integral((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(-c^2*d*x^2 + d)*(b*arcsin
(c*x) + a)^n/x, x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{\left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^n}{x}\,dx=\text{Timed out}$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n/x,x)
```

```
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 0.91 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{\left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^n}{x}\,dx=\int \frac{{\left(-c^{2} d x^{2} + d\right)}^{\frac{5}{2}} {\left(b \arcsin\left(c x\right) + a\right)}^{n}}{x}\,{d x}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="maxima")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n/x, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x}\,dx = \text{Exception raised: TypeError}$$

[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x,x, algorithm="giac")

[Out] Exception raised: TypeError >> an error occurred running a Giac command:INPUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

Mupad [N/A]

Not integrable

Time = 0.14 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^n\,(d-c^2\,d\,x^2)^{5/2}}{x}\,dx$$

[In] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2))/x,x)

[Out] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2))/x, x)

3.496 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x^2}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 29

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x^2}\,dx = -\frac{15cd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^{1+n}}{8b(1+n)\sqrt{d-c^2dx^2}}$$
$$+\frac{i2^{-2-n}cd^3e^{-\frac{2ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}}$$
$$-\frac{i2^{-2-n}cd^3e^{\frac{2ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}}$$
$$+\frac{i2^{-2(3+n)}cd^3e^{-\frac{4ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}}$$
$$-\frac{i2^{-2(3+n)}cd^3e^{\frac{4ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{4i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}}$$
$$+d^3\text{Int}\left(\frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}},x\right)$$

```
[Out] -15/8*c*d^3*(a+b*arcsin(c*x))^(1+n)*(-c^2*x^2+1)^(1/2)/b/(1+n)/(-c^2*d*x^2+
d)^(1/2)+I*2^(-2-n)*c*d^3*(a+b*arcsin(c*x))^n*GAMMA(1+n,-2*I*(a+b*arcsin(c*
x))/b)*(-c^2*x^2+1)^(1/2)/exp(2*I*a/b)/((-I*(a+b*arcsin(c*x))/b)^n)/(-c^2*d
*x^2+d)^(1/2)-I*2^(-2-n)*c*d^3*exp(2*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n,2
*I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1/2)/((I*(a+b*arcsin(c*x))/b)^n)/(-c^
2*d*x^2+d)^(1/2)+I*c*d^3*(a+b*arcsin(c*x))^n*GAMMA(1+n,-4*I*(a+b*arcsin(c*x
))/b)*(-c^2*x^2+1)^(1/2)/(2^(6+2*n))/exp(4*I*a/b)/((-I*(a+b*arcsin(c*x))/b)
^n)/(-c^2*d*x^2+d)^(1/2)-I*c*d^3*exp(4*I*a/b)*(a+b*arcsin(c*x))^n*GAMMA(1+n
,4*I*(a+b*arcsin(c*x))/b)*(-c^2*x^2+1)^(1/2)/(2^(6+2*n))/((I*(a+b*arcsin(c*
```

```
x))/b)^n)/(-c^2*d*x^2+d)^(1/2)+d^3*Unintegrable((a+b*arcsin(c*x))^n/x^2/(-c
^2*d*x^2+d)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.81 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x^2}\,dx=\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x^2}\,dx$$

```
[In] Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x^2,x]
```

```
[Out] (-15*c*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^(1 + n))/(8*b*(1 + n)*Sqrt
[d - c^2*d*x^2]) + (I*2^(-2 - n)*c*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
)^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c*x]))/b])/(E^(((2*I)*a)/b)*Sqrt[d -
 c^2*d*x^2]*(((-I)*(a + b*ArcSin[c*x]))/b)^n) - (I*2^(-2 - n)*c*d^3*E^(((2*
I)*a)/b)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((2*I)*(a + b
*ArcSin[c*x]))/b])/(Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + (I
*c*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^n*Gamma[1 + n, ((-4*I)*(a + b*
ArcSin[c*x]))/b])/(2^(2*(3 + n))*E^(((4*I)*a)/b)*Sqrt[d - c^2*d*x^2]*(((-I)
*(a + b*ArcSin[c*x]))/b)^n) - (I*c*d^3*E^(((4*I)*a)/b)*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x])^n*Gamma[1 + n, ((4*I)*(a + b*ArcSin[c*x]))/b])/(2^(2*(3 +
 n))*Sqrt[d - c^2*d*x^2]*((I*(a + b*ArcSin[c*x]))/b)^n) + d^3*Defer[Int][(a
 + b*ArcSin[c*x])^n/(x^2*Sqrt[d - c^2*d*x^2]), x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(-\frac{3c^2d^3(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}+\frac{d^3(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}+\frac{3c^4d^3x^2(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}-\frac{c^6d^3x^4(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\right)dx\\
&= d^3\int \frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\,dx-\left(3c^2d^3\right)\int \frac{(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\,dx\\
&\quad+\left(3c^4d^3\right)\int \frac{x^2(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\,dx-\left(c^6d^3\right)\int \frac{x^4(a+b\arcsin(cx))^n}{\sqrt{d-c^2dx^2}}\,dx\\
&= -\frac{3cd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^{1+n}}{b(1+n)\sqrt{d-c^2dx^2}}+d^3\int \frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\,dx\\
&\quad-\frac{\left(cd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int x^n\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(3cd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int x^n\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{3cd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^{1+n}}{b(1+n)\sqrt{d-c^2dx^2}}+d^3\int\frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\,dx\\
&\quad-\frac{\left(cd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\left(\frac{3x^n}{8}+\frac{1}{8}x^n\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)-\frac{1}{2}x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\right)\,dx,x,a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(3cd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\left(\frac{x^n}{2}-\frac{1}{2}x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\right)\,dx,x,a+b\arcsin(cx)\right)}{b\sqrt{d-c^2dx^2}}\\
&= -\frac{15cd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^{1+n}}{8b(1+n)\sqrt{d-c^2dx^2}}+d^3\int\frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\,dx\\
&\quad-\frac{\left(cd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int x^n\cos\left(\frac{4a}{b}-\frac{4x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{8b\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(cd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{2b\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(3cd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int x^n\cos\left(\frac{2a}{b}-\frac{2x}{b}\right)\,dx,x,a+b\arcsin(cx)\right)}{2b\sqrt{d-c^2dx^2}}\\
&= -\frac{15cd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^{1+n}}{8b(1+n)\sqrt{d-c^2dx^2}}+d^3\int\frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\,dx\\
&\quad-\frac{\left(cd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{4a}{b}-\frac{4x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{16b\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(cd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int e^{i\left(\frac{4a}{b}-\frac{4x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{16b\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(cd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{4b\sqrt{d-c^2dx^2}}\\
&\quad+\frac{\left(cd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int e^{i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{4b\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(3cd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int e^{-i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{4b\sqrt{d-c^2dx^2}}\\
&\quad-\frac{\left(3cd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int e^{i\left(\frac{2a}{b}-\frac{2x}{b}\right)}x^n\,dx,x,a+b\arcsin(cx)\right)}{4b\sqrt{d-c^2dx^2}}
\end{aligned}
$$

$$= -\frac{15cd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^{1+n}}{8b(1+n)\sqrt{d-c^2dx^2}}$$
$$+\frac{i2^{-2-n}cd^3e^{-\frac{2ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}}$$
$$-\frac{i2^{-2-n}cd^3e^{\frac{2ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}}$$
$$+\frac{i4^{-3-n}cd^3e^{-\frac{4ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(-\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{4i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}}$$
$$-\frac{i4^{-3-n}cd^3e^{\frac{4ia}{b}}\sqrt{1-c^2x^2}(a+b\arcsin(cx))^n\left(\frac{i(a+b\arcsin(cx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{4i(a+b\arcsin(cx))}{b}\right)}{\sqrt{d-c^2dx^2}}$$
$$+d^3\int\frac{(a+b\arcsin(cx))^n}{x^2\sqrt{d-c^2dx^2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.68 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.07

$$\int\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x^2}\,dx=\int\frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x^2}\,dx$$

```
[In] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x^2,x]
[Out] Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^n)/x^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.20 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.93

$$\int\frac{(-c^2d\,x^2+d)^{\frac{5}{2}}(a+b\arcsin(cx))^n}{x^2}dx$$

```
[In] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x)
[Out] int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.86

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x^2}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin{(cx)}+a)^n}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="fricas
")
```

```
[Out] integral((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(-c^2*d*x^2 + d)*(b*arcsin
(c*x) + a)^n/x^2, x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x^2}\,dx=\text{Timed out}$$

```
[In] integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**n/x**2,x)
```

```
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 0.90 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x^2}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin{(cx)}+a)^n}{x^2}\,dx$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="maxima
")
```

```
[Out] integrate((-c^2*d*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^n/x^2, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^n/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.14 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.00

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^n}{x^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^n\,(d-c^2\,d\,x^2)^{5/2}}{x^2}\,dx$$

```
[In] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2))/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))^n*(d - c^2*d*x^2)^(5/2))/x^2, x)
```

3.497 $\int \frac{x^m \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{x^m \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \text{Int}\left(\frac{x^m \arcsin(ax)^n}{\sqrt{1-a^2x^2}},x\right)$$

```
[Out] Unintegrable(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.07 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx$$

```
[In] Int[(x^m*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
[Out] Defer[Int][(x^m*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2], x]
```

Rubi steps

$$\text{integral} = \int \frac{x^m \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.55 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{x^m \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx$$

```
[In] Integrate[(x^m*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
[Out] Integrate[(x^m*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2], x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.24 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{x^m \arcsin\left(ax\right)^n}{\sqrt{-a^2x^2+1}}dx$$

```
[In] int(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
[Out] int(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.50

$$\int \frac{x^m \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \arcsin\left(ax\right)^n}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^m*arcsin(a*x)^n/(a^2*x^2 - 1), x)
```

Sympy [N/A]

Not integrable

Time = 4.02 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{x^m \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m \operatorname{asin}^n\left(ax\right)}{\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

```
[In] integrate(x**m*asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x**m*asin(a*x)**n/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{x^m \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F(-1)]

Timed out.

$$\int \frac{x^m \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \text{Timed out}$$

```
[In] integrate(x^m*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{x^m \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^m\,\mathrm{asin}(a\,x)^n}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^m*asin(a*x)^n)/(1 - a^2*x^2)^(1/2),x)
```

```
[Out] int((x^m*asin(a*x)^n)/(1 - a^2*x^2)^(1/2), x)
```

3.498 $\int \frac{x^3 \arcsin(ax)^n}{\sqrt{1-a^2x^2}} dx$

Optimal result

Integrand size = 24, antiderivative size = 163

$$\int \frac{x^3 \arcsin(ax)^n}{\sqrt{1-a^2x^2}} dx = -\frac{3(-i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n,-i\arcsin(ax))}{8a^4} - \frac{3(i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n,i\arcsin(ax))}{8a^4} + \frac{3^{-1-n}(-i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n,-3i\arcsin(ax))}{8a^4} + \frac{3^{-1-n}(i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n,3i\arcsin(ax))}{8a^4}$$

```
[Out] -3/8*arcsin(a*x)^n*GAMMA(1+n,-I*arcsin(a*x))/a^4/((-I*arcsin(a*x))^n)-3/8*a
rcsin(a*x)^n*GAMMA(1+n,I*arcsin(a*x))/a^4/((I*arcsin(a*x))^n)+1/8*3^(-1-n)*
arcsin(a*x)^n*GAMMA(1+n,-3*I*arcsin(a*x))/a^4/((-I*arcsin(a*x))^n)+1/8*3^(-
1-n)*arcsin(a*x)^n*GAMMA(1+n,3*I*arcsin(a*x))/a^4/((I*arcsin(a*x))^n)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4809, 3393, 3389, 2212}

$$\int \frac{x^3 \arcsin(ax)^n}{\sqrt{1-a^2x^2}} dx = -\frac{3\arcsin(ax)^n(-i\arcsin(ax))^{-n}\Gamma(n+1,-i\arcsin(ax))}{8a^4} + \frac{3^{-n-1}\arcsin(ax)^n(-i\arcsin(ax))^{-n}\Gamma(n+1,-3i\arcsin(ax))}{8a^4} - \frac{3(i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(n+1,i\arcsin(ax))}{8a^4} + \frac{3^{-n-1}(i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(n+1,3i\arcsin(ax))}{8a^4}$$

```
[In] Int[(x^3*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (-3*ArcSin[a*x]^n*Gamma[1 + n, (-I)*ArcSin[a*x]])/(8*a^4*((-I)*ArcSin[a*x])
^n) - (3*ArcSin[a*x]^n*Gamma[1 + n, I*ArcSin[a*x]])/(8*a^4*(I*ArcSin[a*x])^
n) + (3^(-1 - n)*ArcSin[a*x]^n*Gamma[1 + n, (-3*I)*ArcSin[a*x]])/(8*a^4*((-
I)*ArcSin[a*x])^n) + (3^(-1 - n)*ArcSin[a*x]^n*Gamma[1 + n, (3*I)*ArcSin[a*
x]])/(8*a^4*(I*ArcSin[a*x])^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3389

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int x^n \sin^3(x)\,dx, x, \arcsin(ax)\right)}{a^4}\\
&= \frac{\text{Subst}\left(\int \left(\frac{3}{4}x^n \sin(x) - \frac{1}{4}x^n \sin(3x)\right)\,dx, x, \arcsin(ax)\right)}{a^4}\\
&= -\frac{\text{Subst}\left(\int x^n \sin(3x)\,dx, x, \arcsin(ax)\right)}{4a^4} + \frac{3\text{Subst}\left(\int x^n \sin(x)\,dx, x, \arcsin(ax)\right)}{4a^4}
\end{aligned}$$

$$= -\frac{i\text{Subst}\left(\int e^{-3ix}x^n\,dx,x,\arcsin(ax)\right)}{8a^4}+\frac{i\text{Subst}\left(\int e^{3ix}x^n\,dx,x,\arcsin(ax)\right)}{8a^4}+\frac{(3i)\text{Subst}\left(\int e^{-ix}x^n\,dx,x,\arcsin(ax)\right)}{8a^4}-\frac{(3i)\text{Subst}\left(\int e^{ix}x^n\,dx,x,\arcsin(ax)\right)}{8a^4}$$

$$= -\frac{3(-i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n,-i\arcsin(ax))}{8a^4}-\frac{3(i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n,i\arcsin(ax))}{8a^4}+\frac{3^{-1-n}(-i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n,-3i\arcsin(ax))}{8a^4}+\frac{3^{-1-n}(i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n,3i\arcsin(ax))}{8a^4}$$

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 153, normalized size of antiderivative = 0.94

$$\int \frac{x^3\arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = -\frac{3^{-1-n}\arcsin(ax)^n\left(\arcsin(ax)^2\right)^{-2n}\left(3^{2+n}(i\arcsin(ax))^n\left(\arcsin(ax)^2\right)^n\Gamma(1+n,-i\arcsin(ax))+(-i\,\text{ar}\right.}{}$$

```
[In] Integrate[(x^3*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] -1/8*(3^(-1 - n)*ArcSin[a*x]^n*(3^(2 + n)*(I*ArcSin[a*x])^n*(ArcSin[a*x]^2)
^n*Gamma[1 + n, (-I)*ArcSin[a*x]] + ((-I)*ArcSin[a*x])^n*(3^(2 + n)*(ArcSin
[a*x]^2)^n*Gamma[1 + n, I*ArcSin[a*x]] - (I*ArcSin[a*x])^(2*n)*Gamma[1 + n,
 (-3*I)*ArcSin[a*x]] - (ArcSin[a*x]^2)^n*Gamma[1 + n, (3*I)*ArcSin[a*x]])))
/(a^4*(ArcSin[a*x]^2)^(2*n))
```

Maple [F]

$$\int \frac{x^3\arcsin(ax)^n}{\sqrt{-a^2x^2+1}}dx$$

```
[In] int(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

Fricas [F]

$$\int \frac{x^3 \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\, dx = \int \frac{x^3 \arcsin\left(ax\right)^n}{\sqrt{-a^2x^2+1}}\, dx$$

```
[In] integrate(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^3*arcsin(a*x)^n/(a^2*x^2 - 1), x)
```

Sympy [F]

$$\int \frac{x^3 \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\, dx = \int \frac{x^3 \operatorname{asin}^n\left(ax\right)}{\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\, dx$$

```
[In] integrate(x**3*asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x**3*asin(a*x)**n/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{x^3 \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\, dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^3 \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\, dx = \text{Exception raised: TypeError}$$

```
[In] integrate(x^3*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> an error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const in
dex_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3 \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^3\,\mathrm{asin}(a\,x)^n}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^3*asin(a*x)^n)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^3*asin(a*x)^n)/(1 - a^2*x^2)^(1/2), x)
```

3.499 $\int \frac{x^2 \arcsin(ax)^n}{\sqrt{1-a^2x^2}} dx$

Optimal result

Integrand size = 24, antiderivative size = 109

$$\int \frac{x^2 \arcsin(ax)^n}{\sqrt{1-a^2x^2}} dx = \frac{\arcsin(ax)^{1+n}}{2a^3(1+n)} + \frac{i2^{-3-n}(-i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n,-2i\arcsin(ax))}{a^3} - \frac{i2^{-3-n}(i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n,2i\arcsin(ax))}{a^3}$$

```
[Out] 1/2*arcsin(a*x)^(1+n)/a^3/(1+n)+I*2^(-3-n)*arcsin(a*x)^n*GAMMA(1+n,-2*I*arc
sin(a*x))/a^3/((-I*arcsin(a*x))^n)-I*2^(-3-n)*arcsin(a*x)^n*GAMMA(1+n,2*I*a
rcsin(a*x))/a^3/((I*arcsin(a*x))^n)
```

Rubi [A] (verified)

Time = 0.13 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4809, 3393, 3388, 2212}

$$\int \frac{x^2 \arcsin(ax)^n}{\sqrt{1-a^2x^2}} dx = \frac{\arcsin(ax)^{n+1}}{2a^3(n+1)} + \frac{i2^{-n-3}\arcsin(ax)^n(-i\arcsin(ax))^{-n}\Gamma(n+1,-2i\arcsin(ax))}{a^3} - \frac{i2^{-n-3}(i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(n+1,2i\arcsin(ax))}{a^3}$$

```
[In] Int[(x^2*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^(1 + n)/(2*a^3*(1 + n)) + (I*2^(-3 - n)*ArcSin[a*x]^n*Gamma[1 +
 n, (-2*I)*ArcSin[a*x]])/(a^3*((-I)*ArcSin[a*x])^n) - (I*2^(-3 - n)*ArcSin[
a*x]^n*Gamma[1 + n, (2*I)*ArcSin[a*x]])/(a^3*(I*ArcSin[a*x])^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3388

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Dist[I/2, Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Dist[
I/2, Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e,
f, m}, x] && IntegerQ[2*k]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int x^n \sin^2(x)\,dx, x, \arcsin(ax)\right)}{a^3} \\
&= \frac{\text{Subst}\left(\int \left(\frac{x^n}{2} - \frac{1}{2}x^n\cos(2x)\right)\,dx, x, \arcsin(ax)\right)}{a^3} \\
&= \frac{\arcsin(ax)^{1+n}}{2a^3(1+n)} - \frac{\text{Subst}\left(\int x^n\cos(2x)\,dx, x, \arcsin(ax)\right)}{2a^3} \\
&= \frac{\arcsin(ax)^{1+n}}{2a^3(1+n)} - \frac{\text{Subst}\left(\int e^{-2ix}x^n\,dx, x, \arcsin(ax)\right)}{4a^3} - \frac{\text{Subst}\left(\int e^{2ix}x^n\,dx, x, \arcsin(ax)\right)}{4a^3}
\end{aligned}$$

$$= \frac{\arcsin(ax)^{1+n}}{2a^3(1+n)} + \frac{i2^{-3-n}(-i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n,-2i\arcsin(ax))}{a^3} - \frac{i2^{-3-n}(i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n,2i\arcsin(ax))}{a^3}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.00

$$\int \frac{x^2\arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \frac{2^{-3-n}\arcsin(ax)^n\left(\arcsin(ax)^2\right)^{-n}\left(2^{2+n}\arcsin(ax)\left(\arcsin(ax)^2\right)^n + i(1+n)(i\arcsin(ax))^n\Gamma(1+n,-2i\arcsin(ax)\right.}{a^3(1+n)}$$

```
[In] Integrate[(x^2*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] (2^(-3 - n)*ArcSin[a*x]^n*(2^(2 + n)*ArcSin[a*x]*(ArcSin[a*x]^2)^n + I*(1 +
 n)*(I*ArcSin[a*x])^n*Gamma[1 + n, (-2*I)*ArcSin[a*x]] - I*(1 + n)*((-I)*Ar
cSin[a*x])^n*Gamma[1 + n, (2*I)*ArcSin[a*x]]))/(a^3*(1 + n)*(ArcSin[a*x]^2)
^n)
```

Maple [F]

$$\int \frac{x^2\arcsin(ax)^n}{\sqrt{-a^2x^2+1}}dx$$

```
[In] int(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

```
[Out] int(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)
```

Fricas [F]

$$\int \frac{x^2\arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^2\arcsin(ax)^n}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(-sqrt(-a^2*x^2 + 1)*x^2*arcsin(a*x)^n/(a^2*x^2 - 1), x)
```

Sympy [F]

$$\int \frac{x^2 \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^2 \operatorname{asin}^n{(ax)}}{\sqrt{-(ax-1)(ax+1)}}\,dx$$

```
[In] integrate(x**2*asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(x**2*asin(a*x)**n/sqrt(-(a*x - 1)*(a*x + 1)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{x^2 \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [F]

$$\int \frac{x^2 \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^2 \arcsin{(ax)}^n}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x^2*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(x^2*arcsin(a*x)^n/sqrt(-a^2*x^2 + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2 \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x^2 \operatorname{asin}(a\,x)^n}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x^2*asin(a*x)^n)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x^2*asin(a*x)^n)/(1 - a^2*x^2)^(1/2), x)
```

3.500 $\int \frac{x \arcsin(ax)^n}{\sqrt{1-a^2x^2}} dx$

Optimal result

Integrand size = 22, antiderivative size = 75

$$\int \frac{x \arcsin(ax)^n}{\sqrt{1-a^2x^2}} dx = -\frac{(-i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n,-i\arcsin(ax))}{2a^2} - \frac{(i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n,i\arcsin(ax))}{2a^2}$$

```
[Out] -1/2*arcsin(a*x)^n*GAMMA(1+n,-I*arcsin(a*x))/a^2/((-I*arcsin(a*x))^n)-1/2*a
rcsin(a*x)^n*GAMMA(1+n,I*arcsin(a*x))/a^2/((I*arcsin(a*x))^n)
```

Rubi [A] (verified)

Time = 0.07 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4809, 3389, 2212}

$$\int \frac{x \arcsin(ax)^n}{\sqrt{1-a^2x^2}} dx = -\frac{\arcsin(ax)^n(-i\arcsin(ax))^{-n}\Gamma(n+1,-i\arcsin(ax))}{2a^2} - \frac{(i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(n+1,i\arcsin(ax))}{2a^2}$$

```
[In] Int[(x*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] -1/2*(ArcSin[a*x]^n*Gamma[1 + n, (-I)*ArcSin[a*x]])/(a^2*((-I)*ArcSin[a*x])
^n) - (ArcSin[a*x]^n*Gamma[1 + n, I*ArcSin[a*x]])/(2*a^2*(I*ArcSin[a*x])^n)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
```

```
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 3389

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Dist[I
/2, Int[(c + d*x)^m/E^(I*(e + f*x)), x], x] - Dist[I/2, Int[(c + d*x)^m*E^(
I*(e + f*x)), x], x] /; FreeQ[{c, d, e, f, m}, x]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int x^n \sin(x)\,dx, x, \arcsin(ax)\right)}{a^2} \\
&= \frac{i\text{Subst}\left(\int e^{-ix}x^n\,dx, x, \arcsin(ax)\right)}{2a^2} - \frac{i\text{Subst}\left(\int e^{ix}x^n\,dx, x, \arcsin(ax)\right)}{2a^2} \\
&= -\frac{(-i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n, -i\arcsin(ax))}{2a^2} \\
&\quad - \frac{(i\arcsin(ax))^{-n}\arcsin(ax)^n\Gamma(1+n, i\arcsin(ax))}{2a^2}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 70, normalized size of antiderivative = 0.93

$$
\int \frac{x\arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = -\frac{\arcsin(ax)^n\left(\arcsin(ax)^2\right)^{-n}\left((i\arcsin(ax))^n\Gamma(1+n, -i\arcsin(ax)) + (-i\arcsin(ax))^n\Gamma(1+n, i\arcsin}{2a^2}
$$

```
[In] Integrate[(x*ArcSin[a*x]^n)/Sqrt[1 - a^2*x^2],x]
```

```
[Out] -1/2*(ArcSin[a*x]^n*((I*ArcSin[a*x])^n*Gamma[1 + n, (-I)*ArcSin[a*x]] + ((-
I)*ArcSin[a*x])^n*Gamma[1 + n, I*ArcSin[a*x]]))/(a^2*(ArcSin[a*x]^2)^n)
```

Maple [F]

$$\int \frac{x \arcsin(ax)^n}{\sqrt{-a^2x^2+1}}dx$$

[In] int(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)

[Out] int(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x)

Fricas [F]

$$\int \frac{x \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x \arcsin(ax)^n}{\sqrt{-a^2x^2+1}}\,dx$$

[In] integrate(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(-a^2*x^2 + 1)*x*arcsin(a*x)^n/(a^2*x^2 - 1), x)

Sympy [F]

$$\int \frac{x \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x \operatorname{asin}^n(ax)}{\sqrt{-(ax-1)(ax+1)}}\,dx$$

[In] integrate(x*asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)

[Out] Integral(x*asin(a*x)**n/sqrt(-(a*x - 1)*(a*x + 1)), x)

Maxima [F(-2)]

Exception generated.

$$\int \frac{x \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \text{Exception raised: RuntimeError}$$

[In] integrate(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")

[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ e exponent.

Giac [F]

$$\int \frac{x \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x \arcsin{(ax)}^n}{\sqrt{-a^2x^2+1}}\,dx$$

```
[In] integrate(x*arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(x*arcsin(a*x)^n/sqrt(-a^2*x^2 + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x \arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \int \frac{x\,\mathrm{asin}(a\,x)^n}{\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int((x*asin(a*x)^n)/(1 - a^2*x^2)^(1/2),x)
[Out] int((x*asin(a*x)^n)/(1 - a^2*x^2)^(1/2), x)
```

3.501 $\int \frac{\arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 17

$$\int \frac{\arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx=\frac{\arcsin(ax)^{1+n}}{a(1+n)}$$

```
[Out] arcsin(a*x)^(1+n)/a/(1+n)
```

Rubi [A] (verified)

Time = 0.02 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4737}

$$\int \frac{\arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx=\frac{\arcsin(ax)^{n+1}}{a(n+1)}$$

```
[In] Int[ArcSin[a*x]^n/Sqrt[1 - a^2*x^2],x]
```

```
[Out] ArcSin[a*x]^(1 + n)/(a*(1 + n))
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rubi steps

$$\text{integral}=\frac{\arcsin(ax)^{1+n}}{a(1+n)}$$

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx=\frac{\arcsin(ax)^{1+n}}{a(1+n)}$$

```
[In] Integrate[ArcSin[a*x]^n/Sqrt[1 - a^2*x^2],x]
[Out] ArcSin[a*x]^(1 + n)/(a*(1 + n))
```

Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.06

method	result	size
derivativedivides	$\frac{\arcsin(ax)^{1+n}}{a(1+n)}$	18
default	$\frac{\arcsin(ax)^{1+n}}{a(1+n)}$	18

```
[In] int(arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
[Out] arcsin(a*x)^(1+n)/a/(1+n)
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.06

$$\int \frac{\arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx=\frac{\arcsin{(ax)}^n\arcsin{(ax)}}{an+a}$$

```
[In] integrate(arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] arcsin(a*x)^n*arcsin(a*x)/(a*n + a)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 34 vs. $2(12) = 24$.

Time = 0.34 (sec) , antiderivative size = 34, normalized size of antiderivative = 2.00

$$\int \frac{\arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \tilde{\infty}x & \text{for } a = 0 \wedge n = -1 \\ 0^n x & \text{for } a = 0 \\ \frac{\log(\operatorname{asin}(ax))}{a} & \text{for } n = -1 \\ \frac{\operatorname{asin}(ax)\operatorname{asin}^n(ax)}{an+a} & \text{otherwise} \end{cases}$$

```
[In] integrate(asin(a*x)**n/(-a**2*x**2+1)**(1/2),x)
```

```
[Out] Piecewise((zoo*x, Eq(a, 0) & Eq(n, -1)), (0**n*x, Eq(a, 0)), (log(asin(a*x)
)/a, Eq(n, -1)), (asin(a*x)*asin(a*x)**n/(a*n + a), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^{n+1}}{a(n+1)}$$

```
[In] integrate(arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

```
[Out] arcsin(a*x)^(n + 1)/(a*(n + 1))
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \frac{\arcsin(ax)^{n+1}}{a(n+1)}$$

```
[In] integrate(arcsin(a*x)^n/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] arcsin(a*x)^(n + 1)/(a*(n + 1))
```

Mupad [B] (verification not implemented)

Time = 0.34 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.94

$$\int \frac{\arcsin(ax)^n}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{\ln(\mathrm{asin}(a\,x))}{a} & \text{if } n=-1 \\ \frac{\mathrm{asin}(a\,x)^{n+1}}{a\,(n+1)} & \text{if } n\neq -1 \end{cases}$$

```
[In] int(asin(a*x)^n/(1 - a^2*x^2)^(1/2),x)
[Out] piecewise(n == -1, log(asin(a*x))/a, n ~= -1, asin(a*x)^(n + 1)/(a*(n + 1))
)
```

3.502 $\int \frac{\arcsin(ax)^n}{x\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{\arcsin(ax)^n}{x\sqrt{1-a^2x^2}}\,dx = \text{Int}\left(\frac{\arcsin(ax)^n}{x\sqrt{1-a^2x^2}},x\right)$$

```
[Out] Unintegrable(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\arcsin(ax)^n}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin(ax)^n}{x\sqrt{1-a^2x^2}}\,dx$$

```
[In] Int[ArcSin[a*x]^n/(x*Sqrt[1 - a^2*x^2]),x]
[Out] Defer[Int][ArcSin[a*x]^n/(x*Sqrt[1 - a^2*x^2]), x]
```

Rubi steps

$$\text{integral} = \int \frac{\arcsin(ax)^n}{x\sqrt{1-a^2x^2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 2.81 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{\arcsin(ax)^n}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin(ax)^n}{x\sqrt{1-a^2x^2}}\,dx$$

```
[In] Integrate[ArcSin[a*x]^n/(x*Sqrt[1 - a^2*x^2]),x]
[Out] Integrate[ArcSin[a*x]^n/(x*Sqrt[1 - a^2*x^2]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.11 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\arcsin(ax)^n}{x\sqrt{-a^2x^2+1}}dx$$

```
[In] int(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x)
[Out] int(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.46

$$\int \frac{\arcsin(ax)^n}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin(ax)^n}{\sqrt{-a^2x^2+1}x}\,dx$$

```
[In] integrate(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^n/(a^2*x^3 - x), x)
```

Sympy [N/A]

Not integrable

Time = 0.72 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)^n}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\operatorname{asin}^n(ax)}{x\sqrt{-(ax-1)(ax+1)}}\,dx$$

```
[In] integrate(asin(a*x)**n/x/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(asin(a*x)**n/(x*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(ax)^n}{x\sqrt{1-a^2x^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.35 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)^n}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin(ax)^n}{\sqrt{-a^2x^2+1}x}\,dx$$

```
[In] integrate(arcsin(a*x)^n/x/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^n/(sqrt(-a^2*x^2 + 1)*x), x)
```

Mupad [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)^n}{x\sqrt{1-a^2x^2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^n}{x\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(asin(a*x)^n/(x*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^n/(x*(1 - a^2*x^2)^(1/2)), x)
```

3.503 $\int \frac{\arcsin(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 24

$$\int \frac{\arcsin(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx = \text{Int}\left(\frac{\arcsin(ax)^n}{x^2\sqrt{1-a^2x^2}},x\right)$$

```
[Out] Unintegrable(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.06 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\arcsin(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx$$

```
[In] Int[ArcSin[a*x]^n/(x^2*Sqrt[1 - a^2*x^2]),x]
[Out] Defer[Int][ArcSin[a*x]^n/(x^2*Sqrt[1 - a^2*x^2]), x]
```

Rubi steps

$$\text{integral} = \int \frac{\arcsin(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.86 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{\arcsin(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx$$

```
[In] Integrate[ArcSin[a*x]^n/(x^2*Sqrt[1 - a^2*x^2]),x]
[Out] Integrate[ArcSin[a*x]^n/(x^2*Sqrt[1 - a^2*x^2]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.12 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.92

$$\int \frac{\arcsin\left(ax\right)^{n}}{x^{2}\sqrt{-a^{2}x^{2}+1}}dx$$

```
[In] int(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x)
[Out] int(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.54

$$\int \frac{\arcsin(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin\left(ax\right)^{n}}{\sqrt{-a^{2}x^{2}+1}x^{2}}\,dx$$

```
[In] integrate(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
[Out] integral(-sqrt(-a^2*x^2 + 1)*arcsin(a*x)^n/(a^2*x^4 - x^2), x)
```

Sympy [N/A]

Not integrable

Time = 1.08 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.08

$$\int \frac{\arcsin(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\operatorname{asin}^{n}\left(ax\right)}{x^{2}\sqrt{-\left(ax-1\right)\left(ax+1\right)}}\,dx$$

```
[In] integrate(asin(a*x)**n/x**2/(-a**2*x**2+1)**(1/2),x)
[Out] Integral(asin(a*x)**n/(x**2*sqrt(-(a*x - 1)*(a*x + 1))), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negativ
e exponent.
```

Giac [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\arcsin(ax)^n}{\sqrt{-a^2x^2+1}x^2}\,dx$$

```
[In] integrate(arcsin(a*x)^n/x^2/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
[Out] integrate(arcsin(a*x)^n/(sqrt(-a^2*x^2 + 1)*x^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(ax)^n}{x^2\sqrt{1-a^2x^2}}\,dx = \int \frac{\mathrm{asin}(a\,x)^n}{x^2\,\sqrt{1-a^2\,x^2}}\,dx$$

```
[In] int(asin(a*x)^n/(x^2*(1 - a^2*x^2)^(1/2)),x)
[Out] int(asin(a*x)^n/(x^2*(1 - a^2*x^2)^(1/2)), x)
```

3.504 $\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 376

$$\begin{aligned}\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx &= \frac{2bd^2x\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}\\ &-\frac{3bcd^2x^2\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}-\frac{2bc^2d^2x^3\sqrt{d+cdx}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}\\ &-\frac{bc^3d^2x^4\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}+\frac{3}{8}d^2x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\\ &+\frac{1}{4}c^2d^2x^3\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\\ &-\frac{2d^2\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)\,(a+b\arcsin(cx))}{3c}\\ &+\frac{5d^2\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] 3/8*d^2*x*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)+1/4*c^2*d^2*x^
3*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)-2/3*d^2*(-c^2*x^2+1)*(
a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/c+2/3*b*d^2*x*(c*d*x+d)^(
1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-3/16*b*c*d^2*x^2*(c*d*x+d)^(1/2)*(
-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-2/9*b*c^2*d^2*x^3*(c*d*x+d)^(1/2)*(-c*f*
x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/16*b*c^3*d^2*x^4*(c*d*x+d)^(1/2)*(-c*f*x+f)
^(1/2)/(-c^2*x^2+1)^(1/2)+5/16*d^2*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*
f*x+f)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 376, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4763, 4847, 4741, 4737, 30, 4767, 4783, 4795}

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx=\frac{1}{4}c^2d^2x^3\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))+\frac{5d^2\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}-\frac{2d^2(1-c^2x^2)\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))}{3c}+\frac{3}{8}d^2x\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))-\frac{3bcd^2x^2\sqrt{cdx+d}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}+\frac{2bd^2x\sqrt{cdx+d}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{2bc^2d^2x^3\sqrt{cdx+d}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}-\frac{bc^3d^2x^4\sqrt{cdx+d}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}$$

```
[In] Int[(d + c*d*x)^(5/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*b*d^2*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(3*Sqrt[1 - c^2*x^2]) - (3*b*c*
d^2*x^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) - (2*b*c^2*
d^2*x^3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*d^2
*x^4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) + (3*d^2*x*Sqr
t[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/8 + (c^2*d^2*x^3*Sqrt[d +
 c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/4 - (2*d^2*Sqrt[d + c*d*x]*Sqr
t[f - c*f*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (5*d^2*Sqrt[d + c*d
*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
```

```
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
```

```
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\text{integral} = \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int (d+cdx)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \left(d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))+2cd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))+c^2\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(2cd^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(c^2d^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}d^2x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{1}{4}c^2d^2x^3\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) - \frac{2d^2\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c} + \frac{\left(d^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} + \frac{\left(2bd^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int (1-c^2x^2)\,dx}{3\sqrt{1-c^2x^2}} - \frac{\left(bcd^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x\,dx}{2\sqrt{1-c^2x^2}} + \frac{\left(c^2d^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(bc^3d^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x^3\,dx}{4\sqrt{1-c^2x^2}}$$

$$= \frac{2bd^2x\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{bcd^2x^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} - \frac{2bc^2d^2x^3\sqrt{d+cdx}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}} - \frac{bc^3d^2x^4\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}} + \frac{3}{8}d^2x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{1}{4}c^2d^2x^3\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) - \frac{2d^2\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c} + \frac{d^2\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}} + \frac{\left(d^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} + \frac{\left(bcd^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x\,dx}{8\sqrt{1-c^2x^2}}$$

$$= \frac{2bd^2x\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{3bcd^2x^2\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}} - \frac{2bc^2d^2x^3\sqrt{d+cdx}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}} - \frac{bc^3d^2x^4\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}} + \frac{3}{8}d^2x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{1}{4}c^2d^2x^3\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) - \frac{2d^2\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c} + \frac{5d^2\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 2.69 (sec) , antiderivative size = 293, normalized size of antiderivative = 0.78

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \frac{360bd^2\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2 - 720ad^{5/2}\sqrt{f}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right)}{}$$

```
[In] Integrate[(d + c*d*x)^(5/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (360*b*d^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 720*a*d^(5/2)*Sq
rt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[
d]*Sqrt[f]*(-1 + c^2*x^2))] + d^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-256*b*c
*x*(-3 + c^2*x^2) + 48*a*Sqrt[1 - c^2*x^2]*(-16 + 9*c*x + 16*c^2*x^2 + 6*c^
```

```
3*x^3) + 144*b*Cos[2*ArcSin[c*x]] - 9*b*Cos[4*ArcSin[c*x]]) + 12*b*d^2*Sqrt
[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(-64*(1 - c^2*x^2)^(3/2) + 24*Sin[2
*ArcSin[c*x]] - 3*Sin[4*ArcSin[c*x]]))/(1152*c*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int (cdx+d)^{\frac{5}{2}} (a+b\arcsin(cx)) \sqrt{-cfx+f}dx$$

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

Fricas [F]

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{5}{2}}\sqrt{-cfx+f}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
fricas")
[Out] integral((a*c^2*d^2*x^2 + 2*a*c*d^2*x + a*d^2 + (b*c^2*d^2*x^2 + 2*b*c*d^2*
x + b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))*(-c*f*x+f)**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{5}{2}}\sqrt{-cfx+f}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
maxima")
[Out] b*sqrt(d)*sqrt(f)*integrate((c^2*d^2*x^2 + 2*c*d^2*x + d^2)*sqrt(c*x + 1)*s
qrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/24*(15*sqr
t(-c^2*d*f*x^2 + d*f)*d^2*x + 15*d^3*f*arcsin(c*x)/(sqrt(d*f)*c) - 6*(-c^2*
d*f*x^2 + d*f)^(3/2)*d*x/f - 16*(-c^2*d*f*x^2 + d*f)^(3/2)*d/(c*f))*a
```

Giac [F]

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{5}{2}}\sqrt{-cfx+f}(b\arcsin{(cx)}+a)\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx=\int (a+b\,\mathrm{asin}(c\,x))\,\left(d+c\,d\,x\right)^{5/2}\,\sqrt{f-c\,f\,x}\,dx$$

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(1/2), x)
```

3.505 $\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 273

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx=\frac{bdx\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{bcdx^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}-\frac{bc^2dx^3\sqrt{d+cdx}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}+\frac{1}{2}dx\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))-\frac{d\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)\,(a+b\arcsin(cx))}{3c}+\frac{d\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}$$

```
[Out] 1/2*d*x*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)-1/3*d*(-c^2*x^2+
1)*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/c+1/3*b*d*x*(c*d*x+d)
^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/4*b*c*d*x^2*(c*d*x+d)^(1/2)*(-
c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/9*b*c^2*d*x^3*(c*d*x+d)^(1/2)*(-c*f*x+f
)^(1/2)/(-c^2*x^2+1)^(1/2)+1/4*d*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*f*
x+f)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4763, 4847, 4741, 4737, 30, 4767}

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \frac{d\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}} - \frac{d(1-c^2x^2)\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))}{3c} + \frac{1}{2}dx\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx)) - \frac{bcdx^2\sqrt{cdx+d}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} + \frac{bdx\sqrt{cdx+d}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{bc^2dx^3\sqrt{cdx+d}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}$$

```
[In] Int[(d + c*d*x)^(3/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(3*Sqrt[1 - c^2*x^2]) - (b*c*d*x^2*
Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(4*Sqrt[1 - c^2*x^2]) - (b*c^2*d*x^3*Sqrt[
d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) + (d*x*Sqrt[d + c*d*x]*Sq
rt[f - c*f*x]*(a + b*ArcSin[c*x]))/2 - (d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(
1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x
]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
```

```
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int (d+cdx)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} \\
&= \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \left(d\sqrt{1-c^2x^2}(a+b\arcsin(cx))+cdx\sqrt{1-c^2x^2}(a+b\arcsin(cx))\right)\,dx}{\sqrt{1-c^2x^2}} \\
&= \frac{\left(d\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(cd\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{1}{2}dx\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) - \frac{d\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c} + \frac{\left(d\sqrt{d+cdx}\sqrt{f-cfx}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} + \frac{\left(bd\sqrt{d+cdx}\sqrt{f-cfx}\right)\int(1-c^2x^2)\,dx}{3\sqrt{1-c^2x^2}} - \frac{\left(bcd\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x\,dx}{2\sqrt{1-c^2x^2}}$$

$$= \frac{bdx\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{bcdx^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} - \frac{bc^2dx^3\sqrt{d+cdx}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}} + \frac{1}{2}dx\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) - \frac{d\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c} + \frac{d\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 1.88 (sec) , antiderivative size = 260, normalized size of antiderivative = 0.95

$$\int(d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \frac{18bd\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2 - 36ad^{3/2}\sqrt{f}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right) + d}{}$$

```
[In] Integrate[(d + c*d*x)^(3/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (18*b*d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 36*a*d^(3/2)*Sqrt[f
]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*S
qrt[f]*(-1 + c^2*x^2))] + d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-8*b*c*x*(-3 +
 c^2*x^2) + 12*a*Sqrt[1 - c^2*x^2]*(-2 + 3*c*x + 2*c^2*x^2) + 9*b*Cos[2*Arc
Sin[c*x]]) + 6*b*d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(-4*(1 - c^2
*x^2)^(3/2) + 3*Sin[2*ArcSin[c*x]]))/(72*c*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int (cdx+d)^{\frac{3}{2}} (a+b\arcsin(cx)) \sqrt{-cfx+f}dx$$

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

Fricas [F]

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{3}{2}}\sqrt{-cfx+f}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
fricas")
[Out] integral((a*c*d*x + a*d + (b*c*d*x + b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt
(-c*f*x + f), x)
```

Sympy [F]

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int (d(cx+1))^{\frac{3}{2}}\sqrt{-f(cx-1)}(a+b\operatorname{asin}(cx))\,dx$$

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))*(-c*f*x+f)**(1/2),x)
[Out] Integral((d*(c*x + 1))**(3/2)*sqrt(-f*(c*x - 1))*(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{3}{2}}\sqrt{-cfx+f}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
maxima")
[Out] b*sqrt(d)*sqrt(f)*integrate((c*d*x + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/6*(3*sqrt(-c^2*d*f*x^2 + d*f)*
d*x + 3*d^2*f*arcsin(c*x)/(sqrt(d*f)*c) - 2*(-c^2*d*f*x^2 + d*f)^(3/2)/(c*f
))*a
```

Giac [F]

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{3}{2}}\sqrt{-cfx+f}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
giac")
[Out] integrate((c*d*x + d)^(3/2)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\left(d+c\,d\,x\right)^{3/2}\,\sqrt{f-c\,f\,x}\,dx$$

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(1/2),x)
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(1/2), x)
```

3.506 $\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 134

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = -\frac{bcx^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}$$

```
[Out] 1/2*x*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)-1/4*b*c*x^2*(c*d*x
+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+1/4*(a+b*arcsin(c*x))^2*(c*d*
x+d)^(1/2)*(-c*f*x+f)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {4763, 4741, 4737, 30}

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \frac{\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx)) - \frac{bcx^2\sqrt{cdx+d}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}$$

```
[In] Int[Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/4*(b*c*x^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/Sqrt[1 - c^2*x^2] + (x*Sqrt[
d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/2 + (Sqrt[d + c*d*x]*Sqrt[f
 - c*f*x]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} \\
&= \frac{1}{2}x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) \\
&\quad+\frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}-\frac{\left(bc\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x\,dx}{2\sqrt{1-c^2x^2}} \\
&= -\frac{bcx^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}+\frac{1}{2}x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) \\
&\quad+\frac{\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.03 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.54

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx$$
$$=\frac{1}{2}ax\sqrt{-f(-1+cx)}\sqrt{d(1+cx)}-\frac{a\sqrt{d}\sqrt{f}\arctan\left(\frac{cx\sqrt{-f(-1+cx)}\sqrt{d(1+cx)}}{\sqrt{d}\sqrt{f}(-1+cx)(1+cx)}\right)}{2c}+\frac{b\sqrt{d+cdx}\sqrt{f-cfx}\sqrt{-df(1-c^2x^2)}(\cos(2\arcsin(cx))+2\arcsin(cx)(\arcsin(cx)+\sin(2\arcsin(cx))))}{8c\sqrt{(-d-cdx)(f-cfx)}\sqrt{1-c^2x^2}}$$

```
[In] Integrate[Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

```
[Out] (a*x*Sqrt[-(f*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/2 - (a*Sqrt[d]*Sqrt[f]*ArcTan
[(c*x*Sqrt[-(f*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[f]*(-1 + c*x)*
(1 + c*x))]])/(2*c) + (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Sqrt[-(d*f*(1 - c^2
*x^2))]*(Cos[2*ArcSin[c*x]] + 2*ArcSin[c*x]*(ArcSin[c*x] + Sin[2*ArcSin[c*x
]])))/(8*c*Sqrt[(-d - c*d*x)*(f - c*f*x)]*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int \sqrt{cdx+d}\,(a+b\arcsin(cx))\,\sqrt{-cfx+f}dx$$

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x)
```

Fricas [F]

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx=\int \sqrt{cdx+d}\sqrt{-cfx+f}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int \sqrt{d\,(cx+1)}\sqrt{-f\,(cx-1)}(a+b\,\mathrm{asin}\,(cx))\,\,dx$$

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))*(-c*f*x+f)**(1/2),x)
[Out] Integral(sqrt(d*(c*x + 1))*sqrt(-f*(c*x - 1))*(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int \sqrt{cdx+d}\sqrt{-cfx+f}(b\arcsin\,(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
maxima")
[Out] b*sqrt(d)*sqrt(f)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)), x) + 1/2*(sqrt(-c^2*d*f*x^2 + d*f)*x + d*f*arcsin
(c*x)/(sqrt(d*f)*c))*a
```

Giac [F]

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int \sqrt{cdx+d}\sqrt{-cfx+f}(b\arcsin\,(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))*(-c*f*x+f)^(1/2),x, algorithm="
giac")
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\sqrt{d+c\,d\,x}\,\sqrt{f-c\,f\,x}\,dx$$

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(1/2),x)
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(1/2), x)
```

3.507 $\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 141

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = -\frac{bfx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{f(1-c^2x^2)\,(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}$$

```
[Out] f*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-b*f*x*(
-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/2*f*(a+b*arcsin(c*x))^
2*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4763, 4847, 4737, 4767, 8}

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{cdx+d}\sqrt{f-cfx}} + \frac{f(1-c^2x^2)\,(a+b\arcsin(cx))}{c\sqrt{cdx+d}\sqrt{f-cfx}} - \frac{bfx\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

```
[In] Int[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] -((b*f*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x])) + (f*(1 - c^
2*x^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (f*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(f-cfx)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}\\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}-\frac{cfx(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\sqrt{f-cfx}}\\
&= \frac{\left(f\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{\left(cf\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}\\
&= \frac{f(1-c^2x^2)\left(a+b\arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{\left(bf\sqrt{1-c^2x^2}\right)\int 1\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}
\end{aligned}$$

$$= -\frac{bfx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{f(1-c^2x^2)(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}$$

Mathematica [A] (verified)

Time = 1.62 (sec) , antiderivative size = 200, normalized size of antiderivative = 1.42

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx$$
$$= \frac{\frac{2\sqrt{d+cdx}\sqrt{f-cfx}\left(-bcx+a\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} + 2b\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx) + \frac{b\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2}{\sqrt{1-c^2x^2}} - 2a\sqrt{d}\sqrt{f}\,\mathrm{arc}}{2cd}$$

```
[In] Integrate[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] ((2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-(b*c*x) + a*Sqrt[1 - c^2*x^2]))/Sqrt[
1 - c^2*x^2] + 2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x] + (b*Sqrt[d
+ c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] - 2*a*Sqrt[d]*Sqr
t[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^
2*x^2))])/(2*c*d)
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))\sqrt{-cfx+f}}{\sqrt{cdx+d}}dx$$

```
[In] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x)
```

Fricas [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \int \frac{\sqrt{-cfx+f}(b\arcsin(cx)+a)}{\sqrt{cdx+d}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

Sympy [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \int \frac{\sqrt{-f\left(cx-1\right)}(a+b\operatorname{asin}\left(cx\right))}{\sqrt{d\left(cx+1\right)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))*(-c*f*x+f)**(1/2)/(c*d*x+d)**(1/2),x)
[Out] Integral(sqrt(-f*(c*x - 1))*(a + b*asin(c*x))/sqrt(d*(c*x + 1)), x)
```

Maxima [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \int \frac{\sqrt{-cfx+f}(b\arcsin\left(cx\right)+a)}{\sqrt{cdx+d}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x, algorithm="
maxima")
[Out] a*(f*arcsin(c*x)/(c*d*sqrt(f/d)) + sqrt(-c^2*d*f*x^2 + d*f)/(c*d)) + b*sqrt
(f)*integrate(sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/sqr
t(c*x + 1), x)/sqrt(d)
```

Giac [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \int \frac{\sqrt{-cfx+f}(b\arcsin\left(cx\right)+a)}{\sqrt{cdx+d}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2),x, algorithm="
giac")
[Out] integrate(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \int \frac{\left(a+b\operatorname{asin}(c\,x)\right)\,\sqrt{f-c\,f\,x}}{\sqrt{d+c\,d\,x}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(1/2),x)
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(1/2), x)
```

3.508 $\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 162

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=-\frac{2f^2(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{f^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{2bf^2\left(1-c^2x^2\right)^{3/2}\log(1+cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] -2*f^2*(-c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)
^(3/2)-1/2*f^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/b/c/(c*d*x+d)^(3/2)/(
-c*f*x+f)^(3/2)+2*b*f^2*(-c^2*x^2+1)^(3/2)*ln(c*x+1)/c/(c*d*x+d)^(3/2)/(-c*
f*x+f)^(3/2)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4763, 4859, 651, 4845, 12, 641, 31, 4737}

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=-\frac{f^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{2f^2(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{2bf^2\left(1-c^2x^2\right)^{3/2}\log(cx+1)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[In] Int[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] (-2*f^2*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(
f - c*f*x)^(3/2)) - (f^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(2*b*c*
```

```
(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (2*b*f^2*(1 - c^2*x^2)^(3/2)*Log[1 +
 c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
```

```
, 3])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{(1-c^2x^2)^{3/2}\int \frac{(f-cfx)^2(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{(1-c^2x^2)^{3/2}\int \left(\frac{2(f^2-cf^2x)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}-\frac{f^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{\left(2(1-c^2x^2)^{3/2}\right)\int \frac{(f^2-cf^2x)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{\left(f^2(1-c^2x^2)^{3/2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{f^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{\left(2bc(1-c^2x^2)^{3/2}\right)\int \frac{f^2(1-cx)}{c(1-c^2x^2)}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{f^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{\left(2bf^2(1-c^2x^2)^{3/2}\right)\int \frac{1-cx}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{f^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{\left(2bf^2(1-c^2x^2)^{3/2}\right)\int \frac{1}{1+cx}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{2f^2(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{f^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{2bf^2(1-c^2x^2)^{3/2}\log(1+cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 2.45 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.53

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx =$$
$$-\frac{\frac{4a\sqrt{d+cdx}\sqrt{f-cfx}}{1+cx}-2a\sqrt{d}\sqrt{f}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right)+\frac{b\sqrt{d+cdx}\sqrt{f-cfx}\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)(\arcsin(cx)(4+\arcsin(cx))-8\log(\right.}{}}{2cd^2}$$

```
[In] Integrate[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] -1/2*((4*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(1 + c*x) - 2*a*Sqrt[d]*Sqrt[f]
*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^
2))] + (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[c*x]*
(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + ((-4
+ ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]
)*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[
c*x]/2])))/(c*d^2)
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))\sqrt{-cfx+f}}{(cdx+d)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x)
```

Fricas [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{\sqrt{-cfx+f}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^2*d^2*x^2
+ 2*c*d^2*x + d^2), x)
```

Sympy [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{\sqrt{-f\,(cx-1)}(a+b\,\mathrm{asin}\,(cx))}{(d\,(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))*(-c*f*x+f)**(1/2)/(c*d*x+d)**(3/2),x)
[Out] Integral(sqrt(-f*(c*x - 1))*(a + b*asin(c*x))/(d*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{\sqrt{-cfx+f}(b\arcsin\,(cx)+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x, algorithm="
maxima")
[Out] -a*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d^2*x + c*d^2) + f*arcsin(c*x)/(c*d^2*s
qrt(f/d))) + b*sqrt(f)*integrate(sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1))/((c*d*x + d)*sqrt(c*x + 1)), x)/sqrt(d)
```

Giac [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{\sqrt{-cfx+f}(b\arcsin\,(cx)+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2),x, algorithm="
giac")
[Out] integrate(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c*d*x + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{f-c\,f\,x}}{(d+c\,d\,x)^{3/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(3/2),x)
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(3/2), x)
```

3.509 $\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 163

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = -\frac{2bf^3(1-c^2x^2)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{f^3(1-cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bf^3(1-c^2x^2)^{5/2}\log(1+cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] -2/3*b*f^3*(-c^2*x^2+1)^(5/2)/c/(c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-1/
3*f^3*(-c*x+1)^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f
)^(5/2)-1/3*b*f^3*(-c^2*x^2+1)^(5/2)*ln(c*x+1)/c/(c*d*x+d)^(5/2)/(-c*f*x+f)
^(5/2)
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4763, 665, 4845, 12, 641, 45}

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = -\frac{f^3(1-cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{2bf^3(1-c^2x^2)^{5/2}}{3c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{bf^3(1-c^2x^2)^{5/2}\log(cx+1)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[In] Int[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] (-2*b*f^3*(1 - c^2*x^2)^(5/2))/(3*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) - (f^3*(1 - c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d
```

```
*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*f^3*(1 - c^2*x^2)^(5/2)*Log[1 + c*x])/(3*
c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 665

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^m*((a + c*x^2)^(p + 1)/(2*c*d*(p + 1))), x] /; FreeQ[{a, c, d,
e, m, p}, x] && EqQ[c*d^2 + a*e^2, 0] &&  !IntegerQ[p] && EqQ[m + 2*p + 2,
0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int \frac{(f-cfx)^3(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f^3(1-cx)^3\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc(1-c^2x^2)^{5/2}\right)\int -\frac{f^3(1-cx)^3}{3c(1-c^2x^2)^2}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f^3(1-cx)^3\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bf^3(1-c^2x^2)^{5/2}\right)\int \frac{(1-cx)^3}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f^3(1-cx)^3\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bf^3(1-c^2x^2)^{5/2}\right)\int \frac{1-cx}{(1+cx)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f^3(1-cx)^3\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bf^3(1-c^2x^2)^{5/2}\right)\int \left(\frac{1}{-1-cx}+\frac{2}{(1+cx)^2}\right)dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2bf^3(1-c^2x^2)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{f^3(1-cx)^3\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bf^3(1-c^2x^2)^{5/2}\log(1+cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

Mathematica [A] (verified)

Time = 1.85 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.70

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = -\frac{f\sqrt{d+cdx}\left((-1+cx)\left(-a+acx-b\sqrt{1-c^2x^2}\right)+b(-1+cx)^2\arcsin(cx)+b(1+cx)\sqrt{1-c^2x^2}\log(-f(1\right.}{3cd^3(1+cx)^2\sqrt{f-cfx}}$$

```
[In] Integrate[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] -1/3*(f*Sqrt[d + c*d*x]*((-1 + c*x)*(-a + a*c*x - b*Sqrt[1 - c^2*x^2]) + b*
(-1 + c*x)^2*ArcSin[c*x] + b*(1 + c*x)*Sqrt[1 - c^2*x^2]*Log[-(f*(1 + c*x))
]))/(c*d^3*(1 + c*x)^2*Sqrt[f - c*f*x])
```

Maple [F]

$$\int \frac{(a + b \arcsin(cx)) \sqrt{-cfx + f}}{(cdx + d)^{\frac{5}{2}}} dx$$

[In] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x)

[Out] int((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x)

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 520, normalized size of antiderivative = 3.19

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \left[\frac{(bc^3dx^3+bc^2dx^2-bcdx-bd)\sqrt{\frac{f}{d}}\log\left(\frac{c^6fx^6+4c^5fx^5+5c^4fx^4-4c^2fx^2-4cf}{}\right.}{}\right.$$

$$-\frac{(bc^3dx^3+bc^2dx^2-bcdx-bd)\sqrt{-\frac{f}{d}}\arctan\left(\frac{(c^2x^2+2cx+2)\sqrt{-c^2x^2+1}\sqrt{cdx+d}\sqrt{-cfx+f}\sqrt{-\frac{f}{d}}}{c^4fx^4+2c^3fx^3-c^2fx^2-2cfx}\right)-\left(ac^2x^2-2\sqrt{-c^2}\right.}{3\left(c^4d^3x^3+c^3d^3x^2-c^2d^3x-c\right.}$$

[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x, algorithm="fricas")

[Out] [1/6*((b*c^3*d*x^3 + b*c^2*d*x^2 - b*c*d*x - b*d)*sqrt(f/d)*log((c^6*f*x^6 + 4*c^5*f*x^5 + 5*c^4*f*x^4 - 4*c^2*f*x^2 - 4*c*f*x + (c^4*x^4 + 4*c^3*x^3 + 6*c^2*x^2 + 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(f/d) - 2*f)/(c^4*x^4 + 2*c^3*x^3 - 2*c*x - 1)) + 2*(a*c^2*x^2 - 2*sqrt(-c^2*x^2 + 1)*b*c*x - 2*a*c*x + (b*c^2*x^2 - 2*b*c*x + b)*arcsin(c*x) + a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*x^3 + c^3*d^3*x^2 - c^2*d^3*x - c*d^3), -1/3*((b*c^3*d*x^3 + b*c^2*d*x^2 - b*c*d*x - b*d)*sqrt(-f/d)*arctan((c^2*x^2 + 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(-f/d)/(c^4*f*x^4 + 2*c^3*f*x^3 - c^2*f*x^2 - 2*c*f*x)) - (a*c^2*x^2 - 2*sqrt(-c^2*x^2 + 1)*b*c*x - 2*a*c*x + (b*c^2*x^2 - 2*b*c*x + b)*arcsin(c*x) + a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*x^3 + c^3*d^3*x^2 - c^2*d^3*x - c*d^3)]

Sympy [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \int \frac{\sqrt{-f\,(cx-1)}(a+b\,\mathrm{asin}\,(cx))}{(d\,(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))*(-c*f*x+f)**(1/2)/(c*d*x+d)**(5/2),x)
[Out] Integral(sqrt(-f*(c*x - 1))*(a + b*asin(c*x))/(d*(c*x + 1))**(5/2), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.32

$$\begin{aligned}\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx &= -\frac{1}{3}\,bc\left(\frac{2\sqrt{f}}{c^3d^{\frac{5}{2}}x+c^2d^{\frac{5}{2}}}+\frac{\sqrt{f}\log\,(cx+1)}{c^2d^{\frac{5}{2}}}\right)\\&\quad-\frac{1}{3}\,b\left(\frac{2\sqrt{-c^2dfx^2+df}}{c^3d^3x^2+2\,c^2d^3x+cd^3}-\frac{\sqrt{-c^2dfx^2+df}}{c^2d^3x+cd^3}\right)\arcsin\,(cx)\\&\quad-\frac{1}{3}\,a\left(\frac{2\sqrt{-c^2dfx^2+df}}{c^3d^3x^2+2\,c^2d^3x+cd^3}-\frac{\sqrt{-c^2dfx^2+df}}{c^2d^3x+cd^3}\right)\end{aligned}$$

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x, algorithm="
maxima")
[Out] -1/3*b*c*(2*sqrt(f)/(c^3*d^(5/2)*x + c^2*d^(5/2)) + sqrt(f)*log(c*x + 1)/(c
^2*d^(5/2))) - 1/3*b*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d^3*x^2 + 2*c^2*d^3*x
 + c*d^3) - sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d^3*x + c*d^3))*arcsin(c*x) - 1/3
*a*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d^3*x^2 + 2*c^2*d^3*x + c*d^3) - sqrt(-
c^2*d*f*x^2 + d*f)/(c^2*d^3*x + c*d^3))
```

Giac [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \int \frac{\sqrt{-cfx+f}(b\arcsin\,(cx)+a)}{(cdx+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))*(-c*f*x+f)^(1/2)/(c*d*x+d)^(5/2),x, algorithm="
giac")
[Out] integrate(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c*d*x + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{f-c\,f\,x}}{(d+c\,d\,x)^{5/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(5/2),x)
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(5/2), x)
```

3.510 $\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 414

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\frac{bdx(d+cdx)^{3/2}(f-cfx)^{3/2}}{5(1-c^2x^2)^{3/2}}-\frac{5bcdx^2(d+cdx)^{3/2}(f-cfx)^{3/2}}{16(1-c^2x^2)^{3/2}}-\frac{2bc^2dx^3(d+cdx)^{3/2}(f-cfx)^{3/2}}{15(1-c^2x^2)^{3/2}}+\frac{bc^3dx^4(d+cdx)^{3/2}(f-cfx)^{3/2}}{16(1-c^2x^2)^{3/2}}+\frac{bc^4dx^5(d+cdx)^{3/2}(f-cfx)^{3/2}}{25(1-c^2x^2)^{3/2}}+\frac{1}{4}dx(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))+\frac{3dx(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))}{8(1-c^2x^2)}-\frac{d(d+cdx)^{3/}}{}$$

```
[Out] 1/5*b*d*x*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)-5/16*b*c*d*x^
2*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)-2/15*b*c^2*d*x^3*(c*d
*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+1/16*b*c^3*d*x^4*(c*d*x+d)^
(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+1/25*b*c^4*d*x^5*(c*d*x+d)^(3/2)*
(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+1/4*d*x*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2
)*(a+b*arcsin(c*x))+3/8*d*x*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*
x))/(-c^2*x^2+1)-1/5*d*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(-c^2*x^2+1)*(a+b*a
rcsin(c*x))/c+3/16*d*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))^2/b
/c/(-c^2*x^2+1)^(3/2)
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 414, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {4763, 4847, 4743, 4741, 4737, 30, 14, 4767, 200}

$$\int (d + cdx)^{5/2}(f - cfx)^{3/2}(a + b\arcsin(cx))\,dx = \frac{3dx(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))}{8(1-c^2x^2)} + \frac{3d(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))^2}{16bc(1-c^2x^2)^{3/2}} - \frac{d(1-c^2x^2)(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))}{5c} + \frac{1}{4}dx(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx)) - \frac{5bcdx^2(cdx+d)^{3/2}(f-cfx)^{3/2}}{16(1-c^2x^2)^{3/2}} + \frac{bdx(cdx+d)^{3/2}(f-cfx)}{5(1-c^2x^2)^{3/2}}$$

```
[In] Int[(d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*d*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(5*(1 - c^2*x^2)^(3/2)) - (5*b*
c*d*x^2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) - (2*
b*c^2*d*x^3*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(15*(1 - c^2*x^2)^(3/2)) +
 (b*c^3*d*x^4*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2))
 + (b*c^4*d*x^5*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(25*(1 - c^2*x^2)^(3/2
)) + (d*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*d
*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2
)) - (d*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x
]))/(5*c) + (3*d*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x])^2)
/(16*b*c*(1 - c^2*x^2)^(3/2))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
```

```
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\text{integral} = \frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int(d+cdx)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx}{(1-c^2x^2)^{3/2}}$$

$$= \frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int\left(d(1-c^2x^2)^{3/2}(a+b\arcsin(cx))+cdx(1-c^2x^2)^{3/2}(a+b\arcsin(c$$

$$(1-c^2x^2)^{3/2}$$

$$= \frac{\left(d(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{(1-c^2x^2)^{3/2}} + \frac{\left(cd(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{(1-c^2x^2)^{3/2}}$$

$$= \frac{1}{4}dx(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx)) - \frac{d(d+cdx)^{3/2}(f-cfx)^{3/2}\left(1-c^2x^2\right)(a+b\arcsin(cx))}{5c} + \frac{\left(3d(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{4\left(1-c^2x^2\right)^{3/2}} + \frac{\left(bd(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int\left(1-c^2x^2\right)^2\,dx}{5\left(1-c^2x^2\right)^{3/2}} - \frac{\left(bcd(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int x(1-c^2x^2)\,dx}{4\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}dx(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx)) + \frac{3dx(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))}{8\left(1-c^2x^2\right)} - \frac{d(d+cdx)^{3/2}(f-cfx)^{3/2}\left(1-c^2x^2\right)(a+b\arcsin(cx))}{5c} + \frac{\left(3d(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{8\left(1-c^2x^2\right)^{3/2}} + \frac{\left(bd(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int\left(1-2c^2x^2+c^4x^4\right)\,dx}{5\left(1-c^2x^2\right)^{3/2}} - \frac{\left(bcd(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int\left(x-c^2x^3\right)\,dx}{4\left(1-c^2x^2\right)^{3/2}} - \frac{\left(3bcd(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int x\,dx}{8\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{bdx(d+cdx)^{3/2}(f-cfx)^{3/2}}{5\left(1-c^2x^2\right)^{3/2}} - \frac{5bcdx^2(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}} - \frac{2bc^2dx^3(d+cdx)^{3/2}(f-cfx)^{3/2}}{15\left(1-c^2x^2\right)^{3/2}} + \frac{bc^3dx^4(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}} + \frac{bc^4dx^5(d+cdx)^{3/2}(f-cfx)^{3/2}}{25\left(1-c^2x^2\right)^{3/2}} + \frac{1}{4}dx(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx)) + \frac{3dx(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))}{8\left(1-c^2x^2\right)} - \frac{d}{}$$

Mathematica [A] (verified)

Time = 2.74 (sec) , antiderivative size = 305, normalized size of antiderivative = 0.74

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \frac{d^2f\left(1800b\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2 - 3600a\sqrt{d}\sqrt{f}\sqrt{1-c^2x^2}\arctan\left(\right.\right.}{}$$

```
[In] Integrate[(d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*f*(1800*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 3600*a*Sqrt[
d]*Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(
Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(128*b*c
*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) - 240*a*Sqrt[1 - c^2*x^2]*(8 - 25*c*x - 16
*c^2*x^2 + 10*c^3*x^3 + 8*c^4*x^4) + 1200*b*Cos[2*ArcSin[c*x]] + 75*b*Cos[4
*ArcSin[c*x]]) - 60*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(32*(1 -
c^2*x^2)^(5/2) - 40*Sin[2*ArcSin[c*x]] - 5*Sin[4*ArcSin[c*x]])))/(9600*c*Sq
rt[1 - c^2*x^2])
```

Maple [F]

$$\int (cdx+d)^{\frac{5}{2}}\,(-cfx+f)^{\frac{3}{2}}\,(a+b\arcsin(cx))\,dx$$

```
[In] int((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
[Out] integral(-(a*c^3*d^2*f*x^3 + a*c^2*d^2*f*x^2 - a*c*d^2*f*x - a*d^2*f + (b*c
^3*d^2*f*x^3 + b*c^2*d^2*f*x^2 - b*c*d^2*f*x - b*d^2*f)*arcsin(c*x))*sqrt(c
*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(5/2)*(-c*f*x+f)**(3/2)*(a+b*asin(c*x)),x)
[Out] Timed out
```

Maxima [F]

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
[Out] b*sqrt(d)*sqrt(f)*integrate(-(c^3*d^2*f*x^3 + c^2*d^2*f*x^2 - c*d^2*f*x - d
^2*f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)), x) + 1/40*(15*sqrt(-c^2*d*f*x^2 + d*f)*d^2*f*x + 15*d^3*f^2*arcsin(c*x)
/(sqrt(d*f)*c) + 10*(-c^2*d*f*x^2 + d*f)^(3/2)*d*x - 8*(-c^2*d*f*x^2 + d*f)
^(5/2)/(c*f))*a
```

Giac [F]

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
[Out] integrate((c*d*x + d)^(5/2)*(-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int (a+b\,\mathrm{asin}(c\,x))\,(d+c\,d\,x)^{5/2}\,(f-c\,f\,x)^{3/2}\,dx$$

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(3/2),x)
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(3/2), x)
```

3.511 $\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 226

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = -\frac{5bcx^2(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}} + \frac{bc^3x^4(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}} + \frac{1}{4}x(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx)) + \frac{3x(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))}{8\left(1-c^2x^2\right)} + \frac{3(d+cdx)^{3/2}}{}$$

```
[Out] -5/16*b*c*x^2*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+1/16*b*c^
3*x^4*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+1/4*x*(c*d*x+d)^(
3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))+3/8*x*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3
/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)+3/16*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a
+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(3/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 226, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4763, 4743, 4741, 4737, 30, 14}

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \frac{3x(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))}{8\left(1-c^2x^2\right)} + \frac{3(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))^2}{16bc\left(1-c^2x^2\right)^{3/2}} + \frac{1}{4}x(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx)) - \frac{5bcx^2(cdx+d)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}} + \frac{bc^3x^4(cdx+d)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}}$$

```
[In] Int[(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-5*b*c*x^2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) +
 (b*c^3*x^4*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) +
 (x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*x*(d +
c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)) + (3*
(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(16*b*c*(1 - c^2
*x^2)^(3/2))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\text{integral} = \frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}x(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx)) + \frac{\left(3(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{4\left(1-c^2x^2\right)^{3/2}} - \frac{\left(bc(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int x\left(1-c^2x^2\right)\,dx}{4\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}x(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx)) + \frac{3x(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))}{8\left(1-c^2x^2\right)} + \frac{\left(3(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{8\left(1-c^2x^2\right)^{3/2}} - \frac{\left(bc(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \left(x-c^2x^3\right)\,dx}{4\left(1-c^2x^2\right)^{3/2}} - \frac{\left(3bc(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int x\,dx}{8\left(1-c^2x^2\right)^{3/2}}$$

$$= -\frac{5bcx^2(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}} + \frac{bc^3x^4(d+cdx)^{3/2}(f-cfx)^{3/2}}{16\left(1-c^2x^2\right)^{3/2}} + \frac{1}{4}x(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx)) + \frac{3x(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))}{8\left(1-c^2x^2\right)} + \frac{3(}{}$$

Mathematica [A] (verified)

Time = 2.28 (sec) , antiderivative size = 247, normalized size of antiderivative = 1.09

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \frac{24bdf\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2-48ad^{3/2}f^{3/2}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+c}}{\sqrt{d}\sqrt{f}(}\right.}{}$$

```
[In] Integrate[(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (24*b*d*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 48*a*d^(3/2)*f^(3
/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]
*Sqrt[f]*(-1 + c^2*x^2))] + d*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(16*a*c*x*(
5 - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] + 16*b*Cos[2*ArcSin[c*x]] + b*Cos[4*ArcSin
[c*x]]) + 4*b*d*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(8*Sin[2*ArcS
in[c*x]] + Sin[4*ArcSin[c*x]]))/(128*c*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int (cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}(a+b\arcsin(cx))\,dx$$

```
[In] int((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c^2*d*f*x^2 - a*d*f + (b*c^2*d*f*x^2 - b*d*f)*arcsin(c*x))*sqr
t(c*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \int (d(cx+1))^{\frac{3}{2}}\left(-f(cx-1)\right)^{\frac{3}{2}}\left(a+b\,\mathrm{asin}\,(cx)\right)\,dx$$

```
[In] integrate((c*d*x+d)**(3/2)*(-c*f*x+f)**(3/2)*(a+b*asin(c*x)),x)
[Out] Integral((d*(c*x + 1))**(3/2)*(-f*(c*x - 1))**(3/2)*(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
[Out] b*sqrt(d)*sqrt(f)*integrate(-(c^2*d*f*x^2 - d*f)*sqrt(c*x + 1)*sqrt(-c*x +
1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/8*(3*sqrt(-c^2*d*f*x^
2 + d*f)*d*f*x + 3*d^2*f^2*arcsin(c*x)/(sqrt(d*f)*c) + 2*(-c^2*d*f*x^2 + d*
f)^(3/2)*x)*a
```

Giac [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
[Out] integrate((c*d*x + d)^(3/2)*(-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int (a+b\,\mathrm{asin}(c\,x))\,\left(d+c\,d\,x\right)^{3/2}\,\left(f-c\,f\,x\right)^{3/2}\,dx$$

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2),x)
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2), x)
```

3.512 $\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 273

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = -\frac{bfx\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{bcfx^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}+\frac{bc^2fx^3\sqrt{d+cdx}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}+\frac{1}{2}fx\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))+\frac{f\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c}+\frac{f\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}$$

```
[Out] 1/2*f*x*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)+1/3*f*(-c^2*x^2+
1)*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/c-1/3*b*f*x*(c*d*x+d)
^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/4*b*c*f*x^2*(c*d*x+d)^(1/2)*(-
c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+1/9*b*c^2*f*x^3*(c*d*x+d)^(1/2)*(-c*f*x+f
)^(1/2)/(-c^2*x^2+1)^(1/2)+1/4*f*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*f*
x+f)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4763, 4847, 4741, 4737, 30, 4767}

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\frac{f\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}+\frac{f(1-c^2x^2)\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))}{3c}+\frac{1}{2}fx\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))-\frac{bcfx^2\sqrt{cdx+d}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}}-\frac{bfx\sqrt{cdx+d}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}+\frac{bc^2fx^3\sqrt{cdx+d}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}$$

```
[In] Int[Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/3*(b*f*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/Sqrt[1 - c^2*x^2] - (b*c*f*x^2
*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(4*Sqrt[1 - c^2*x^2]) + (b*c^2*f*x^3*Sqrt
[d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) + (f*x*Sqrt[d + c*d*x]*S
qrt[f - c*f*x]*(a + b*ArcSin[c*x]))/2 + (f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*
(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (f*Sqrt[d + c*d*x]*Sqrt[f - c*f*
x]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
```

```
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int (f-cfx)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \left(f\sqrt{1-c^2x^2}(a+b\arcsin(cx))-cfx\sqrt{1-c^2x^2}(a+b\arcsin(cx))\right)\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{\left(f\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}\\
&\quad -\frac{\left(cf\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= \frac{1}{2}fx\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{f\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c} + \frac{\left(f\sqrt{d+cdx}\sqrt{f-cfx}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(bf\sqrt{d+cdx}\sqrt{f-cfx}\right)\int (1-c^2x^2)\,dx}{3\sqrt{1-c^2x^2}} - \frac{\left(bcf\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x\,dx}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bfx\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{bcfx^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} + \frac{bc^2fx^3\sqrt{d+cdx}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}} + \frac{1}{2}fx\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{f\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c} + \frac{f\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 2.17 (sec) , antiderivative size = 260, normalized size of antiderivative = 0.95

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \frac{18bf\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2 - 36a\sqrt{d}f^{3/2}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right) + f\ldots}{}$$

```
[In] Integrate[Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (18*b*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 36*a*Sqrt[d]*f^(3/2
)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*S
qrt[f]*(-1 + c^2*x^2))] + f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(12*a*(2 + 3*c*
x - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] + 8*b*c*x*(-3 + c^2*x^2) + 9*b*Cos[2*ArcSi
n[c*x]]) + 6*b*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(4*(1 - c^2*x^
2)^(3/2) + 3*Sin[2*ArcSin[c*x]]))/(72*c*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int \sqrt{cdx+d}\,(-cfx+f)^{\frac{3}{2}}\,(a+b\arcsin(cx))\,dx$$

```
[In] int((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
[Out] int((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int \sqrt{cdx+d}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
[Out] integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f), x)
```

Sympy [F]

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int \sqrt{d\,(cx+1)}(-f(cx-1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))\,dx$$

```
[In] integrate((c*d*x+d)**(1/2)*(-c*f*x+f)**(3/2)*(a+b*asin(c*x)),x)
[Out] Integral(sqrt(d*(c*x + 1))*(-f*(c*x - 1))**(3/2)*(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int \sqrt{cdx+d}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
[Out] b*sqrt(d)*sqrt(f)*integrate(-(c*f*x - f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/6*(3*sqrt(-c^2*d*f*x^2 + d*f)
*f*x + 3*d*f^2*arcsin(c*x)/(sqrt(d*f)*c) + 2*(-c^2*d*f*x^2 + d*f)^(3/2)/(c*
d))*a
```

Giac [F]

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \int \sqrt{cdx+d}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\sqrt{d+c\,d\,x}\,(f-c\,f\,x)^{3/2}\,dx$$

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(3/2), x)
```

3.513 $\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 242

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = -\frac{2bf^2x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{bcf^2x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{2f^2(1-c^2x^2)\,(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{f^2x(1-c^2x^2)\,(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{3f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{d+cdx}\sqrt{f-cfx}}$$

```
[Out] 2*f^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-1/2
*f^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-2*b*
f^2*x*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/4*b*c*f^2*x^2*(
-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+3/4*f^2*(a+b*arcsin(c*x)
)^2*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 242, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.233, Rules used = {4763, 4847, 4737, 4767, 8, 4795, 30}

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \frac{3f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{cdx+d}\sqrt{f-cfx}} - \frac{f^2x(1-c^2x^2)\,(a+b\arcsin(cx))}{2\sqrt{cdx+d}\sqrt{f-cfx}} + \frac{2f^2(1-c^2x^2)\,(a+b\arcsin(cx))}{c\sqrt{cdx+d}\sqrt{f-cfx}} + \frac{bcf^2x^2\sqrt{1-c^2x^2}}{4\sqrt{cdx+d}\sqrt{f-cfx}} - \frac{2bf^2x\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

```
[In] Int[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] (-2*b*f^2*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (b*c*f^2
*x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (2*f^2*(1 - c
^2*x^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (f^2*x*(
1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*
f^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d + c*d*x]*Sqrt[f
- c*f*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
```

```
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(f-cfx)^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{f^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}-\frac{2cf^2x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{c^2f^2x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&= \frac{\left(f^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{\left(2cf^2\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad+\frac{\left(c^2f^2\sqrt{1-c^2x^2}\right)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&= \frac{2f^2(1-c^2x^2)\,(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{f^2x(1-c^2x^2)\,(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad+\frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{\left(f^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad-\frac{\left(2bf^2\sqrt{1-c^2x^2}\right)\int 1\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{\left(bcf^2\sqrt{1-c^2x^2}\right)\int x\,dx}{2\sqrt{d+cdx}\sqrt{f-cfx}} \\
&= -\frac{2bf^2x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{bcf^2x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{2f^2(1-c^2x^2)\,(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad-\frac{f^2x(1-c^2x^2)\,(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{3f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{d+cdx}\sqrt{f-cfx}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 5.21 (sec) , antiderivative size = 238, normalized size of antiderivative = 0.98

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \frac{-4bf(-4+cx)\sqrt{d+cdx}\sqrt{f-cfx}\sqrt{1-c^2x^2}\arcsin(cx)+6bf\sqrt{d+c}}{}$$

```
[In] Integrate[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] (-4*b*f*(-4 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Sqrt[1 - c^2*x^2]*ArcSin
[c*x] + 6*b*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 12*a*Sqrt[d]*
f^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqr
t[d]*Sqrt[f]*(-1 + c^2*x^2))] - f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(16*b*c*x
 + 4*a*(-4 + c*x)*Sqrt[1 - c^2*x^2] + b*Cos[2*ArcSin[c*x]]))/(8*c*d*Sqrt[1
- c^2*x^2])
```

Maple [F]

$$\int \frac{(-cfx+f)^{\frac{3}{2}}\left(a+b\arcsin\left(cx\right)\right)}{\sqrt{cdx+d}}dx$$

```
[In] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x)
```

```
[Out] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x)
```

Fricas [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin\left(cx\right)+a)}{\sqrt{cdx+d}}\,dx$$

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(-c*f*x + f)/sq
rt(c*d*x + d), x)
```

Sympy [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\int \frac{(-f(cx-1))^{\frac{3}{2}}\,(a+b\operatorname{asin}{(cx)})}{\sqrt{d\,(cx+1)}}\,dx$$

```
[In] integrate((-c*f*x+f)**(3/2)*(a+b*asin(c*x))/(c*d*x+d)**(1/2),x)
[Out] Integral((-f*(c*x - 1))**(3/2)*(a + b*asin(c*x))/sqrt(d*(c*x + 1)), x)
```

Maxima [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin{(cx)}+a)}{\sqrt{cdx+d}}\,dx$$

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
maxima")
[Out] -1/2*(sqrt(-c^2*d*f*x^2 + d*f)*f*x/d - 3*f^2*arcsin(c*x)/(sqrt(d*f)*c) - 4*
sqrt(-c^2*d*f*x^2 + d*f)*f/(c*d))*a - b*sqrt(f)*integrate((c*f*x - f)*sqrt(
-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/sqrt(c*x + 1), x)/sqrt
(d)
```

Giac [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin{(cx)}+a)}{\sqrt{cdx+d}}\,dx$$

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
giac")
[Out] integrate((-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\int \frac{(a+b\operatorname{asin}(c\,x))\,{(f-c\,f\,x)}^{3/2}}{\sqrt{d+c\,d\,x}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(1/2),x)
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(1/2), x)
```

3.514 $\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 252

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \frac{bf^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{4f^3(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^3(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{3f^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{4bf^3(1-c^2x^2)^{3/2}\log(1+cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] b*f^3*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-4*f^3*(-c*x+1)*
(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-f^3*(-c^2
*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-3/2*f^3*(-c^
2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/b/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+4*b
*f^3*(-c^2*x^2+1)^(3/2)*ln(c*x+1)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 252, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4763, 4859, 651, 4845, 12, 641, 31, 4737, 4767, 8}

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = -\frac{3f^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}} - \frac{f^3(1-c^2x^2)^2(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}} - \frac{4f^3(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}} + \frac{bf^3x(1-c^2x^2)^{3/2}}{(cdx+d)^{3/2}(f-cfx)^{3/2}} + \frac{4bf^3(1-c^2x^2)^{3/2}\log(cx+1)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[In] Int[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] (b*f^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (4*f^
3*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f - c*
f*x)^(3/2)) - (f^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2
)*(f - c*f*x)^(3/2)) - (3*f^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(2
*b*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (4*b*f^3*(1 - c^2*x^2)^(3/2)*Lo
g[1 + c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
```

```
e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(1-c^2x^2)^{3/2}\int \frac{(f-cfx)^3(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{(1-c^2x^2)^{3/2}\int \left(\frac{4(f^3-cf^3x)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}-\frac{3f^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{cf^3x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{\left(4(1-c^2x^2)^{3/2}\right)\int \frac{(f^3-cf^3x)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{\left(3f^3(1-c^2x^2)^{3/2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{\left(cf^3(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}$$

$$= -\frac{4f^3(1-cx)(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^3(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{3f^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{\left(4bc(1-c^2x^2)^{3/2}\right)\int \frac{f^3(1-cx)}{c(1-c^2x^2)}dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{\left(bf^3(1-c^2x^2)^{3/2}\right)\int 1dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{bf^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{4f^3(1-cx)(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^3(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{3f^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{\left(4bf^3(1-c^2x^2)^{3/2}\right)\int \frac{1-cx}{1-c^2x^2}dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{bf^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{4f^3(1-cx)(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^3(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{3f^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{\left(4bf^3(1-c^2x^2)^{3/2}\right)\int \frac{1}{1+cx}dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{bf^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{4f^3(1-cx)(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^3(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{3f^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{4bf^3(1-c^2x^2)^{3/2}\log(1+cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

Mathematica [A] (verified)

Time = 6.94 (sec) , antiderivative size = 291, normalized size of antiderivative = 1.15

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}dx = \frac{f\left(6a\sqrt{d}\sqrt{f}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right) - \frac{\sqrt{d+cdx}\sqrt{f-cfx}\csc^2\left(\frac{1}{2}\arcsin(cx)\right)\left(\right.}{}\right.}{}$$

```
[In] Integrate[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] (f*(6*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[
d]*Sqrt[f]*(-1 + c^2*x^2))] - (Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Csc[ArcSin[c
*x]/2]^2*(2*b*(5 + c*x)*(-1 + c*x + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 3*b*(-
```

```
1 - c*x + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*(b*c*x*(-1 - c*x + Sqrt[1 -
c^2*x^2]) + a*(5 + c*x)*(-1 + c*x + Sqrt[1 - c^2*x^2]) + 8*b*(-1 - c*x + Sq
rt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])))/(2*Sqrt[1
- c^2*x^2]*(1 + Cot[ArcSin[c*x]/2])))/(2*c*d^2)
```

Maple [F]

$$\int \frac{(-cfx+f)^{\frac{3}{2}} (a+b \arcsin{(cx)})}{(cdx+d)^{\frac{3}{2}}} dx$$

```
[In] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x)
[Out] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x)
```

Fricas [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin{(cx)}+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
fricas")
[Out] integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f)/(c^2*d^2*x^2 + 2*c*d^2*x + d^2), x)
```

Sympy [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{(-f(cx-1))^{\frac{3}{2}}\,(a+b\operatorname{asin}{(cx)})}{(d\,(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-c*f*x+f)**(3/2)*(a+b*asin(c*x))/(c*d*x+d)**(3/2),x)
[Out] Integral((-f*(c*x - 1))**(3/2)*(a + b*asin(c*x))/(d*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=\int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
maxima")
```

```
[Out] -b*sqrt(d)*sqrt(f)*integrate((c*f*x - f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d^2*x^2 + 2*c*d^2*x + d^2), x) +
 a*((-c^2*d*f*x^2 + d*f)^(3/2)/(c^3*d^3*x^2 + 2*c^2*d^3*x + c*d^3) - 6*sqrt
(-c^2*d*f*x^2 + d*f)*f/(c^2*d^2*x + c*d^2) - 3*f^2*arcsin(c*x)/(c*d^2*sqrt(
f/d)))
```

Giac [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=\int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,{(f-c\,f\,x)}^{3/2}}{{(d+c\,d\,x)}^{3/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(3/2), x)
```

3.515 $\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 324

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = -\frac{4bf^4(1-c^2x^2)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bf^4(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^4(1-cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2f^4(1-cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^4(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{8bf^4(1-c^2x^2)^{5/2}\log(1+cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] -4/3*b*f^4*(-c^2*x^2+1)^(5/2)/c/(c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-1/
2*b*f^4*(-c^2*x^2+1)^(5/2)*arcsin(c*x)^2/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
-2/3*f^4*(-c*x+1)^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*
x+f)^(5/2)+2*f^4*(-c*x+1)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2
)/(-c*f*x+f)^(5/2)+f^4*(-c^2*x^2+1)^(5/2)*arcsin(c*x)*(a+b*arcsin(c*x))/c/(
c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-8/3*b*f^4*(-c^2*x^2+1)^(5/2)*ln(c*x+1)/c/(c
*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 324, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {4763, 683, 667, 222, 4845, 641, 45, 31, 4737}

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \frac{2f^4(1-cx)\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{2f^4(1-cx)^3\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}} + \frac{f^4\left(1-c^2x^2\right)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{bf^4\left(1-c^2x^2\right)^{5/2}\arcsin(cx)^2}{2c(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{4bf^4\left(1-c^2x^2\right)^{5/2}}{3c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{8bf^4\left(1-c^2x^2\right)^{5/2}\log(cx+1)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[In] Int[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] (-4*b*f^4*(1 - c^2*x^2)^(5/2))/(3*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) - (b*f^4*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*
(f - c*f*x)^(5/2)) - (2*f^4*(1 - c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/
(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (2*f^4*(1 - c*x)*(1 - c^2*x^2)^
2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (f^4*(1 -
c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c
*f*x)^(5/2)) - (8*b*f^4*(1 - c^2*x^2)^(5/2)*Log[1 + c*x])/(3*c*(d + c*d*x)^
(5/2)*(f - c*f*x)^(5/2))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
```

```
EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 667

```
Int[((d_) + (e_.)*(x_))^2*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[e*(
d + e*x)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((p + 2)/(c*(p +
1))), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, p}, x] && EqQ[c
*d^2 + a*e^2, 0] &&  !IntegerQ[p] && LtQ[p, -1]
```

Rule 683

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((m +
p)/(c*(p + 1))), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int\frac{(f-cfx)^4(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^4(1-cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2f^4(1-cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^4(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc(1-c^2x^2)^{5/2}\right)\int\left(-\frac{2f^4(1-cx)^3}{3c(1-c^2x^2)^2}+\frac{2f^4(1-cx)}{c(1-c^2x^2)}+\frac{f^4\arcsin(cx)}{c\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^4(1-cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2f^4(1-cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^4(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(2bf^4(1-c^2x^2)^{5/2}\right)\int\frac{(1-cx)^3}{(1-c^2x^2)^2}dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bf^4(1-c^2x^2)^{5/2}\right)\int\frac{\arcsin(cx)}{\sqrt{1-c^2x^2}}dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(2bf^4(1-c^2x^2)^{5/2}\right)\int\frac{1-cx}{1-c^2x^2}dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bf^4(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^4(1-cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2f^4(1-cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^4(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(2bf^4(1-c^2x^2)^{5/2}\right)\int\frac{1-cx}{(1+cx)^2}dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(2bf^4(1-c^2x^2)^{5/2}\right)\int\frac{1}{1+cx}dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bf^4(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^4(1-cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2f^4(1-cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^4(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2bf^4(1-c^2x^2)^{5/2}\log(1+cx)}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(2bf^4(1-c^2x^2)^{5/2}\right)\int\left(\frac{1}{-1-cx}+\frac{2}{(1+cx)^2}\right)dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{4bf^4(1-c^2x^2)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bf^4(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^4(1-cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2f^4(1-cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^4(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{8bf^4(1-c^2x^2)^{5/2}\log(1+cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

Mathematica [A] (verified)

Time = 8.14 (sec) , antiderivative size = 599, normalized size of antiderivative = 1.85

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \frac{f\left(\frac{16a(1+2cx)\sqrt{d+cdx}\sqrt{f-cfx}}{(1+cx)^2} - 12a\sqrt{d}\sqrt{f}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right) - \frac{b\sqrt{d}}{}\right.}{}$$

```
[In] Integrate[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]

[Out] (f*((16*a*(1 + 2*c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(1 + c*x)^2 - 12*a*S
qrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f
]*(-1 + c^2*x^2))] - (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]
 - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2]*(-8 + 6*ArcSin[c*x] + 9*ArcSin[c
*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*
x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[ArcSin[c*x]/2] + Sin[
ArcSin[c*x]/2]]) + 2*(-4 + 2*(2 + 7*Sqrt[1 - c^2*x^2])*ArcSin[c*x] + 3*(2 +
 Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 - 28*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/((-1 + c*x)*(Cos[Arc
Sin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[
c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Cos[ArcSin[c*x]/2]
*(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(
-2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 2*(2 + Sqrt[1 - c^2*x^2])*Log[Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/((-1 + c*x)*(C
os[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4)))/(12*c*d^3)
```

Maple [F]

$$\int \frac{(-cfx+f)^{\frac{3}{2}} (a+b\arcsin(cx))}{(cdx+d)^{\frac{5}{2}}}dx$$

```
[In] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x)
[Out] int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x)
```

Fricas [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
fricas")
[Out] integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f)/(c^3*d^3*x^3 + 3*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \int \frac{(-f(cx-1))^{\frac{3}{2}} (a+b\operatorname{asin}(cx))}{(d(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((-c*f*x+f)**(3/2)*(a+b*asin(c*x))/(c*d*x+d)**(5/2),x)
[Out] Integral((-f*(c*x - 1))**(3/2)*(a + b*asin(c*x))/(d*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
maxima")
[Out] -b*sqrt(d)*sqrt(f)*integrate((c*f*x - f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^3*d^3*x^3 + 3*c^2*d^3*x^2 + 3*c*d^
3*x + d^3), x) - 1/3*a*((-c^2*d*f*x^2 + d*f)^(3/2)/(c^4*d^4*x^3 + 3*c^3*d^4
*x^2 + 3*c^2*d^4*x + c*d^4) + 2*sqrt(-c^2*d*f*x^2 + d*f)*f/(c^3*d^3*x^2 + 2
*c^2*d^3*x + c*d^3) - 7*sqrt(-c^2*d*f*x^2 + d*f)*f/(c^2*d^3*x + c*d^3) - 3*
f^2*arcsin(c*x)/(c*d^3*sqrt(f/d)))
```

Giac [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
giac")
[Out] integrate((-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(f-c\,f\,x\right)^{3/2}}{\left(d+c\,d\,x\right)^{5/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(5/2),x)
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(5/2), x)
```

3.516 $\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 315

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = -\frac{25bcx^2(d+cdx)^{5/2}(f-cfx)^{5/2}}{96\,(1-c^2x^2)^{5/2}} + \frac{5bc^3x^4(d+cdx)^{5/2}(f-cfx)^{5/2}}{96\,(1-c^2x^2)^{5/2}} + \frac{b(d+cdx)^{5/2}(f-cfx)^{5/2}\sqrt{1-c^2x^2}}{36c} + \frac{1}{6}x(d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx)) + \frac{5x(d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))}{16\,(1-c^2x^2)^2} + \frac{5x(d+cdx)^{5}\cdots}{}$$

```
[Out] -25/96*b*c*x^2*(c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)/(-c^2*x^2+1)^(5/2)+5/96*b*c
^3*x^4*(c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)/(-c^2*x^2+1)^(5/2)+1/6*x*(c*d*x+d)^
(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))+5/16*x*(c*d*x+d)^(5/2)*(-c*f*x+f)^
(5/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^2+5/24*x*(c*d*x+d)^(5/2)*(-c*f*x+f)^(5
/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)+5/32*(c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a
+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(5/2)+1/36*b*(c*d*x+d)^(5/2)*(-c*f*x+f)^
(5/2)*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 315, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.233, Rules used

$= \{4763, 4743, 4741, 4737, 30, 14, 267\}$

$$\int (d + cdx)^{5/2}(f - cfx)^{5/2}(a + b \arcsin(cx))\, dx = \frac{5x(cdx+d)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))}{24\,(1-c^2x^2)} + \frac{5x(cdx+d)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))}{16\,(1-c^2x^2)^2} + \frac{5(cdx+d)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))^2}{32bc\,(1-c^2x^2)^{5/2}} + \frac{1}{6}x(cdx+d)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx)) - \frac{25bcx^2(cdx+d)^{5/2}(f-cfx)^{5/2}}{96\,(1-c^2x^2)^{5/2}} + \frac{b\sqrt{1-c^2x^2}(cdx+d)^{5/2}(f-}{36c}$$

```
[In] Int[(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-25*b*c*x^2*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))/(96*(1 - c^2*x^2)^(5/2))
+ (5*b*c^3*x^4*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))/(96*(1 - c^2*x^2)^(5/2)
) + (b*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*Sqrt[1 - c^2*x^2])/(36*c) + (x*(
d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/6 + (5*x*(d + c*d*x
)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(16*(1 - c^2*x^2)^2) + (5*x*
(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(24*(1 - c^2*x^2))
 + (5*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(32*b*c*(1
 - c^2*x^2)^(5/2))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\text{integral} = \frac{\left((d+cdx)^{5/2}(f-cfx)^{5/2}\right)\int\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\,dx}{\left(1-c^2x^2\right)^{5/2}}$$

$$= \frac{1}{6}x(d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx)) + \frac{\left(5(d+cdx)^{5/2}(f-cfx)^{5/2}\right)\int\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx}{6\left(1-c^2x^2\right)^{5/2}} - \frac{\left(bc(d+cdx)^{5/2}(f-cfx)^{5/2}\right)\int x\left(1-c^2x^2\right)^2\,dx}{6\left(1-c^2x^2\right)^{5/2}}$$

$$= \frac{b(d+cdx)^{5/2}(f-cfx)^{5/2}\sqrt{1-c^2x^2}}{36c} + \frac{1}{6}x(d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx)) + \frac{5x(d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))}{24\left(1-c^2x^2\right)} + \frac{(5

$$= \frac{b(d+cdx)^{5/2}(f-cfx)^{5/2}\sqrt{1-c^2x^2}}{36c} + \frac{1}{6}x(d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx)) + \frac{5x(d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))}{16\left(1-c^2x^2\right)^2} + \frac{5x(}{}$$

$$= -\frac{25bcx^2(d+cdx)^{5/2}(f-cfx)^{5/2}}{96\left(1-c^2x^2\right)^{5/2}} + \frac{5bc^3x^4(d+cdx)^{5/2}(f-cfx)^{5/2}}{96\left(1-c^2x^2\right)^{5/2}} + \frac{b(d+cdx)^{5/2}(f-cfx)^{5/2}\sqrt{1-c^2x^2}}{36c} + \frac{1}{6}x(d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx)) + \frac{5x(d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))}{16\left(1-c^2x^2\right)^2} + \frac{5x(}{}$$

Mathematica [A] (verified)

Time = 3.06 (sec) , antiderivative size = 303, normalized size of antiderivative = 0.96

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \frac{d^2f^2\left(360b\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2 - 720a\sqrt{d}\sqrt{f}\sqrt{1-c^2x^2}\arctan\left(\frac{c}{}\right.\right.}{}$$

```
[In] Integrate[(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*f^2*(360*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 720*a*Sqrt[
d]*Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(
Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(1584*a*
c*x*Sqrt[1 - c^2*x^2] - 1248*a*c^3*x^3*Sqrt[1 - c^2*x^2] + 384*a*c^5*x^5*Sq
rt[1 - c^2*x^2] + 270*b*Cos[2*ArcSin[c*x]] + 27*b*Cos[4*ArcSin[c*x]] + 2*b*
Cos[6*ArcSin[c*x]]) + 12*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(45*
Sin[2*ArcSin[c*x]] + 9*Sin[4*ArcSin[c*x]] + Sin[6*ArcSin[c*x]])))/(2304*c*S
qrt[1 - c^2*x^2])
```

Maple [F]

$$\int (cdx+d)^{\frac{5}{2}}\left(-cfx+f\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)dx$$

```
[In] int((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral((a*c^4*d^2*f^2*x^4 - 2*a*c^2*d^2*f^2*x^2 + a*d^2*f^2 + (b*c^4*d^2*
f^2*x^4 - 2*b*c^2*d^2*f^2*x^2 + b*d^2*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\text{Timed out}$$

```
[In] integrate((c*d*x+d)**(5/2)*(-c*f*x+f)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
```

```
[Out] b*sqrt(d)*sqrt(f)*integrate((c^4*d^2*f^2*x^4 - 2*c^2*d^2*f^2*x^2 + d^2*f^2)
*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x
) + 1/48*(15*sqrt(-c^2*d*f*x^2 + d*f)*d^2*f^2*x + 15*d^3*f^3*arcsin(c*x)/(s
qrt(d*f)*c) + 10*(-c^2*d*f*x^2 + d*f)^(3/2)*d*f*x + 8*(-c^2*d*f*x^2 + d*f)^
(5/2)*x)*a
```

Giac [F]

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\int (a+b\,\mathrm{asin}(c\,x))\,(d+c\,d\,x)^{5/2}\,(f-c\,f\,x)^{5/2}\,dx$$

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2), x)
```

3.517 $\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 414

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = -\frac{bfx(d+cdx)^{3/2}(f-cfx)^{3/2}}{5(1-c^2x^2)^{3/2}} - \frac{5bcfx^2(d+cdx)^{3/2}(f-cfx)^{3/2}}{16(1-c^2x^2)^{3/2}} + \frac{2bc^2fx^3(d+cdx)^{3/2}(f-cfx)^{3/2}}{15(1-c^2x^2)^{3/2}} + \frac{bc^3fx^4(d+cdx)^{3/2}(f-cfx)^{3/2}}{16(1-c^2x^2)^{3/2}} - \frac{bc^4fx^5(d+cdx)^{3/2}(f-cfx)^{3/2}}{25(1-c^2x^2)^{3/2}} + \frac{1}{4}fx(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx)) + \frac{3fx(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))}{8(1-c^2x^2)} + \frac{f(d+cdx)}{}$$

```
[Out] -1/5*b*f*x*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)-5/16*b*c*f*x
^2*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+2/15*b*c^2*f*x^3*(c*
d*x+d)^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+1/16*b*c^3*f*x^4*(c*d*x+d)
^(3/2)*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)-1/25*b*c^4*f*x^5*(c*d*x+d)^(3/2)
*(-c*f*x+f)^(3/2)/(-c^2*x^2+1)^(3/2)+1/4*f*x*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/
2)*(a+b*arcsin(c*x))+3/8*f*x*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c
*x))/(-c^2*x^2+1)+1/5*f*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(-c^2*x^2+1)*(a+b*
arcsin(c*x))/c+3/16*f*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))^2/
b/c/(-c^2*x^2+1)^(3/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 414, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {4763, 4847, 4743, 4741, 4737, 30, 14, 4767, 200}

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\frac{3fx(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))}{8(1-c^2x^2)}$$
$$+\frac{3f(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))^2}{16bc(1-c^2x^2)^{3/2}}$$
$$+\frac{f(1-c^2x^2)(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))}{5c}$$
$$+\frac{1}{4}fx(cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))-\frac{5bcfx^2(cdx+d)^{3/2}(f-cfx)^{3/2}}{16(1-c^2x^2)^{3/2}}-\frac{bfx(cdx+d)^{3/2}(f-cfx)^{3}}{5(1-c^2x^2)^{3/2}}$$

```
[In] Int[(d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/5*(b*f*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(1 - c^2*x^2)^(3/2) - (5*b
*c*f*x^2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)) + (2
*b*c^2*f*x^3*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(15*(1 - c^2*x^2)^(3/2))
+ (b*c^3*f*x^4*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(16*(1 - c^2*x^2)^(3/2)
) - (b*c^4*f*x^5*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))/(25*(1 - c^2*x^2)^(3/
2)) + (f*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*
f*x*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^
2)) + (f*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*
x]))/(5*c) + (3*f*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x])^2
)/(16*b*c*(1 - c^2*x^2)^(3/2))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
```

```
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\text{integral} = \frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int (f-cfx)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left((d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \left(f(1-c^2x^2)^{3/2}(a+b\arcsin(cx))-cfx(1-c^2x^2)^{3/2}(a+b\arcsin(cx\right.}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left(f(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\,dx}{\left(1-c^2x^2\right)^{3/2}} - \frac{\left(cf(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\,dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}fx(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx)) + \frac{f(d+cdx)^{3/2}(f-cfx)^{3/2}\left(1-c^2x^2\right)(a+b\arcsin(cx))}{5c} + \frac{\left(3f(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{4\left(1-c^2x^2\right)^{3/2}} - \frac{\left(bf(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \left(1-c^2x^2\right)^2\,dx}{5\left(1-c^2x^2\right)^{3/2}} - \frac{\left(bcf(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int x\left(1-c^2x^2\right)\,dx}{4\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}fx(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx)) + \frac{3fx(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))}{8\left(1-c^2x^2\right)} + \frac{f(d+cdx)^{3/2}(f-cfx)^{3/2}\left(1-c^2x^2\right)(a+b\arcsin(cx))}{5c} + \frac{\left(3f(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{8\left(1-c^2x^2\right)^{3/2}} - \frac{\left(bf(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \left(1-2c^2x^2+c^4x^4\right)\,dx}{5\left(1-c^2x^2\right)^{3/2}} - \frac{\left(bcf(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int \left(x-c^2x^3\right)\,dx}{4\left(1-c^2x^2\right)^{3/2}} - \frac{\left(3bcf(d+cdx)^{3/2}(f-cfx)^{3/2}\right)\int x\,dx}{8\left(1-c^2x^2\right)^{3/2}}$$

$$= -\frac{bfx(d+cdx)^{3/2}(f-cfx)^{3/2}}{5(1-c^2x^2)^{3/2}} - \frac{5bcfx^2(d+cdx)^{3/2}(f-cfx)^{3/2}}{16(1-c^2x^2)^{3/2}} + \frac{2bc^2fx^3(d+cdx)^{3/2}(f-cfx)^{3/2}}{15(1-c^2x^2)^{3/2}} + \frac{bc^3fx^4(d+cdx)^{3/2}(f-cfx)^{3/2}}{16(1-c^2x^2)^{3/2}} - \frac{bc^4fx^5(d+cdx)^{3/2}(f-cfx)^{3/2}}{25(1-c^2x^2)^{3/2}} + \frac{1}{4}fx(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx)) + \frac{3fx(d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))}{8(1-c^2x^2)} +$$

Mathematica [A] (verified)

Time = 2.64 (sec) , antiderivative size = 305, normalized size of antiderivative = 0.74

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \frac{df^2\Big(1800b\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2 - 3600a\sqrt{d}\sqrt{f}\sqrt{1-c^2x^2}\arctan$$

```
[In] Integrate[(d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
[Out] (d*f^2*(1800*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 3600*a*Sqrt[
d]*Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(
Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-128*b*
c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 240*a*Sqrt[1 - c^2*x^2]*(8 + 25*c*x - 1
6*c^2*x^2 - 10*c^3*x^3 + 8*c^4*x^4) + 1200*b*Cos[2*ArcSin[c*x]] + 75*b*Cos[
4*ArcSin[c*x]]) + 60*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(32*(1 -
 c^2*x^2)^(5/2) + 40*Sin[2*ArcSin[c*x]] + 5*Sin[4*ArcSin[c*x]])))/(9600*c*S
qrt[1 - c^2*x^2])
```

Maple [F]

$$\int (cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}(a+b\arcsin(cx))\,dx$$

```
[In] int((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
[Out] int((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
```

```
[Out] integral((a*c^3*d*f^2*x^3 - a*c^2*d*f^2*x^2 - a*c*d*f^2*x + a*d*f^2 + (b*c^
3*d*f^2*x^3 - b*c^2*d*f^2*x^2 - b*c*d*f^2*x + b*d*f^2)*arcsin(c*x))*sqrt(c*
d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(3/2)*(-c*f*x+f)**(5/2)*(a+b*asin(c*x)),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
```

```
[Out] b*sqrt(d)*sqrt(f)*integrate((c^3*d*f^2*x^3 - c^2*d*f^2*x^2 - c*d*f^2*x + d*
f^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
), x) + 1/40*(15*sqrt(-c^2*d*f*x^2 + d*f)*d*f^2*x + 15*d^2*f^3*arcsin(c*x)/
(sqrt(d*f)*c) + 10*(-c^2*d*f*x^2 + d*f)^(3/2)*f*x + 8*(-c^2*d*f*x^2 + d*f)^
(5/2)/(c*d))*a
```

Giac [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
[Out] integrate((c*d*x + d)^(3/2)*(-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,(d+c\,d\,x)^{3/2}\,(f-c\,f\,x)^{5/2}\,dx$$

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(5/2),x)
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(5/2), x)
```

3.518 $\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 376

$$\begin{aligned}\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx &= -\frac{2bf^2x\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} \\ &- \frac{3bcf^2x^2\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}} + \frac{2bc^2f^2x^3\sqrt{d+cdx}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}} \\ &- \frac{bc^3f^2x^4\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}} + \frac{3}{8}f^2x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) \\ &+ \frac{1}{4}c^2f^2x^3\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) \\ &+ \frac{2f^2\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c} \\ &+ \frac{5f^2\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] 3/8*f^2*x*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)+1/4*c^2*f^2*x^
3*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)+2/3*f^2*(-c^2*x^2+1)*(
a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/c-2/3*b*f^2*x*(c*d*x+d)^(
1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-3/16*b*c*f^2*x^2*(c*d*x+d)^(1/2)*(
-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+2/9*b*c^2*f^2*x^3*(c*d*x+d)^(1/2)*(-c*f*
x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/16*b*c^3*f^2*x^4*(c*d*x+d)^(1/2)*(-c*f*x+f)
^(1/2)/(-c^2*x^2+1)^(1/2)+5/16*f^2*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*
f*x+f)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 376, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4763, 4847, 4741, 4737, 30, 4767, 4783, 4795}

$$\begin{aligned}&\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\frac{1}{4}c^2f^2x^3\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))\\&+\frac{5f^2\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}\\&+\frac{2f^2(1-c^2x^2)\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))}{3c}\\&+\frac{3}{8}f^2x\sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))\\&-\frac{3bcf^2x^2\sqrt{cdx+d}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}-\frac{2bf^2x\sqrt{cdx+d}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}\\&+\frac{2bc^2f^2x^3\sqrt{cdx+d}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}-\frac{bc^3f^2x^4\sqrt{cdx+d}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}\end{aligned}$$

```
[In] Int[Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (-2*b*f^2*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(3*Sqrt[1 - c^2*x^2]) - (3*b*c
*f^2*x^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) + (2*b*c^2
*f^2*x^3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*f^
2*x^4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(16*Sqrt[1 - c^2*x^2]) + (3*f^2*x*Sq
rt[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/8 + (c^2*f^2*x^3*Sqrt[d
+ c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/4 + (2*f^2*Sqrt[d + c*d*x]*Sq
rt[f - c*f*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c) + (5*f^2*Sqrt[d + c*
d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x])^2)/(16*b*c*Sqrt[1 - c^2*x^2])
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\text{integral} = \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int(f-cfx)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\sqrt{f-cfx}\right)\int\left(f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))-2cf^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))+c^2\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(f^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(2cf^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(c^2f^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}f^2x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{1}{4}c^2f^2x^3\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{2f^2\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c} + \frac{\left(f^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(2bf^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int\left(1-c^2x^2\right)\,dx}{3\sqrt{1-c^2x^2}} - \frac{\left(bcf^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x\,dx}{2\sqrt{1-c^2x^2}} + \frac{\left(c^2f^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(bc^3f^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x^3\,dx}{4\sqrt{1-c^2x^2}}$$

$$= -\frac{2bf^2x\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{bcf^2x^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} + \frac{2bc^2f^2x^3\sqrt{d+cdx}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}} - \frac{bc^3f^2x^4\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}} + \frac{3}{8}f^2x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{1}{4}c^2f^2x^3\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{2f^2\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c} + \frac{f^2\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}} + \frac{\left(f^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} + \frac{\left(bcf^2\sqrt{d+cdx}\sqrt{f-cfx}\right)\int x\,dx}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{2bf^2x\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{3bcf^2x^2\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}} + \frac{2bc^2f^2x^3\sqrt{d+cdx}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}} - \frac{bc^3f^2x^4\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}} + \frac{3}{8}f^2x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{1}{4}c^2f^2x^3\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{2f^2\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c} + \frac{5f^2\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 2.32 (sec) , antiderivative size = 293, normalized size of antiderivative = 0.78

$$\int\sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \frac{360bf^2\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2 - 720a\sqrt{d}f^{5/2}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right)}{}$$

```
[In] Integrate[Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (360*b*f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 720*a*Sqrt[d]*f^
(5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[
d]*Sqrt[f]*(-1 + c^2*x^2))] + f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(256*b*c*
x*(-3 + c^2*x^2) + 48*a*Sqrt[1 - c^2*x^2]*(16 + 9*c*x - 16*c^2*x^2 + 6*c^3*
```

```
x^3) + 144*b*Cos[2*ArcSin[c*x]] - 9*b*Cos[4*ArcSin[c*x]]) - 12*b*f^2*Sqrt[d
 + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(-64*(1 - c^2*x^2)^(3/2) - 24*Sin[2*A
rcSin[c*x]] + 3*Sin[4*ArcSin[c*x]]))/(1152*c*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int \sqrt{cdx+d}\,(-cfx+f)^{\frac{5}{2}}\,(a+b\arcsin\,(cx))\,dx$$

```
[In] int((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
[Out] int((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int \sqrt{cdx+d}(-cfx+f)^{\frac{5}{2}}(b\arcsin\,(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
fricas")
[Out] integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2*
x + b*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(1/2)*(-c*f*x+f)**(5/2)*(a+b*asin(c*x)),x)
[Out] Timed out
```

Maxima [F]

$$\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int \sqrt{cdx+d}(-cfx+f)^{\frac{5}{2}}(b\arcsin\,(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
maxima")
[Out] b*sqrt(d)*sqrt(f)*integrate((c^2*f^2*x^2 - 2*c*f^2*x + f^2)*sqrt(c*x + 1)*s
qrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/24*(15*sqr
t(-c^2*d*f*x^2 + d*f)*f^2*x + 15*d*f^3*arcsin(c*x)/(sqrt(d*f)*c) - 6*(-c^2*
d*f*x^2 + d*f)^(3/2)*f*x/d + 16*(-c^2*d*f*x^2 + d*f)^(3/2)*f/(c*d))*a
```

Giac [F]

$$\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int \sqrt{cdx+d}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\sqrt{d+c\,d\,x}\,(f-c\,f\,x)^{5/2}\,dx$$

```
[In] int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(5/2), x)
```

3.519 $\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 345

$$\begin{aligned}
\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx &= -\frac{11bf^3x\sqrt{1-c^2x^2}}{3\sqrt{d+cdx}\sqrt{f-cfx}} \\
&+ \frac{3bcf^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{bc^2f^3x^3\sqrt{1-c^2x^2}}{9\sqrt{d+cdx}\sqrt{f-cfx}} \\
&+ \frac{11f^3(1-c^2x^2)\,(a+b\arcsin(cx))}{3c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{3f^3x(1-c^2x^2)\,(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}} \\
&+ \frac{cf^3x^2(1-c^2x^2)\,(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{5f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{d+cdx}\sqrt{f-cfx}}
\end{aligned}$$

```
[Out] 11/3*f^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-
3/2*f^3*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1
/3*c*f^3*x^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2
)-11/3*b*f^3*x*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+3/4*b*c*
f^3*x^2*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-1/9*b*c^2*f^3*x
^3*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+5/4*f^3*(a+b*arcsin(
c*x))^2*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 345, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.233, Rules used = {4763, 4847, 4737, 4767, 8, 4795, 30}

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \frac{5f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{cdx+d}\sqrt{f-cfx}} + \frac{cf^3x^2(1-c^2x^2)\,(a+b\arcsin(cx))}{3\sqrt{cdx+d}\sqrt{f-cfx}} - \frac{3f^3x(1-c^2x^2)\,(a+b\arcsin(cx))}{2\sqrt{cdx+d}\sqrt{f-cfx}} + \frac{11f^3(1-c^2x^2)\,(a+b\arcsin(cx))}{3c\sqrt{cdx+d}\sqrt{f-cfx}} + \frac{3bcf^3x^2\sqrt{1-c^2x^2}}{4\sqrt{cdx+d}\sqrt{f-cfx}} - \frac{11bf^3x\sqrt{1-c^2x^2}}{3\sqrt{cdx+d}\sqrt{f-cfx}} - \frac{bc^2f^3x^3\sqrt{1-c^2x^2}}{9\sqrt{cdx+d}\sqrt{f-cfx}}$$

```
[In] Int[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] (-11*b*f^3*x*Sqrt[1 - c^2*x^2])/(3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*b*
c*f^3*x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (b*c^2*f
^3*x^3*Sqrt[1 - c^2*x^2])/(9*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (11*f^3*(1
- c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (3*
f^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
) + (c*f^3*x^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[f
 - c*f*x]) + (5*f^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d
+ c*d*x]*Sqrt[f - c*f*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
```

```
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int\frac{(f-cfx)^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&= \frac{\sqrt{1-c^2x^2}\int\left(\frac{f^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}-\frac{3cf^3x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{3c^2f^3x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}-\frac{c^3f^3x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&= \frac{\left(f^3\sqrt{1-c^2x^2}\right)\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{\left(3cf^3\sqrt{1-c^2x^2}\right)\int\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad+\frac{\left(3c^2f^3\sqrt{1-c^2x^2}\right)\int\frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{\left(c^3f^3\sqrt{1-c^2x^2}\right)\int\frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}
\end{aligned}
$$

$$= \frac{3f^3(1-c^2x^2)(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{3f^3x(1-c^2x^2)(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{cf^3x^2(1-c^2x^2)(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{\left(3f^3\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{\left(3bf^3\sqrt{1-c^2x^2}\right)\int 1\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{\left(2cf^3\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{\left(3bcf^3\sqrt{1-c^2x^2}\right)\int x\,dx}{2\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{\left(bc^2f^3\sqrt{1-c^2x^2}\right)\int x^2\,dx}{3\sqrt{d+cdx}\sqrt{f-cfx}}$$

$$= -\frac{3bf^3x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{3bcf^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{bc^2f^3x^3\sqrt{1-c^2x^2}}{9\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{11f^3(1-c^2x^2)(a+b\arcsin(cx))}{3c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{3f^3x(1-c^2x^2)(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{cf^3x^2(1-c^2x^2)(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{5f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{\left(2bf^3\sqrt{1-c^2x^2}\right)\int 1\,dx}{3\sqrt{d+cdx}\sqrt{f-cfx}}$$

$$= -\frac{11bf^3x\sqrt{1-c^2x^2}}{3\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{3bcf^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{bc^2f^3x^3\sqrt{1-c^2x^2}}{9\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{11f^3(1-c^2x^2)(a+b\arcsin(cx))}{3c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{3f^3x(1-c^2x^2)(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{cf^3x^2(1-c^2x^2)(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{5f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{d+cdx}\sqrt{f-cfx}}$$

Mathematica [A] (verified)

Time = 6.20 (sec) , antiderivative size = 274, normalized size of antiderivative = 0.79

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \frac{90bf^2\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2 - 180a\sqrt{d}f^{5/2}\sqrt{1-c^2x^2}\arctan$$

```
[In] Integrate[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

```
[Out] (90*b*f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 180*a*Sqrt[d]*f^(
5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d
]*Sqrt[f]*(-1 + c^2*x^2))] - 6*b*f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin
[c*x]*(9*(-5 + 2*c*x)*Sqrt[1 - c^2*x^2] + Cos[3*ArcSin[c*x]]) + f^2*Sqrt[d
+ c*d*x]*Sqrt[f - c*f*x]*(-270*b*c*x + 12*a*Sqrt[1 - c^2*x^2]*(22 - 9*c*x +
 2*c^2*x^2) - 27*b*Cos[2*ArcSin[c*x]] + 2*b*Sin[3*ArcSin[c*x]]))/(72*c*d*Sq
rt[1 - c^2*x^2])
```

Maple [F]

$$\int \frac{(-cfx+f)^{\frac{5}{2}}(a+b\arcsin(cx))}{\sqrt{cdx+d}}dx$$

```
[In] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x)
[Out] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x)
```

Fricas [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)}{\sqrt{cdx+d}}\,dx$$

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
fricas")
[Out] integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2*
x + b*f^2)*arcsin(c*x))*sqrt(-c*f*x + f)/sqrt(c*d*x + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \text{Timed out}$$

```
[In] integrate((-c*f*x+f)**(5/2)*(a+b*asin(c*x))/(c*d*x+d)**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)}{\sqrt{cdx+d}}\,dx$$

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
maxima")
[Out] 1/6*(2*sqrt(-c^2*d*f*x^2 + d*f)*c*f^2*x^2/d - 9*sqrt(-c^2*d*f*x^2 + d*f)*f^
2*x/d + 15*f^3*arcsin(c*x)/(sqrt(d*f)*c) + 22*sqrt(-c^2*d*f*x^2 + d*f)*f^2/
(c*d))*a + b*sqrt(f)*integrate((c^2*f^2*x^2 - 2*c*f^2*x + f^2)*sqrt(-c*x +
1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/sqrt(c*x + 1), x)/sqrt(d)
```

Giac [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin{(cx)}+a)}{\sqrt{cdx+d}}\,dx$$

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,{(f-c\,f\,x)}^{5/2}}{\sqrt{d+c\,d\,x}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(1/2), x)
```

3.520 $\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 465

$$\begin{aligned}\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx &= \frac{3bf^4x(1-c^2x^2)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} \\ &+ \frac{bcf^4x^2(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bf^4(1-cx)^2(1-c^2x^2)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\ &+ \frac{15bf^4(1-c^2x^2)^{3/2}\arcsin(cx)^2}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{2f^4(1-cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\ &- \frac{15f^4(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5f^4(1-cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\ &- \frac{15f^4(1-c^2x^2)^{3/2}\arcsin(cx)(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{8bf^4(1-c^2x^2)^{3/2}\log(1+cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}\end{aligned}$$

```
[Out] 3/2*b*f^4*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+b*c*f^4*x^2
*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-5/4*b*f^4*(-c*x+1)^2*(
-c^2*x^2+1)^(3/2)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+15/4*b*f^4*(-c^2*x^2+1
)^(3/2)*arcsin(c*x)^2/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-2*f^4*(-c*x+1)^3*(
-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-15/2*f^4*(
-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-5/2*f^4*
(-c*x+1)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2
)-15/2*f^4*(-c^2*x^2+1)^(3/2)*arcsin(c*x)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/
2)/(-c*f*x+f)^(3/2)+8*b*f^4*(-c^2*x^2+1)^(3/2)*ln(c*x+1)/c/(c*d*x+d)^(3/2)/
(-c*f*x+f)^(3/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 465, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {4763, 683, 685, 655, 222, 4845, 641, 45, 4737}

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=-\frac{5f^4(1-cx)\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{15f^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{2f^4(1-cx)^3\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{15f^4\left(1-c^2x^2\right)^{3/2}\arcsin(cx)(a+b\arcsin(cx))}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{15bf^4\left(1-c^2x^2\right)^{3/2}\arcsin(cx)^2}{4c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{bcf^4x^2\left(1-c^2x^2\right)^{3/2}}{(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{5bf^4(1-cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{3bf^4x\left(1-c^2x^2\right)^{3/2}}{2(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{8bf^4\left(1-c^2x^2\right)^{3/2}\log(cx+1)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[In] Int[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] (3*b*f^4*x*(1 - c^2*x^2)^(3/2))/(2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (
b*c*f^4*x^2*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (5
*b*f^4*(1 - c*x)^2*(1 - c^2*x^2)^(3/2))/(4*c*(d + c*d*x)^(3/2)*(f - c*f*x)^
(3/2)) + (15*b*f^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2)/(4*c*(d + c*d*x)^(3/2
)*(f - c*f*x)^(3/2)) - (2*f^4*(1 - c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])
)/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (15*f^4*(1 - c^2*x^2)^2*(a + b*
ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (5*f^4*(1 - c*x)*
(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/
2)) - (15*f^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(2*c*(d
+ c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (8*b*f^4*(1 - c^2*x^2)^(3/2)*Log[1 + c*
x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 655

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[e*((
a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 683

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((m +
p)/(c*(p + 1))), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 685

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 1))), x] + Dist[2*c*
d*((m + p)/(c*(m + 2*p + 1))), Int[(d + e*x)^(m - 1)*(a + c*x^2)^p, x], x]
/; FreeQ[{a, c, d, e, p}, x] && EqQ[c*d^2 + a*e^2, 0] && GtQ[m, 1] && NeQ[m
 + 2*p + 1, 0] && IntegerQ[2*p]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
```

```
x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{3/2}\int\frac{(f-cfx)^4(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= -\frac{2f^4(1-cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{15f^4(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5f^4(1-cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{15f^4(1-c^2x^2)^{3/2}\arcsin(cx)(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(bc(1-c^2x^2)^{3/2}\right)\int\left(-\frac{15f^4}{2c}-\frac{5f^4(1-cx)}{2c}-\frac{2f^4(1-cx)^3}{c(1-c^2x^2)}-\frac{15f^4\arcsin(cx)}{2c\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{15bf^4x(1-c^2x^2)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bf^4(1-cx)^2(1-c^2x^2)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{2f^4(1-cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{15f^4(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5f^4(1-cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{15f^4(1-c^2x^2)^{3/2}\arcsin(cx)(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{\left(2bf^4(1-c^2x^2)^{3/2}\right)\int\frac{(1-cx)^3}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{\left(15bf^4(1-c^2x^2)^{3/2}\right)\int\frac{\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{15bf^4x(1-c^2x^2)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bf^4(1-cx)^2(1-c^2x^2)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{15bf^4(1-c^2x^2)^{3/2}\arcsin(cx)^2}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{2f^4(1-cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{15f^4(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5f^4(1-cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{15f^4(1-c^2x^2)^{3/2}\arcsin(cx)(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{\left(2bf^4(1-c^2x^2)^{3/2}\right)\int\frac{(1-cx)^2}{1+cx}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$
\begin{aligned}
&= \frac{15bf^4x(1-c^2x^2)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bf^4(1-cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad + \frac{15bf^4(1-c^2x^2)^{3/2}\arcsin(cx)^2}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{2f^4(1-cx)^3\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad - \frac{15f^4(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5f^4(1-cx)\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad - \frac{15f^4(1-c^2x^2)^{3/2}\arcsin(cx)(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad + \frac{\left(2bf^4(1-c^2x^2)^{3/2}\right)\int\left(-3+cx+\frac{4}{1+cx}\right)dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{3bf^4x(1-c^2x^2)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{bcf^4x^2(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bf^4(1-cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad + \frac{15bf^4(1-c^2x^2)^{3/2}\arcsin(cx)^2}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{2f^4(1-cx)^3\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad - \frac{15f^4(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5f^4(1-cx)\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad - \frac{15f^4(1-c^2x^2)^{3/2}\arcsin(cx)(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{8bf^4(1-c^2x^2)^{3/2}\log(1+cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 7.79 (sec) , antiderivative size = 685, normalized size of antiderivative = 1.47

$$
\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \frac{f^2\left(8a\sqrt{d+cdx}\sqrt{f-cfx}\sqrt{1-c^2x^2}(-24-7cx+c^2x^2)\left(\cos\left(\frac{1}{2}\text{arcs}\right.\right.\right.}{}
$$

```
[In] Integrate[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

```
[Out] (f^2*(8*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Sqrt[1 - c^2*x^2]*(-24 - 7*c*x +
c^2*x^2)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 120*a*Sqrt[d]*Sqrt[f]*
(1 + c*x)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(S
qrt[d]*Sqrt[f]*(-1 + c^2*x^2))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) -
 8*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[
c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) +
((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x
]/2]])*Sin[ArcSin[c*x]/2]) - 32*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
*(ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (c*x + 4*Log[Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*
x]/2]) + ArcSin[c*x]*((2 + Sqrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2] + (-2 + Sq
rt[1 - c^2*x^2])*Sin[ArcSin[c*x]/2])) - b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f
```

```
- c*f*x]*(20*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 2*(1
6*c*x + Cos[2*ArcSin[c*x]] + 32*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]
])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 2*ArcSin[c*x]*(24*Cos[ArcSin
[c*x]/2] + 7*Cos[(3*ArcSin[c*x])/2] + Cos[(5*ArcSin[c*x])/2] - 24*Sin[ArcSi
n[c*x]/2] + 7*Sin[(3*ArcSin[c*x])/2] - Sin[(5*ArcSin[c*x])/2]))))/(16*c*d^2
*(1 + c*x)*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]))
```

Maple [F]

$$\int \frac{(-cfx+f)^{\frac{5}{2}} (a+b\arcsin(cx))}{(cdx+d)^{\frac{3}{2}}}dx$$

```
[In] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x)
[Out] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x)
```

Fricas [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
fricas")
[Out] integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2*
x + b*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^2*d^2*x^2 + 2*c
*d^2*x + d^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate((-c*f*x+f)**(5/2)*(a+b*asin(c*x))/(c*d*x+d)**(3/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=\int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin{(cx)}+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
maxima")
```

```
[Out] -1/2*(c^2*f^3*x^3/(sqrt(-c^2*d*f*x^2 + d*f)*d) - 8*c*f^3*x^2/(sqrt(-c^2*d*f
*x^2 + d*f)*d) - 17*f^3*x/(sqrt(-c^2*d*f*x^2 + d*f)*d) + 15*f^3*arcsin(c*x)
/(sqrt(d*f)*c*d) + 24*f^3/(sqrt(-c^2*d*f*x^2 + d*f)*c*d))*a + b*sqrt(f)*int
egrate((c^2*f^2*x^2 - 2*c*f^2*x + f^2)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))/((c*d*x + d)*sqrt(c*x + 1)), x)/sqrt(d)
```

Giac [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=\int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin{(cx)}+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,{(f-c\,f\,x)}^{5/2}}{{(d+c\,d\,x)}^{3/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(3/2), x)
```

3.521 $\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 420

$$\begin{aligned}\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx &= -\frac{bf^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} \\ &- \frac{8bf^5(1-c^2x^2)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bf^5(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} \\ &- \frac{2f^5(1-cx)^4(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} \\ &+ \frac{10f^5(1-cx)^2(1-c^2x^2)^2(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{5f^5(1-c^2x^2)^3(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} \\ &+ \frac{5f^5(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{28bf^5(1-c^2x^2)^{5/2}\log(1+cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}\end{aligned}$$

```
[Out] -b*f^5*x*(-c^2*x^2+1)^(5/2)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-8/3*b*f^5*(-c^
2*x^2+1)^(5/2)/c/(c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-5/2*b*f^5*(-c^2*x
^2+1)^(5/2)*arcsin(c*x)^2/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-2/3*f^5*(-c*x+
1)^4*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+10/3
*f^5*(-c*x+1)^2*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+
f)^(5/2)+5*f^5*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f
)^(5/2)+5*f^5*(-c^2*x^2+1)^(5/2)*arcsin(c*x)*(a+b*arcsin(c*x))/c/(c*d*x+d)^
(5/2)/(-c*f*x+f)^(5/2)-28/3*b*f^5*(-c^2*x^2+1)^(5/2)*ln(c*x+1)/c/(c*d*x+d)^
(5/2)/(-c*f*x+f)^(5/2)
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 420, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4763, 683, 655, 222, 4845, 641, 45, 4737}

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx=\frac{5f^5(1-c^2x^2)^3\,(a+b\arcsin(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{10f^5(1-cx)^2\,(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{2f^5(1-cx)^4\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{5f^5(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{5bf^5(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{bf^5x(1-c^2x^2)^{5/2}}{(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{8bf^5(1-c^2x^2)^{5/2}}{3c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{28bf^5(1-c^2x^2)^{5/2}\log(cx+1)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[In] Int[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] -((b*f^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))) - (8
*b*f^5*(1 - c^2*x^2)^(5/2))/(3*c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(5
/2)) - (5*b*f^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*(
f - c*f*x)^(5/2)) - (2*f^5*(1 - c*x)^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(
3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (10*f^5*(1 - c*x)^2*(1 - c^2*x^2
)^2*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (5*f^5
*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2
)) + (5*f^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*
d*x)^(5/2)*(f - c*f*x)^(5/2)) - (28*b*f^5*(1 - c^2*x^2)^(5/2)*Log[1 + c*x])
/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 655

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[e*((
a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 683

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((m +
p)/(c*(p + 1))), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(1-c^2x^2)^{5/2}\int\frac{(f-cfx)^5(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&= -\frac{2f^5(1-cx)^4\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&\quad+\frac{10f^5(1-cx)^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{5f^5\left(1-c^2x^2\right)^3(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&\quad+\frac{5f^5\left(1-c^2x^2\right)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&\quad-\frac{\left(bc\left(1-c^2x^2\right)^{5/2}\right)\int\left(\frac{5f^5}{c}-\frac{2f^5(1-cx)^4}{3c(1-c^2x^2)^2}+\frac{10f^5(1-cx)^2}{3c(1-c^2x^2)}+\frac{5f^5\arcsin(cx)}{c\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&= -\frac{5bf^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{2f^5(1-cx)^4\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&\quad+\frac{10f^5(1-cx)^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{5f^5\left(1-c^2x^2\right)^3(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&\quad+\frac{5f^5\left(1-c^2x^2\right)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&\quad+\frac{\left(2bf^5\left(1-c^2x^2\right)^{5/2}\right)\int\frac{(1-cx)^4}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&\quad-\frac{\left(10bf^5\left(1-c^2x^2\right)^{5/2}\right)\int\frac{(1-cx)^2}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{\left(5bf^5\left(1-c^2x^2\right)^{5/2}\right)\int\frac{\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&= -\frac{5bf^5x\left(1-c^2x^2\right)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{5bf^5\left(1-c^2x^2\right)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&\quad-\frac{2f^5(1-cx)^4\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&\quad+\frac{10f^5(1-cx)^2\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{5f^5\left(1-c^2x^2\right)^3(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&\quad+\frac{5f^5\left(1-c^2x^2\right)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&\quad+\frac{\left(2bf^5\left(1-c^2x^2\right)^{5/2}\right)\int\frac{(1-cx)^2}{(1+cx)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{\left(10bf^5\left(1-c^2x^2\right)^{5/2}\right)\int\frac{1-cx}{1+cx}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}
\end{aligned}$$

$$= -\frac{5bf^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bf^5(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^5(1-cx)^4(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{10f^5(1-cx)^2(1-c^2x^2)^2(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{5f^5(1-c^2x^2)^3(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{5f^5(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(2bf^5(1-c^2x^2)^{5/2}\right)\int\left(1+\frac{4}{(1+cx)^2}-\frac{4}{1+cx}\right)dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(10bf^5(1-c^2x^2)^{5/2}\right)\int\left(-1+\frac{2}{1+cx}\right)dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bf^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{8bf^5(1-c^2x^2)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bf^5(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^5(1-cx)^4(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{10f^5(1-cx)^2(1-c^2x^2)^2(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{5f^5(1-c^2x^2)^3(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{5f^5(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{28bf^5(1-c^2x^2)^{5/2}\log(1+cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 847 vs. 2(420) = 840.

Time = 9.97 (sec) , antiderivative size = 847, normalized size of antiderivative = 2.02

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \frac{f^2\left(\frac{4a\sqrt{d+cdx}\sqrt{f-cfx}(23+34cx+3c^2x^2)}{(1+cx)^2} - 60a\sqrt{d}\sqrt{f}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right.\right.}{}$$

```
[In] Integrate[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

```
[Out] (f^2*((4*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(23 + 34*c*x + 3*c^2*x^2))/(1 +
c*x)^2 - 60*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/
(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(C
os[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2]*(-8 + 6*ArcSin[
c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) +
 Cos[(3*ArcSin[c*x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-4 + 2*(2 + 7*Sqrt[1 - c^2*x^2])*Arc
Sin[c*x] + 3*(2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 - 28*(2 + Sqrt[1 - c^2*x
```

```
^2])*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/((1
 - c*x)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) + (2*b*Sqrt[d + c*d*x]
*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c
*x])/2]*(ArcSin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Co
s[ArcSin[c*x]/2]*(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin
[c*x]/2]]) + 2*(-2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 2*(2 + Sqrt[1 -
c^2*x^2])*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2])
)/((1 - c*x)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) + (b*Sqrt[d + c*d
*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(2*(4 + 6*c*x
 + 6*c^2*x^2 + 52*(1 + c*x)*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 18*ArcSin[c*x]^2*(Cos[ArcSin[c*x
]/2] + Sin[ArcSin[c*x]/2])^3 + ArcSin[c*x]*(-24*Cos[ArcSin[c*x]/2] - 35*Cos
[(3*ArcSin[c*x])/2] + 3*Cos[(5*ArcSin[c*x])/2] + 24*Sin[ArcSin[c*x]/2] - 35
*Sin[(3*ArcSin[c*x])/2] - 3*Sin[(5*ArcSin[c*x])/2])))/((-1 + c*x)*(Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2])^4)))/(12*c*d^3)
```

Maple [F]

$$\int \frac{(-cfx+f)^{\frac{5}{2}} (a+b\arcsin(cx))}{(cdx+d)^{\frac{5}{2}}}dx$$

```
[In] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x)
```

```
[Out] int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x)
```

Fricas [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2*
x + b*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^3*d^3*x^3 + 3*c
^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx=\text{Timed out}$$

```
[In] integrate((-c*f*x+f)**(5/2)*(a+b*asin(c*x))/(c*d*x+d)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx=\int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
maxima")
```

```
[Out] 1/3*(3*(-c^2*d*f*x^2 + d*f)^(5/2)/(c^5*d^5*x^4 + 4*c^4*d^5*x^3 + 6*c^3*d^5*
x^2 + 4*c^2*d^5*x + c*d^5) - 5*(-c^2*d*f*x^2 + d*f)^(3/2)*f/(c^4*d^4*x^3 +
3*c^3*d^4*x^2 + 3*c^2*d^4*x + c*d^4) - 10*sqrt(-c^2*d*f*x^2 + d*f)*f^2/(c^3
*d^3*x^2 + 2*c^2*d^3*x + c*d^3) + 35*sqrt(-c^2*d*f*x^2 + d*f)*f^2/(c^2*d^3*
x + c*d^3) + 15*f^3*arcsin(c*x)/(c*d^3*sqrt(f/d)))*a + b*sqrt(f)*integrate(
(c^2*f^2*x^2 - 2*c*f^2*x + f^2)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1))/((c^2*d^2*x^2 + 2*c*d^2*x + d^2)*sqrt(c*x + 1)), x)/sqrt(d)
```

Giac [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx=\int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(f-c\,f\,x\right)^{5/2}}{\left(d+c\,d\,x\right)^{5/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(5/2),x)
[Out] int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(5/2), x)
```

3.522 $\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 345

$$\begin{aligned}\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx &= \frac{11bd^3x\sqrt{1-c^2x^2}}{3\sqrt{d+cdx}\sqrt{f-cfx}} \\ &+ \frac{3bcd^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{bc^2d^3x^3\sqrt{1-c^2x^2}}{9\sqrt{d+cdx}\sqrt{f-cfx}} \\ &- \frac{11d^3(1-c^2x^2)\,(a+b\arcsin(cx))}{3c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{3d^3x(1-c^2x^2)\,(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}} \\ &- \frac{cd^3x^2(1-c^2x^2)\,(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{5d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{d+cdx}\sqrt{f-cfx}}\end{aligned}$$

```
[Out] -11/3*d^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
-3/2*d^3*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-
1/3*c*d^3*x^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/
2)+11/3*b*d^3*x*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+3/4*b*c
*d^3*x^2*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/9*b*c^2*d^3*
x^3*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+5/4*d^3*(a+b*arcsin
(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 345, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.233, Rules used = {4763, 4847, 4737, 4767, 8, 4795, 30}

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \frac{5d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{cdx+d}\sqrt{f-cfx}} - \frac{cd^3x^2(1-c^2x^2)\,(a+b\arcsin(cx))}{3\sqrt{cdx+d}\sqrt{f-cfx}} - \frac{3d^3x(1-c^2x^2)\,(a+b\arcsin(cx))}{2\sqrt{cdx+d}\sqrt{f-cfx}} - \frac{11d^3(1-c^2x^2)\,(a+b\arcsin(cx))}{3c\sqrt{cdx+d}\sqrt{f-cfx}} + \frac{3bcd^3x^2\sqrt{1-c^2x^2}}{4\sqrt{cdx+d}\sqrt{f-cfx}} + \frac{11bd^3x\sqrt{1-c^2x^2}}{3\sqrt{cdx+d}\sqrt{f-cfx}} + \frac{bc^2d^3x^3\sqrt{1-c^2x^2}}{9\sqrt{cdx+d}\sqrt{f-cfx}}$$

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] (11*b*d^3*x*Sqrt[1 - c^2*x^2])/(3*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*b*c
*d^3*x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (b*c^2*d^
3*x^3*Sqrt[1 - c^2*x^2])/(9*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (11*d^3*(1 -
 c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (3*d
^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
 - (c*d^3*x^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[f
- c*f*x]) + (5*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d +
 c*d*x]*Sqrt[f - c*f*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
```

```
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{d^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{3cd^3x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{3c^2d^3x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{c^3d^3x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&= \frac{\left(d^3\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{\left(3cd^3\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad+\frac{\left(3c^2d^3\sqrt{1-c^2x^2}\right)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{\left(c^3d^3\sqrt{1-c^2x^2}\right)\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{3d^3(1-c^2x^2)(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{3d^3x(1-c^2x^2)(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad - \frac{cd^3x^2(1-c^2x^2)(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad + \frac{\left(3d^3\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{\left(3bd^3\sqrt{1-c^2x^2}\right)\int 1\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad + \frac{\left(2cd^3\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad + \frac{\left(3bcd^3\sqrt{1-c^2x^2}\right)\int x\,dx}{2\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{\left(bc^2d^3\sqrt{1-c^2x^2}\right)\int x^2\,dx}{3\sqrt{d+cdx}\sqrt{f-cfx}} \\
&= \frac{3bd^3x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{3bcd^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad + \frac{bc^2d^3x^3\sqrt{1-c^2x^2}}{9\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{11d^3(1-c^2x^2)(a+b\arcsin(cx))}{3c\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad - \frac{3d^3x(1-c^2x^2)(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{cd^3x^2(1-c^2x^2)(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad + \frac{5d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{\left(2bd^3\sqrt{1-c^2x^2}\right)\int 1\,dx}{3\sqrt{d+cdx}\sqrt{f-cfx}} \\
&= \frac{11bd^3x\sqrt{1-c^2x^2}}{3\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{3bcd^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{bc^2d^3x^3\sqrt{1-c^2x^2}}{9\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad - \frac{11d^3(1-c^2x^2)(a+b\arcsin(cx))}{3c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{3d^3x(1-c^2x^2)(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad - \frac{cd^3x^2(1-c^2x^2)(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{5d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{d+cdx}\sqrt{f-cfx}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 4.22 (sec) , antiderivative size = 270, normalized size of antiderivative = 0.78

$$
\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx =
$$

$$
-\frac{d^2\left(-90b\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2+180a\sqrt{d}\sqrt{f}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right)+6b\sqrt{d+cdx}\right.}{}
$$

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] -1/72*(d^2*(-90*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 + 180*a*Sqr
t[d]*Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + 6*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Ar
```

```
cSin[c*x]*(9*(5 + 2*c*x)*Sqrt[1 - c^2*x^2] - Cos[3*ArcSin[c*x]]) + Sqrt[d +
 c*d*x]*Sqrt[f - c*f*x]*(-270*b*c*x + 12*a*Sqrt[1 - c^2*x^2]*(22 + 9*c*x +
2*c^2*x^2) + 27*b*Cos[2*ArcSin[c*x]] + 2*b*Sin[3*ArcSin[c*x]])))/(c*f*Sqrt[
1 - c^2*x^2])
```

Maple [F]

$$\int \frac{(cdx+d)^{\frac{5}{2}}(a+b\arcsin(cx))}{\sqrt{-cfx+f}}dx$$

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

Fricas [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{\sqrt{-cfx+f}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
[Out] integral(-(a*c^2*d^2*x^2 + 2*a*c*d^2*x + a*d^2 + (b*c^2*d^2*x^2 + 2*b*c*d^2
*x + b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c*f*x - f), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))/(-c*f*x+f)**(1/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{\sqrt{-cfx+f}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] -1/6*(2*sqrt(-c^2*d*f*x^2 + d*f)*c*d^2*x^2/f + 9*sqrt(-c^2*d*f*x^2 + d*f)*d
^2*x/f - 15*d^3*arcsin(c*x)/(sqrt(d*f)*c) + 22*sqrt(-c^2*d*f*x^2 + d*f)*d^2
/(c*f))*a + b*sqrt(d)*integrate((c^2*d^2*x^2 + 2*c*d^2*x + d^2)*sqrt(c*x +
1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/sqrt(-c*x + 1), x)/sqrt(f)
```

Giac [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{\sqrt{-cfx+f}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)/sqrt(-c*f*x + f), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d+c\,d\,x\right)^{5/2}}{\sqrt{f-c\,f\,x}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(5/2))/(f - c*f*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(5/2))/(f - c*f*x)^(1/2), x)
```

3.523 $\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 242

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx=\frac{2bd^2x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{bcd^2x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{2d^2(1-c^2x^2)\,(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{d^2x(1-c^2x^2)\,(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{3d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{d+cdx}\sqrt{f-cfx}}$$

```
[Out] -2*d^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-1/
2*d^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+2*b
*d^2*x*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/4*b*c*d^2*x^2*
(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+3/4*d^2*(a+b*arcsin(c*x
))^2*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 242, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.233, Rules used = {4763, 4847, 4737, 4767, 8, 4795, 30}

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx=\frac{3d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{d^2x(1-c^2x^2)\,(a+b\arcsin(cx))}{2\sqrt{cdx+d}\sqrt{f-cfx}}-\frac{2d^2(1-c^2x^2)\,(a+b\arcsin(cx))}{c\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{bcd^2x^2\sqrt{1-c^2x^2}}{4\sqrt{cdx+d}\sqrt{f-cfx}}+\frac{2bd^2x\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] (2*b*d^2*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (b*c*d^2*
x^2*Sqrt[1 - c^2*x^2])/(4*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (2*d^2*(1 - c^
2*x^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (d^2*x*(1
 - c^2*x^2)*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (3*d
^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(4*b*c*Sqrt[d + c*d*x]*Sqrt[f -
 c*f*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
```

```
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{d^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{2cd^2x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{c^2d^2x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&= \frac{\left(d^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{\left(2cd^2\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad+\frac{\left(c^2d^2\sqrt{1-c^2x^2}\right)\int \frac{x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}} \\
&= -\frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{d^2x(1-c^2x^2)(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad+\frac{d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{\left(d^2\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad+\frac{\left(2bd^2\sqrt{1-c^2x^2}\right)\int 1\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{\left(bcd^2\sqrt{1-c^2x^2}\right)\int x\,dx}{2\sqrt{d+cdx}\sqrt{f-cfx}} \\
&= \frac{2bd^2x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{bcd^2x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}} \\
&\quad-\frac{d^2x(1-c^2x^2)(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{3d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{d+cdx}\sqrt{f-cfx}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 3.64 (sec) , antiderivative size = 238, normalized size of antiderivative = 0.98

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \frac{-4bd(4+cx)\sqrt{d+cdx}\sqrt{f-cfx}\sqrt{1-c^2x^2}\arcsin(cx)+6bd\sqrt{d+cd}}{}$$

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] (-4*b*d*(4 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Sqrt[1 - c^2*x^2]*ArcSin[
c*x] + 6*b*d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 12*a*d^(3/2)*S
qrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt
[d]*Sqrt[f]*(-1 + c^2*x^2))] + d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(16*b*c*x
- 4*a*(4 + c*x)*Sqrt[1 - c^2*x^2] - b*Cos[2*ArcSin[c*x]]))/(8*c*f*Sqrt[1 -
c^2*x^2])
```

Maple [F]

$$\int \frac{(cdx+d)^{\frac{3}{2}}\,(a+b\arcsin(cx))}{\sqrt{-cfx+f}}dx$$

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

Fricas [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{\sqrt{-cfx+f}}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c*d*x + a*d + (b*c*d*x + b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f)/(c*f*x - f), x)
```

Sympy [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \int \frac{(d(cx+1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))}{\sqrt{-f\,(cx-1)}}\,dx$$

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))/(-c*f*x+f)**(1/2),x)
[Out] Integral((d*(c*x + 1))**(3/2)*(a + b*asin(c*x))/sqrt(-f*(c*x - 1)), x)
```

Maxima [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin\,(cx)+a)}{\sqrt{-cfx+f}}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
[Out] -1/2*(sqrt(-c^2*d*f*x^2 + d*f)*d*x/f - 3*d^2*arcsin(c*x)/(sqrt(d*f)*c) + 4*
sqrt(-c^2*d*f*x^2 + d*f)*d/(c*f))*a - b*sqrt(d)*integrate((c*d*x + d)*sqrt(
c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c*x - 1
), x)/sqrt(f)
```

Giac [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin\,(cx)+a)}{\sqrt{-cfx+f}}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
giac")
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)/sqrt(-c*f*x + f), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d+c\,d\,x\right)^{3/2}}{\sqrt{f-c\,f\,x}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(3/2))/(f - c*f*x)^(1/2),x)
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(3/2))/(f - c*f*x)^(1/2), x)
```

3.524 $\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 141

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \frac{bdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{d\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}$$

```
[Out] -d*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+b*d*x*
(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/2*d*(a+b*arcsin(c*x))
^2*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4763, 4847, 4737, 4767, 8}

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \frac{d\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{cdx+d}\sqrt{f-cfx}} - \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))}{c\sqrt{cdx+d}\sqrt{f-cfx}} + \frac{bdx\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] (b*d*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (d*(1 - c^2*x
^2)*(a + b*ArcSin[c*x]))/(c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) + (d*Sqrt[1 -
c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}\\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{d(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{cdx(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\sqrt{f-cfx}}\\
&= \frac{\left(d\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{\left(cd\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}\\
&= -\frac{d(1-c^2x^2)\,(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{d\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{\left(bd\sqrt{1-c^2x^2}\right)\int 1\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}
\end{aligned}$$

$$= \frac{bdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{d\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}$$

Mathematica [A] (verified)

Time = 1.56 (sec) , antiderivative size = 200, normalized size of antiderivative = 1.42

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx$$
$$= \frac{\frac{2\sqrt{d+cdx}\sqrt{f-cfx}\left(bcx-a\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} - 2b\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx) + \frac{b\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2}{\sqrt{1-c^2x^2}} - 2a\sqrt{d}\sqrt{f}\,\mathrm{arct}}{2cf}$$

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/Sqrt[f - c*f*x],x]
```

```
[Out] ((2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(b*c*x - a*Sqrt[1 - c^2*x^2]))/Sqrt[1 -
 c^2*x^2] - 2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x] + (b*Sqrt[d + c
*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] - 2*a*Sqrt[d]*Sqrt[f
]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x
^2))])/(2*c*f)
```

Maple [F]

$$\int \frac{\sqrt{cdx+d}\,(a+b\arcsin(cx))}{\sqrt{-cfx+f}}dx$$

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x)
```

Fricas [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \int \frac{\sqrt{cdx+d}(b\arcsin(cx)+a)}{\sqrt{-cfx+f}}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c*f*x - f),
 x)
```

Sympy [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \int \frac{\sqrt{d\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))}{\sqrt{-f\,(cx-1)}}\,dx$$

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))/(-c*f*x+f)**(1/2),x)
[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))/sqrt(-f*(c*x - 1)), x)
```

Maxima [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \int \frac{\sqrt{cdx+d}(b\arcsin\,(cx)+a)}{\sqrt{-cfx+f}}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
[Out] a*(d*arcsin(c*x)/(c*f*sqrt(d/f)) - sqrt(-c^2*d*f*x^2 + d*f)/(c*f)) + b*sqrt
(d)*integrate(sqrt(c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/sqrt
(-c*x + 1), x)/sqrt(f)
```

Giac [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \int \frac{\sqrt{cdx+d}(b\arcsin\,(cx)+a)}{\sqrt{-cfx+f}}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(1/2),x, algorithm="
giac")
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)/sqrt(-c*f*x + f), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{\sqrt{f-cfx}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d+c\,d\,x}}{\sqrt{f-c\,f\,x}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(1/2))/(f - c*f*x)^(1/2),x)
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(1/2))/(f - c*f*x)^(1/2), x)
```

3.525 $\int \frac{a+b \arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}} dx$

Optimal result

Integrand size = 30, antiderivative size = 55

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx=\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}$$

```
[Out] 1/2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(
1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {4763, 4737}

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx=\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{cdx+d}\sqrt{f-cfx}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*b*c*Sqrt[d + c*d*x]*Sqrt[f - c
*f*x])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{f-cfx}}\\ &= \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}\end{aligned}$$

Mathematica [A] (verified)

Time = 1.20 (sec) , antiderivative size = 110, normalized size of antiderivative = 2.00

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx = \frac{\frac{b\sqrt{1-c^2x^2}\arcsin(cx)^2}{\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{2a\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right)}{\sqrt{d}\sqrt{f}}}{2c}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]),x]
```

```
[Out] ((b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]) - (2
*a*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^2*
x^2))])/(Sqrt[d]*Sqrt[f]))/(2*c)
```

Maple [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{cdx+d}\,\sqrt{-cfx+f}}dx$$

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x)
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx = \int \frac{b\arcsin(cx)+a}{\sqrt{cdx+d}\sqrt{-cfx+f}}\,dx$$

[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x, algorithm="fricas")

[Out] integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^2*d*f*x^2 - d*f), x)

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx = \int \frac{a+b\operatorname{asin}(cx)}{\sqrt{d(cx+1)}\sqrt{-f(cx-1)}}\,dx$$

[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(1/2)/(-c*f*x+f)**(1/2),x)

[Out] Integral((a + b*asin(c*x))/(sqrt(d*(c*x + 1))*sqrt(-f*(c*x - 1))), x)

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 32, normalized size of antiderivative = 0.58

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx = \frac{b\arcsin(cx)^2}{2\sqrt{df}c} + \frac{a\arcsin(cx)}{\sqrt{df}c}$$

[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x, algorithm="maxima")

[Out] 1/2*b*arcsin(c*x)^2/(sqrt(d*f)*c) + a*arcsin(c*x)/(sqrt(d*f)*c)

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx = \int \frac{b\arcsin(cx)+a}{\sqrt{cdx+d}\sqrt{-cfx+f}}\,dx$$

[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)/(sqrt(c*d*x + d)*sqrt(-c*f*x + f)), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(cx)}{\sqrt{d + cdx}\sqrt{f - cfx}} \, dx = \int \frac{a + b \operatorname{asin}(c\,x)}{\sqrt{d + c\,d\,x}\,\sqrt{f - c\,f\,x}} \, dx$$

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(1/2)),x)
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(1/2)), x)
```

3.526 $\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 99

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx = -\frac{f(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{bf\left(1-c^2x^2\right)^{3/2}\log(1+cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] -f*(-c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/
2)+b*f*(-c^2*x^2+1)^(3/2)*ln(c*x+1)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4763, 651, 4845, 12, 641, 31}

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx = \frac{bf\left(1-c^2x^2\right)^{3/2}\log(cx+1)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{f(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*Sqrt[f - c*f*x]),x]
```

```
[Out] -((f*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f -
 c*f*x)^(3/2))) + (b*f*(1 - c^2*x^2)^(3/2)*Log[1 + c*x])/(c*(d + c*d*x)^(3/
2)*(f - c*f*x)^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(1-c^2x^2)^{3/2}\int\frac{(f-cfx)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{f(1-cx)\,(1-c^2x^2)\,(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{\left(bc(1-c^2x^2)^{3/2}\right)\int\frac{f(1-cx)}{c(1-c^2x^2)}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{\left(bf\left(1-c^2x^2\right)^{3/2}\right)\int \frac{1-cx}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{\left(bf\left(1-c^2x^2\right)^{3/2}\right)\int \frac{1}{1+cx}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{bf\left(1-c^2x^2\right)^{3/2}\log(1+cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

Mathematica [A] (verified)

Time = 0.82 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.80

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx = \frac{\sqrt{d+cdx}\left(a(-1+cx)+b(-1+cx)\arcsin(cx)+b\sqrt{1-c^2x^2}\log(-f(1+cx\right.}{cd^2(1+cx)\sqrt{f-cfx}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*Sqrt[f - c*f*x]),x]
[Out] (Sqrt[d + c*d*x]*(a*(-1 + c*x) + b*(-1 + c*x)*ArcSin[c*x] + b*Sqrt[1 - c^2*
x^2]*Log[-(f*(1 + c*x))]))/(c*d^2*(1 + c*x)*Sqrt[f - c*f*x])
```

Maple [F]

$$\int \frac{a+b\arcsin(cx)}{(cdx+d)^{\frac{3}{2}}\sqrt{-cfx+f}}dx$$

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x)
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 348, normalized size of antiderivative = 3.52

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx = \left[\frac{(bcx+b)\sqrt{df}\log\left(\frac{c^6dfx^6+4c^5dfx^5+5c^4dfx^4-4c^2dfx^2-4cdfx-(c^4x^4+4c^3x^3+6c^2x^2+4cx)}{c^4x^4+2c^3x^3-2cx-1}\right.}{2(c^2d^2f}\right.$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
[Out] [1/2*((b*c*x + b)*sqrt(d*f)*log((c^6*d*f*x^6 + 4*c^5*d*f*x^5 + 5*c^4*d*f*x^
4 - 4*c^2*d*f*x^2 - 4*c*d*f*x - (c^4*x^4 + 4*c^3*x^3 + 6*c^2*x^2 + 4*c*x)*s
```

```
qrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(d*f) - 2*d*f)/(c^4*
x^4 + 2*c^3*x^3 - 2*c*x - 1)) - 2*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsi
n(c*x) + a))/(c^2*d^2*f*x + c*d^2*f), ((b*c*x + b)*sqrt(-d*f)*arctan((c^2*x
^2 + 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(-d
*f)/(c^4*d*f*x^4 + 2*c^3*d*f*x^3 - c^2*d*f*x^2 - 2*c*d*f*x)) - sqrt(c*d*x +
 d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a))/(c^2*d^2*f*x + c*d^2*f)]
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx=\int \frac{a+b\,\mathrm{asin}\,(cx)}{(d\,(cx+1))^{\frac{3}{2}}\,\sqrt{-f\,(cx-1)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(3/2)/(-c*f*x+f)**(1/2),x)
[Out] Integral((a + b*asin(c*x))/((d*(c*x + 1))**(3/2)*sqrt(-f*(c*x - 1))), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.97

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx=-\frac{\sqrt{-c^2dfx^2+df}b\arcsin{(cx)}}{c^2d^2fx+cd^2f}-\frac{\sqrt{-c^2dfx^2+df}a}{c^2d^2fx+cd^2f}+\frac{b\log{(cx+1)}}{cd^{\frac{3}{2}}\sqrt{f}}$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
[Out] -sqrt(-c^2*d*f*x^2 + d*f)*b*arcsin(c*x)/(c^2*d^2*f*x + c*d^2*f) - sqrt(-c^2
*d*f*x^2 + d*f)*a/(c^2*d^2*f*x + c*d^2*f) + b*log(c*x + 1)/(c*d^(3/2)*sqrt(
f))
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx=\int \frac{b\arcsin{(cx)}+a}{(cdx+d)^{\frac{3}{2}}\sqrt{-cfx+f}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x, algorithm="
giac")
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(3/2)*sqrt(-c*f*x + f)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{{\left(d+c\,d\,x\right)}^{3/2}\,\sqrt{f-c\,f\,x}}\,dx$$

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(1/2)),x)
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(1/2)), x)
```

3.527 $\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 265

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx = -\frac{bf^2(1-c^2x^2)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2f^2(1-cx)\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bf^2(1-c^2x^2)^{5/2}\operatorname{arctanh}(cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bf^2(1-c^2x^2)^{5/2}\log(1-c^2x^2)}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] -1/3*b*f^2*(-c^2*x^2+1)^(5/2)/c/(c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-2/
3*f^2*(-c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^
(5/2)+1/3*f^2*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)
^(5/2)+1/3*b*f^2*(-c^2*x^2+1)^(5/2)*arctanh(c*x)/c/(c*d*x+d)^(5/2)/(-c*f*x+
f)^(5/2)+1/6*b*f^2*(-c^2*x^2+1)^(5/2)*ln(-c^2*x^2+1)/c/(c*d*x+d)^(5/2)/(-c*
f*x+f)^(5/2)
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 265, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4763, 667, 197, 4845, 641, 46, 213, 266}

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx = \frac{f^2x(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{2f^2(1-cx)\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}} + \frac{bf^2(1-c^2x^2)^{5/2}\operatorname{arctanh}(cx)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{bf^2(1-c^2x^2)^{5/2}}{3c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}} + \frac{bf^2(1-c^2x^2)^{5/2}\log(1-c^2x^2)}{6c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*Sqrt[f - c*f*x]),x]
```

```
[Out] -1/3*(b*f^2*(1 - c^2*x^2)^(5/2))/(c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) - (2*f^2*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d
*x)^(5/2)*(f - c*f*x)^(5/2)) + (f^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/
(3*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f^2*(1 - c^2*x^2)^(5/2)*ArcTan
h[c*x])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f^2*(1 - c^2*x^2)^(5
/2)*Log[1 - c^2*x^2])/(6*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 667

```
Int[((d_) + (e_.)*(x_))^2*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[e*(
d + e*x)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((p + 2)/(c*(p +
1))), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, p}, x] && EqQ[c
*d^2 + a*e^2, 0] &&  !IntegerQ[p] && LtQ[p, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int \frac{(f-cfx)^2(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^2(1-cx)(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x(1-c^2x^2)^2(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc(1-c^2x^2)^{5/2}\right)\int\left(-\frac{2f^2(1-cx)}{3c(1-c^2x^2)^2}+\frac{f^2x}{3(1-c^2x^2)}\right)dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^2(1-cx)(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x(1-c^2x^2)^2(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(2bf^2(1-c^2x^2)^{5/2}\right)\int\frac{1-cx}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bcf^2(1-c^2x^2)^{5/2}\right)\int\frac{x}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^2(1-cx)(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x(1-c^2x^2)^2(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bf^2(1-c^2x^2)^{5/2}\log(1-c^2x^2)}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(2bf^2(1-c^2x^2)^{5/2}\right)\int\frac{1}{(1-cx)(1+cx)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2f^2(1-cx)(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x(1-c^2x^2)^2(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bf^2(1-c^2x^2)^{5/2}\log(1-c^2x^2)}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(2bf^2(1-c^2x^2)^{5/2}\right)\int\left(\frac{1}{2(1+cx)^2}-\frac{1}{2(-1+c^2x^2)}\right)dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$
\begin{aligned}
&= -\frac{bf^2(1-c^2x^2)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad - \frac{2f^2(1-cx)(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x(1-c^2x^2)^2(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad + \frac{bf^2(1-c^2x^2)^{5/2}\log(1-c^2x^2)}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bf^2(1-c^2x^2)^{5/2}\right)\int\frac{1}{-1+c^2x^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&= -\frac{bf^2(1-c^2x^2)^{5/2}}{3c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad - \frac{2f^2(1-cx)(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{f^2x(1-c^2x^2)^2(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad + \frac{bf^2(1-c^2x^2)^{5/2}\operatorname{arctanh}(cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bf^2(1-c^2x^2)^{5/2}\log(1-c^2x^2)}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.97 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.45

$$
\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx = \frac{\sqrt{d+cdx}\left((2+cx)\left(-a+acx-b\sqrt{1-c^2x^2}\right)+b(-2+cx+c^2x^2)\arcsin(cx\right.}{3cd^3(1+cx)^2\sqrt{f-cfx}}
$$

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*Sqrt[f - c*f*x]),x]
```

```
[Out] (Sqrt[d + c*d*x]*((2 + c*x)*(-a + a*c*x - b*Sqrt[1 - c^2*x^2]) + b*(-2 + c*
x + c^2*x^2)*ArcSin[c*x] + b*(1 + c*x)*Sqrt[1 - c^2*x^2]*Log[-(f*(1 + c*x))
]))/(3*c*d^3*(1 + c*x)^2*Sqrt[f - c*f*x])
```

Maple [F]

$$
\int \frac{a+b\arcsin(cx)}{(cdx+d)^{\frac{5}{2}}\sqrt{-cfx+f}}dx
$$

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 525, normalized size of antiderivative = 1.98

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx = \left[\frac{(bc^3x^3+bc^2x^2-bcx-b)\sqrt{df}\log\left(\frac{c^6dfx^6+4\,c^5dfx^5+5\,c^4dfx^4-4\,c^2dfx^2-4\,cdfx-(c^4x^4+4\cdots}{c^4x^4+2\cdots}\right.\cdots}{\cdots}\right.$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x, algorithm="
fricas")
```

```
[Out] [1/6*((b*c^3*x^3 + b*c^2*x^2 - b*c*x - b)*sqrt(d*f)*log((c^6*d*f*x^6 + 4*c^
5*d*f*x^5 + 5*c^4*d*f*x^4 - 4*c^2*d*f*x^2 - 4*c*d*f*x - (c^4*x^4 + 4*c^3*x^
3 + 6*c^2*x^2 + 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*
sqrt(d*f) - 2*d*f)/(c^4*x^4 + 2*c^3*x^3 - 2*c*x - 1)) - 2*(a*c^2*x^2 + sqrt
(-c^2*x^2 + 1)*b*c*x + a*c*x + (b*c^2*x^2 + b*c*x - 2*b)*arcsin(c*x) - 2*a)
*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*f*x^3 + c^3*d^3*f*x^2 - c^2*d^3
*f*x - c*d^3*f), 1/3*((b*c^3*x^3 + b*c^2*x^2 - b*c*x - b)*sqrt(-d*f)*arctan
((c^2*x^2 + 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*
sqrt(-d*f)/(c^4*d*f*x^4 + 2*c^3*d*f*x^3 - c^2*d*f*x^2 - 2*c*d*f*x)) - (a*c^
2*x^2 + sqrt(-c^2*x^2 + 1)*b*c*x + a*c*x + (b*c^2*x^2 + b*c*x - 2*b)*arcsin
(c*x) - 2*a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*f*x^3 + c^3*d^3*f*x
^2 - c^2*d^3*f*x - c*d^3*f)]
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx = \int \frac{a+b\operatorname{asin}(cx)}{\left(d\left(cx+1\right)\right)^{\frac{5}{2}}\sqrt{-f\left(cx-1\right)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(5/2)/(-c*f*x+f)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/((d*(c*x + 1))**(5/2)*sqrt(-f*(c*x - 1))), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 223, normalized size of antiderivative = 0.84

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx &= -\frac{1}{3}\,bc\left(\frac{1}{c^3d^{\frac{5}{2}}\sqrt{f}x+c^2d^{\frac{5}{2}}\sqrt{f}}-\frac{\log\left(cx+1\right)}{c^2d^{\frac{5}{2}}\sqrt{f}}\right)\\ &\quad -\frac{1}{3}\,b\left(\frac{\sqrt{-c^2dfx^2+df}}{c^3d^3fx^2+2\,c^2d^3fx+cd^3f}+\frac{\sqrt{-c^2dfx^2+df}}{c^2d^3fx+cd^3f}\right)\arcsin\left(cx\right)\\ &\quad -\frac{1}{3}\,a\left(\frac{\sqrt{-c^2dfx^2+df}}{c^3d^3fx^2+2\,c^2d^3fx+cd^3f}+\frac{\sqrt{-c^2dfx^2+df}}{c^2d^3fx+cd^3f}\right)\end{aligned}$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x, algorithm="
maxima")
```

```
[Out] -1/3*b*c*(1/(c^3*d^(5/2)*sqrt(f)*x + c^2*d^(5/2)*sqrt(f)) - log(c*x + 1)/(c
^2*d^(5/2)*sqrt(f))) - 1/3*b*(sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d^3*f*x^2 + 2*c
^2*d^3*f*x + c*d^3*f) + sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d^3*f*x + c*d^3*f))*a
rcsin(c*x) - 1/3*a*(sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d^3*f*x^2 + 2*c^2*d^3*f*x
 + c*d^3*f) + sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d^3*f*x + c*d^3*f))
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx=\int \frac{b\arcsin(cx)+a}{(cdx+d)^{\frac{5}{2}}\sqrt{-cfx+f}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(5/2)*sqrt(-c*f*x + f)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{{(d+c\,d\,x)}^{5/2}\,\sqrt{f-c\,f\,x}}\,dx$$

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(1/2)), x)
```

3.528 $\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 463

$$\begin{aligned}
\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx &= -\frac{3bd^4x(1-c^2x^2)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&+ \frac{bcd^4x^2(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bd^4(1+cx)^2\left(1-c^2x^2\right)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&+ \frac{15bd^4(1-c^2x^2)^{3/2}\arcsin(cx)^2}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{2d^4(1+cx)^3\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&+ \frac{15d^4(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{5d^4(1+cx)\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&- \frac{15d^4(1-c^2x^2)^{3/2}\arcsin(cx)(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{8bd^4(1-c^2x^2)^{3/2}\log(1-cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}$$

```
[Out] -3/2*b*d^4*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+b*c*d^4*x^
2*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-5/4*b*d^4*(c*x+1)^2*(
-c^2*x^2+1)^(3/2)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+15/4*b*d^4*(-c^2*x^2+1
)^(3/2)*arcsin(c*x)^2/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+2*d^4*(c*x+1)^3*(-
c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+15/2*d^4*(-
c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+5/2*d^4*(
c*x+1)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-
15/2*d^4*(-c^2*x^2+1)^(3/2)*arcsin(c*x)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)
/(-c*f*x+f)^(3/2)+8*b*d^4*(-c^2*x^2+1)^(3/2)*ln(-c*x+1)/c/(c*d*x+d)^(3/2)/(
-c*f*x+f)^(3/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 463, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {4763, 683, 685, 655, 222, 4845, 641, 45, 4737}

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \frac{5d^4(cx+1)\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}} + \frac{15d^4\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}} + \frac{2d^4(cx+1)^3\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}} - \frac{15d^4\left(1-c^2x^2\right)^{3/2}\arcsin(cx)(a+b\arcsin(cx))}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}} + \frac{15bd^4\left(1-c^2x^2\right)^{3/2}\arcsin(cx)^2}{4c(cdx+d)^{3/2}(f-cfx)^{3/2}} + \frac{bcd^4x^2\left(1-c^2x^2\right)^{3/2}}{(cdx+d)^{3/2}(f-cfx)^{3/2}} - \frac{5bd^4(cx+1)^2\left(1-c^2x^2\right)^{3/2}}{4c(cdx+d)^{3/2}(f-cfx)^{3/2}} - \frac{3bd^4x\left(1-c^2x^2\right)^{3/2}}{2(cdx+d)^{3/2}(f-cfx)^{3/2}} + \frac{8bd^4\left(1-c^2x^2\right)^{3/2}\log(1-cx)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] (-3*b*d^4*x*(1 - c^2*x^2)^(3/2))/(2*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) +
(b*c*d^4*x^2*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) - (
5*b*d^4*(1 + c*x)^2*(1 - c^2*x^2)^(3/2))/(4*c*(d + c*d*x)^(3/2)*(f - c*f*x)
^(3/2)) + (15*b*d^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]^2)/(4*c*(d + c*d*x)^(3/
2)*(f - c*f*x)^(3/2)) + (2*d^4*(1 + c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]
))/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (15*d^4*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (5*d^4*(1 + c*x)
*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(2*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3
/2)) - (15*d^4*(1 - c^2*x^2)^(3/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(2*c*(d
 + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (8*b*d^4*(1 - c^2*x^2)^(3/2)*Log[1 - c
*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 655

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[e*((
a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 683

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((m +
p)/(c*(p + 1))), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 685

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 1))), x] + Dist[2*c*
d*((m + p)/(c*(m + 2*p + 1))), Int[(d + e*x)^(m - 1)*(a + c*x^2)^p, x], x]
/; FreeQ[{a, c, d, e, p}, x] && EqQ[c*d^2 + a*e^2, 0] && GtQ[m, 1] && NeQ[m
 + 2*p + 1, 0] && IntegerQ[2*p]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
```

```
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(1-c^2x^2)^{3/2}\int \frac{(d+cdx)^4(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{2d^4(1+cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{15d^4(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad+\frac{5d^4(1+cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{15d^4(1-c^2x^2)^{3/2}\arcsin(cx)(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{\left(bc(1-c^2x^2)^{3/2}\right)\int\left(\frac{15d^4}{2c}+\frac{5d^4(1+cx)}{2c}+\frac{2d^4(1+cx)^3}{c(1-c^2x^2)}-\frac{15d^4\arcsin(cx)}{2c\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{15bd^4x(1-c^2x^2)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{5bd^4(1+cx)^2(1-c^2x^2)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad+\frac{2d^4(1+cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad+\frac{15d^4(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{5d^4(1+cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{15d^4(1-c^2x^2)^{3/2}\arcsin(cx)(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{\left(2bd^4(1-c^2x^2)^{3/2}\right)\int\frac{(1+cx)^3}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{\left(15bd^4(1-c^2x^2)^{3/2}\right)\int\frac{\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{2(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= -\frac{15bd^4x(1-c^2x^2)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{5bd^4(1+cx)^2(1-c^2x^2)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad+\frac{15bd^4(1-c^2x^2)^{3/2}\arcsin(cx)^2}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{2d^4(1+cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad+\frac{15d^4(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{5d^4(1+cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{15d^4(1-c^2x^2)^{3/2}\arcsin(cx)(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{\left(2bd^4(1-c^2x^2)^{3/2}\right)\int\frac{(1+cx)^2}{1-cx}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}$$

$$
\begin{aligned}
&= -\frac{15bd^4x(1-c^2x^2)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bd^4(1+cx)^2(1-c^2x^2)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad + \frac{15bd^4(1-c^2x^2)^{3/2}\arcsin(cx)^2}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{2d^4(1+cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad + \frac{15d^4(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{5d^4(1+cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad - \frac{15d^4(1-c^2x^2)^{3/2}\arcsin(cx)(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad - \frac{\left(2bd^4(1-c^2x^2)^{3/2}\right)\int\left(-3-cx+\frac{4}{1-cx}\right)dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{3bd^4x(1-c^2x^2)^{3/2}}{2(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{bcd^4x^2(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{5bd^4(1+cx)^2(1-c^2x^2)^{3/2}}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad + \frac{15bd^4(1-c^2x^2)^{3/2}\arcsin(cx)^2}{4c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{2d^4(1+cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad + \frac{15d^4(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{5d^4(1+cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad - \frac{15d^4(1-c^2x^2)^{3/2}\arcsin(cx)(a+b\arcsin(cx))}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{8bd^4(1-c^2x^2)^{3/2}\log(1-cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 6.11 (sec) , antiderivative size = 768, normalized size of antiderivative = 1.66

$$
\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \frac{d^2\left(\frac{8a\sqrt{d+cdx}\sqrt{f-cfx}(-24+7cx+c^2x^2)}{-1+cx} + 120a\sqrt{d}\sqrt{f}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right.\right.}{}
$$

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] (d^2*((8*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-24 + 7*c*x + c^2*x^2))/(-1 + c
*x) + 120*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(S
qrt[d]*Sqrt[f]*(-1 + c^2*x^2))] - (8*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c
*f*x]*(Cos[ArcSin[c*x]/2]*((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSi
n[c*x]/2] - Sin[ArcSin[c*x]/2]]) - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[C
os[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2
*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2])^2) - (32*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(ArcSin
[c*x]^2*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) + (c*x - 4*Log[Cos[ArcSin
[c*x]/2] - Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) -
 ArcSin[c*x]*((2 + Sqrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2] - (-2 + Sqrt[1 - c
^2*x^2])*Sin[ArcSin[c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin
```

```
[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (b*(1 + c*x
)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-20*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] -
Sin[ArcSin[c*x]/2]) + 2*(-16*c*x + Cos[2*ArcSin[c*x]] + 32*Log[Cos[ArcSin[c
*x]/2] - Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) + 2
*ArcSin[c*x]*(24*Cos[ArcSin[c*x]/2] + 7*Cos[(3*ArcSin[c*x])/2] + Cos[(5*Arc
Sin[c*x])/2] + 24*Sin[ArcSin[c*x]/2] - 7*Sin[(3*ArcSin[c*x])/2] + Sin[(5*Ar
cSin[c*x])/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2
])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2)))/(16*c*f^2)
```

Maple [F]

$$\int \frac{(cdx+d)^{\frac{5}{2}}\,(a+b\arcsin\,(cx))}{(-cfx+f)^{\frac{3}{2}}}dx$$

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

Fricas [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin\,(cx)+a)}{(-cfx+f)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c^2*d^2*x^2 + 2*a*c*d^2*x + a*d^2 + (b*c^2*d^2*x^2 + 2*b*c*d^2*
x + b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^2*f^2*x^2 - 2*c
*f^2*x + f^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))/(-c*f*x+f)**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] -1/2*(c^2*d^3*x^3/(sqrt(-c^2*d*f*x^2 + d*f)*f) + 8*c*d^3*x^2/(sqrt(-c^2*d*f
*x^2 + d*f)*f) - 17*d^3*x/(sqrt(-c^2*d*f*x^2 + d*f)*f) + 15*d^3*arcsin(c*x)
/(sqrt(d*f)*c*f) - 24*d^3/(sqrt(-c^2*d*f*x^2 + d*f)*c*f))*a - b*sqrt(d)*int
egrate((c^2*d^2*x^2 + 2*c*d^2*x + d^2)*sqrt(c*x + 1)*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))/((c*f*x - f)*sqrt(-c*x + 1)), x)/sqrt(f)
```

Giac [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d+c\,d\,x)^{5/2}}{(f-c\,f\,x)^{3/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(5/2))/(f - c*f*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(5/2))/(f - c*f*x)^(3/2), x)
```

3.529 $\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 252

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx=-\frac{bd^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{4d^3(1+cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{d^3(1-c^2x^2)^2\,(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{3d^3(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{4bd^3(1-c^2x^2)^{3/2}\log(1-cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] -b*d^3*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+4*d^3*(c*x+1)*
(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+d^3*(-c^2
*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-3/2*d^3*(-c^
2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/b/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+4*b
*d^3*(-c^2*x^2+1)^(3/2)*ln(-c*x+1)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 252, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4763, 4859, 651, 4845, 12, 641, 31, 4737, 4767, 8}

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx=-\frac{3d^3(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{d^3(1-c^2x^2)^2\,(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{4d^3(cx+1)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}-\frac{bd^3x(1-c^2x^2)^{3/2}}{(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{4bd^3(1-c^2x^2)^{3/2}\log(1-cx)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] -((b*d^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))) + (4
*d^3*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f -
 c*f*x)^(3/2)) + (d^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(
3/2)*(f - c*f*x)^(3/2)) - (3*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/(2*b*c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (4*b*d^3*(1 - c^2*x^2)^(3/2)
*Log[1 - c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
```

```
e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(1-c^2x^2)^{3/2}\int \frac{(d+cdx)^3(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{(1-c^2x^2)^{3/2}\int \left(\frac{4(d^3+cd^3x)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}-\frac{3d^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}-\frac{cd^3x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{\left(4(1-c^2x^2)^{3/2}\right)\int \frac{(d^3+cd^3x)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{\left(3d^3(1-c^2x^2)^{3/2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{\left(cd^3(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{4d^3(1+cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad + \frac{d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{3d^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad - \frac{\left(4bc\left(1-c^2x^2\right)^{3/2}\right)\int \frac{d^3(1+cx)}{c(1-c^2x^2)}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(bd^3\left(1-c^2x^2\right)^{3/2}\right)\int 1\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&= -\frac{bd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{4d^3(1+cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad + \frac{d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{3d^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad - \frac{\left(4bd^3\left(1-c^2x^2\right)^{3/2}\right)\int \frac{1+cx}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&= -\frac{bd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{4d^3(1+cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad + \frac{d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad - \frac{3d^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(4bd^3\left(1-c^2x^2\right)^{3/2}\right)\int \frac{1}{1-cx}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&= -\frac{bd^3x\left(1-c^2x^2\right)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{4d^3(1+cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad + \frac{d^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} \\
&\quad - \frac{3d^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{4bd^3\left(1-c^2x^2\right)^{3/2}\log(1-cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}
$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 514 vs. 2(252) = 504.

Time = 5.33 (sec) , antiderivative size = 514, normalized size of antiderivative = 2.04

$$
\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \frac{d\left(\frac{2a(-5+cx)\sqrt{d+cdx}\sqrt{f-cfx}}{-1+cx} + 6a\sqrt{d}\sqrt{f}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right) - \frac{b(1+cx}{}\right.}{}
$$

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] (d*((2*a*(-5 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(-1 + c*x) + 6*a*Sqrt[
d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-
```

```
1 + c^2*x^2))] - (b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c
*x]/2]*((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] - Sin[Arc
Sin[c*x]/2]]) - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] -
 Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c
*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) -
 (2*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(ArcSin[c*x]^2*(Cos[ArcSin[
c*x]/2] - Sin[ArcSin[c*x]/2]) + (c*x - 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSi
n[c*x]/2]])*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - ArcSin[c*x]*((2 + S
qrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2] - (-2 + Sqrt[1 - c^2*x^2])*Sin[ArcSin[
c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2)))/(2*c*f^2)
```

Maple [F]

$$\int \frac{(cdx+d)^{\frac{3}{2}}(a+b\arcsin(cx))}{(-cfx+f)^{\frac{3}{2}}}dx$$

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

Fricas [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral((a*c*d*x + a*d + (b*c*d*x + b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt
(-c*f*x + f)/(c^2*f^2*x^2 - 2*c*f^2*x + f^2), x)
```

Sympy [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \int \frac{(d(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))}{(-f(cx-1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))/(-c*f*x+f)**(3/2),x)
```

```
[Out] Integral((d*(c*x + 1))**(3/2)*(a + b*asin(c*x))/(-f*(c*x - 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] b*sqrt(d)*sqrt(f)*integrate((c*d*x + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*f^2*x^2 - 2*c*f^2*x + f^2), x) -
a*((-c^2*d*f*x^2 + d*f)^(3/2)/(c^3*f^3*x^2 - 2*c^2*f^3*x + c*f^3) + 6*sqrt(
-c^2*d*f*x^2 + d*f)*d/(c^2*f^2*x - c*f^2) + 3*d^2*arcsin(c*x)/(c*f^2*sqrt(d
/f)))
```

Giac [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d+c\,d\,x)^{3/2}}{(f-c\,f\,x)^{3/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(3/2))/(f - c*f*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(3/2))/(f - c*f*x)^(3/2), x)
```

3.530 $\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 162

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \frac{2d^2(1+cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{d^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{2bd^2\left(1-c^2x^2\right)^{3/2}\log(1-cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] 2*d^2*(c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(
3/2)-1/2*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/b/c/(c*d*x+d)^(3/2)/(-c
*f*x+f)^(3/2)+2*b*d^2*(-c^2*x^2+1)^(3/2)*ln(-c*x+1)/c/(c*d*x+d)^(3/2)/(-c*f
*x+f)^(3/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4763, 4859, 651, 4845, 12, 641, 31, 4737}

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = -\frac{d^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{2bc(cdx+d)^{3/2}(f-cfx)^{3/2}} + \frac{2d^2(cx+1)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}} + \frac{2bd^2\left(1-c^2x^2\right)^{3/2}\log(1-cx)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] (2*d^2*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f
 - c*f*x)^(3/2)) - (d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(2*b*c*(
```

```
d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)) + (2*b*d^2*(1 - c^2*x^2)^(3/2)*Log[1 -
c*x])/(c*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
```

```
, 3])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{(1-c^2x^2)^{3/2}\int \frac{(d+cdx)^2(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{(1-c^2x^2)^{3/2}\int \left(\frac{2(d^2+cd^2x)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}-\frac{d^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{\left(2(1-c^2x^2)^{3/2}\right)\int \frac{(d^2+cd^2x)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{\left(d^2(1-c^2x^2)^{3/2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{2d^2(1+cx)(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{d^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{\left(2bc(1-c^2x^2)^{3/2}\right)\int \frac{d^2(1+cx)}{c(1-c^2x^2)}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{2d^2(1+cx)(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{d^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{\left(2bd^2(1-c^2x^2)^{3/2}\right)\int \frac{1+cx}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{2d^2(1+cx)(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{d^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{\left(2bd^2(1-c^2x^2)^{3/2}\right)\int \frac{1}{1-cx}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&= \frac{2d^2(1+cx)(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}\\
&\quad-\frac{d^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{2bd^2(1-c^2x^2)^{3/2}\log(1-cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 2.36 (sec) , antiderivative size = 281, normalized size of antiderivative = 1.73

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = -\frac{\frac{4a\sqrt{d+cdx}\sqrt{f-cfx}}{-1+cx} - 2a\sqrt{d}\sqrt{f}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right) + \frac{b(1+cx)\sqrt{d+cdx}\sqrt{f-cfx}(\cos(\frac{1}{2}\arcsin(cx))((-4+\arcsin(cx))\arcsin(cx)}{\sqrt{1-c^2x^2}}}{2cf^2}$$

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/(f - c*f*x)^(3/2),x]
```

```
[Out] -1/2*((4*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(-1 + c*x) - 2*a*Sqrt[d]*Sqrt[f
]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x
^2))] + (b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]*((
-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/
2]]) - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcS
in[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] -
Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2))/(c*f^2)
```

Maple [F]

$$\int \frac{\sqrt{cdx+d}\,(a+b\arcsin(cx))}{(-cfx+f)^{\frac{3}{2}}}dx$$

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x)
```

Fricas [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \int \frac{\sqrt{cdx+d}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^2*f^2*x^2
- 2*c*f^2*x + f^2), x)
```

Sympy [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \int \frac{\sqrt{d(cx+1)}(a+b\operatorname{asin}(cx))}{(-f(cx-1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))/(-c*f*x+f)**(3/2),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))/(-f*(c*x - 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \int \frac{\sqrt{cdx+d}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] -a*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^2*f^2*x - c*f^2) + d*arcsin(c*x)/(c*f^2*s
qrt(d/f))) - b*sqrt(d)*integrate(sqrt(c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1))/((c*f*x - f)*sqrt(-c*x + 1)), x)/sqrt(f)
```

Giac [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \int \frac{\sqrt{cdx+d}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(c\,x))\,\sqrt{d+c\,d\,x}}{(f-c\,f\,x)^{3/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(1/2))/(f - c*f*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(1/2))/(f - c*f*x)^(3/2), x)
```

3.531 $\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 98

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx = \frac{d(1+cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{bd(1-c^2x^2)^{3/2}\log(1-cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] d*(c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)
+b*d*(-c^2*x^2+1)^(3/2)*ln(-c*x+1)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4763, 651, 4845, 12, 641, 31}

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx = \frac{d(cx+1)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(f-cfx)^{3/2}} + \frac{bd(1-c^2x^2)^{3/2}\log(1-cx)}{c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)),x]
```

```
[Out] (d*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(3/2)*(f - c
*f*x)^(3/2)) + (b*d*(1 - c^2*x^2)^(3/2)*Log[1 - c*x])/(c*(d + c*d*x)^(3/2)*
(f - c*f*x)^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 651

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[((-a
)*e + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{3/2}\int\frac{(d+cdx)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{d(1+cx)\,(1-c^2x^2)\,(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(bc(1-c^2x^2)^{3/2}\right)\int\frac{d(1+cx)}{c(1-c^2x^2)}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{d(1+cx)(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(bd(1-c^2x^2)^{3/2}\right)\int \frac{1+cx}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{d(1+cx)(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{\left(bd(1-c^2x^2)^{3/2}\right)\int \frac{1}{1-cx}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

$$= \frac{d(1+cx)(1-c^2x^2)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{bd(1-c^2x^2)^{3/2}\log(1-cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

Mathematica [A] (verified)

Time = 0.92 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.08

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx = \frac{\sqrt{d+cdx}\sqrt{f-cfx}\left(-a\sqrt{1-c^2x^2}-b\sqrt{1-c^2x^2}\arcsin(cx)+b(-1+cx)\log(\right.}{cdf^2(-1+cx)\sqrt{1-c^2x^2}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)),x]
[Out] (Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-(a*Sqrt[1 - c^2*x^2]) - b*Sqrt[1 - c^2*x
^2]*ArcSin[c*x] + b*(-1 + c*x)*Log[f - c*f*x]))/(c*d*f^2*(-1 + c*x)*Sqrt[1
- c^2*x^2])
```

Maple [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{cdx+d}\,(-cfx+f)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x)
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 354, normalized size of antiderivative = 3.61

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx = \left[\frac{(bcx-b)\sqrt{df}\log\left(\frac{c^6dfx^6-4c^5dfx^5+5c^4dfx^4-4c^2dfx^2+4cdfx-(c^4x^4-4c^3x^3+6c^2x^2-4cx)\sqrt{}}{c^4x^4-2c^3x^3+2cx-1}\right.}{2(c^2df^2x}\right.$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
[Out] [1/2*((b*c*x - b)*sqrt(d*f)*log((c^6*d*f*x^6 - 4*c^5*d*f*x^5 + 5*c^4*d*f*x^
4 - 4*c^2*d*f*x^2 + 4*c*d*f*x - (c^4*x^4 - 4*c^3*x^3 + 6*c^2*x^2 - 4*c*x)*s
```

```
qrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(d*f) - 2*d*f)/(c^4*
x^4 - 2*c^3*x^3 + 2*c*x - 1)) - 2*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsi
n(c*x) + a))/(c^2*d*f^2*x - c*d*f^2), ((b*c*x - b)*sqrt(-d*f)*arctan((c^2*x
^2 - 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(-d
*f)/(c^4*d*f*x^4 - 2*c^3*d*f*x^3 - c^2*d*f*x^2 + 2*c*d*f*x)) - sqrt(c*d*x +
 d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a))/(c^2*d*f^2*x - c*d*f^2)]
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx=\int \frac{a+b\operatorname{asin}(cx)}{\sqrt{d(cx+1)}\,(-f(cx-1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(1/2)/(-c*f*x+f)**(3/2),x)
[Out] Integral((a + b*asin(c*x))/(sqrt(d*(c*x + 1))*(-f*(c*x - 1))**(3/2)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.00

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx=-\frac{\sqrt{-c^2dfx^2+df}\,b\arcsin(cx)}{c^2df^2x-cdf^2}-\frac{\sqrt{-c^2dfx^2+df}\,a}{c^2df^2x-cdf^2}+\frac{b\log(cx-1)}{c\sqrt{d}f^{\frac{3}{2}}}$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
[Out] -sqrt(-c^2*d*f*x^2 + d*f)*b*arcsin(c*x)/(c^2*d*f^2*x - c*d*f^2) - sqrt(-c^2
*d*f*x^2 + d*f)*a/(c^2*d*f^2*x - c*d*f^2) + b*log(c*x - 1)/(c*sqrt(d)*f^(3/
2))
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx=\int \frac{b\arcsin(cx)+a}{\sqrt{cdx+d}(-cfx+f)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x, algorithm="
giac")
[Out] integrate((b*arcsin(c*x) + a)/(sqrt(c*d*x + d)*(-c*f*x + f)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{\sqrt{d+c\,d\,x}\,{\left(f-c\,f\,x\right)}^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(3/2)),x)
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(3/2)), x)
```

3.532 $\int \frac{a+b \arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}} dx$

Optimal result

Integrand size = 30, antiderivative size = 96

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx=\frac{x(1-c^2x^2)\,(a+b\arcsin(cx))}{(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{b(1-c^2x^2)^{3/2}\log\left(1-c^2x^2\right)}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

```
[Out] x*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+1/2*b*(-c
^2*x^2+1)^(3/2)*ln(-c^2*x^2+1)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {4763, 4745, 266}

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx=\frac{x(1-c^2x^2)\,(a+b\arcsin(cx))}{(cdx+d)^{3/2}(f-cfx)^{3/2}}+\frac{b(1-c^2x^2)^{3/2}\log\left(1-c^2x^2\right)}{2c(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)),x]
```

```
[Out] (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
 + (b*(1 - c^2*x^2)^(3/2)*Log[1 - c^2*x^2])/(2*c*(d + c*d*x)^(3/2)*(f - c*f
*x)^(3/2))
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{(1-c^2x^2)^{3/2}\int\frac{a+b\arcsin(cx)}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\ &= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))}{(d+cdx)^{3/2}(f-cfx)^{3/2}}-\frac{\left(bc(1-c^2x^2)^{3/2}\right)\int\frac{x}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\\ &= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))}{(d+cdx)^{3/2}(f-cfx)^{3/2}}+\frac{b(1-c^2x^2)^{3/2}\log\left(1-c^2x^2\right)}{2c(d+cdx)^{3/2}(f-cfx)^{3/2}}\end{aligned}$$

Mathematica [A] (verified)

Time = 1.13 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.09

$$\int\frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx=\frac{\sqrt{d+cdx}\big(2acx+2bcx\arcsin(cx)+b\sqrt{1-c^2x^2}\log(-f(1+cx))+b\sqrt{1-}}{2cd^2f(1+cx)\sqrt{f-cfx}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*(2*a*c*x + 2*b*c*x*ArcSin[c*x] + b*Sqrt[1 - c^2*x^2]*Log[-
(f*(1 + c*x))] + b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x]))/(2*c*d^2*f*(1 + c*x)*
Sqrt[f - c*f*x])
```

Maple [F]

$$\int \frac{a+b\arcsin(cx)}{(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x)
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx = \int \frac{b\arcsin(cx)+a}{(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^4*d^2*f^2*
x^4 - 2*c^2*d^2*f^2*x^2 + d^2*f^2), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx = \int \frac{a+b\operatorname{asin}(cx)}{(d(cx+1))^{\frac{3}{2}}(-f(cx-1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(3/2)/(-c*f*x+f)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/((d*(c*x + 1))**(3/2)*(-f*(c*x - 1))**(3/2)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.90

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx = \frac{bx\arcsin(cx)}{\sqrt{-c^2dfx^2+df}\,df} + \frac{ax}{\sqrt{-c^2dfx^2+df}\,df} - \frac{b\sqrt{\frac{1}{df}}\log\left(x^2-\frac{1}{c^2}\right)}{2\,cdf}$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] b*x*arcsin(c*x)/(sqrt(-c^2*d*f*x^2 + d*f)*d*f) + a*x/(sqrt(-c^2*d*f*x^2 + d
*f)*d*f) - 1/2*b*sqrt(1/(d*f))*log(x^2 - 1/c^2)/(c*d*f)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx=\int \frac{b\arcsin{(cx)}+a}{(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x, algorithm="
giac")
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(3/2)*(-c*f*x + f)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{{(d+c\,d\,x)}^{3/2}\,{(f-c\,f\,x)}^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)),x)
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)), x)
```

3.533 $\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 255

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx=-\frac{bf(1-c^2x^2)^{5/2}}{6c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} -\frac{f(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{2fx(1-c^2x^2)^2\left(a+b\arcsin(cx)\right)}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} +\frac{bf(1-c^2x^2)^{5/2}\operatorname{arctanh}(cx)}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{bf(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] -1/6*b*f*(-c^2*x^2+1)^(5/2)/c/(c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-1/3*
f*(-c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2
)+2/3*f*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
+1/6*b*f*(-c^2*x^2+1)^(5/2)*arctanh(c*x)/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
+1/3*b*f*(-c^2*x^2+1)^(5/2)*ln(-c^2*x^2+1)/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/
2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 255, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4763, 653, 197, 4845, 641, 46, 213, 266}

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx=\frac{2fx(1-c^2x^2)^2\left(a+b\arcsin(cx)\right)}{3(cdx+d)^{5/2}(f-cfx)^{5/2}} -\frac{f(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bf(1-c^2x^2)^{5/2}\operatorname{arctanh}(cx)}{6c(cdx+d)^{5/2}(f-cfx)^{5/2}} -\frac{bf(1-c^2x^2)^{5/2}}{6c(cx+1)(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{bf(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)),x]
```

```
[Out] -1/6*(b*f*(1 - c^2*x^2)^(5/2))/(c*(1 + c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(
5/2)) - (f*(1 - c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5
/2)*(f - c*f*x)^(5/2)) + (2*f*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3*(d
+ c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f*(1 - c^2*x^2)^(5/2)*ArcTanh[c*x])/
(6*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*f*(1 - c^2*x^2)^(5/2)*Log[1
- c^2*x^2])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 653

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[((a*e
 - c*d*x)/(2*a*c*(p + 1)))*(a + c*x^2)^(p + 1), x] + Dist[d*((2*p + 3)/(2*a
*(p + 1))), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e}, x] && Lt
Q[p, -1] && NeQ[p, -3/2]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int \frac{(f-cfx)(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx(1-c^2x^2)^2(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc(1-c^2x^2)^{5/2}\right)\int\left(-\frac{f(1-cx)}{3c(1-c^2x^2)^2}+\frac{2fx}{3(1-c^2x^2)}\right)dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx(1-c^2x^2)^2(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bf(1-c^2x^2)^{5/2}\right)\int\frac{1-cx}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(2bcf(1-c^2x^2)^{5/2}\right)\int\frac{x}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx(1-c^2x^2)^2(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bf(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bf(1-c^2x^2)^{5/2}\right)\int\frac{1}{(1-cx)(1+cx)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{f(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx(1-c^2x^2)^2(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bf(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bf(1-c^2x^2)^{5/2}\right)\int\left(\frac{1}{2(1+cx)^2}-\frac{1}{2(-1+c^2x^2)}\right)dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bf(1-c^2x^2)^{5/2}}{6c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{f(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bf(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bf(1-c^2x^2)^{5/2}\right)\int\frac{1}{-1+c^2x^2}\,dx}{6(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bf(1-c^2x^2)^{5/2}}{6c(1+cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{f(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2fx(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bf(1-c^2x^2)^{5/2}\operatorname{arctanh}(cx)}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bf(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

Mathematica [A] (verified)

Time = 1.33 (sec) , antiderivative size = 180, normalized size of antiderivative = 0.71

$$\int\frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx = \frac{\sqrt{d+cdx}\left(-4a+8acx+8ac^2x^2-2b\sqrt{1-c^2x^2}+4b(-1+2cx+2c^2x^2)\text{ ar}\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*(-4*a + 8*a*c*x + 8*a*c^2*x^2 - 2*b*Sqrt[1 - c^2*x^2] + 4*
b*(-1 + 2*c*x + 2*c^2*x^2)*ArcSin[c*x] + 5*b*(1 + c*x)*Sqrt[1 - c^2*x^2]*Lo
g[-(f*(1 + c*x))] + 3*b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x] + 3*b*c*x*Sqrt[1 -
 c^2*x^2]*Log[f - c*f*x]))/(12*c*d^3*f*(1 + c*x)^2*Sqrt[f - c*f*x])
```

Maple [F]

$$\int\frac{a+b\arcsin(cx)}{(cdx+d)^{\frac{5}{2}}\,(-cfx+f)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x)
```

Fricas [F]

$$\int \frac{a + b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx = \int \frac{b\arcsin(cx) + a}{(cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x, algorithm="
fricas")
```

```
[Out] integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^5*d^3*f^2*
x^5 + c^4*d^3*f^2*x^4 - 2*c^3*d^3*f^2*x^3 - 2*c^2*d^3*f^2*x^2 + c*d^3*f^2*x
 + d^3*f^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a + b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(5/2)/(-c*f*x+f)**(3/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 234, normalized size of antiderivative = 0.92

$$\int \frac{a + b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx = -\frac{1}{12}\,bc\left(\frac{2\sqrt{d}\sqrt{f}}{c^3d^3f^2x + c^2d^3f^2} - \frac{5\,\log\left(cx+1\right)}{c^2d^{\frac{5}{2}}f^{\frac{3}{2}}} - \frac{3\,\log\left(cx-1\right)}{c^2d^{\frac{5}{2}}f^{\frac{3}{2}}}\right) - \frac{1}{3}\,b\left(\frac{1}{\sqrt{-c^2dfx^2+df}\,c^2d^2fx + \sqrt{-c^2dfx^2+df}\,cd^2f} - \frac{2\,x}{\sqrt{-c^2dfx^2+df}\,d^2f}\right)\arcsin\left(cx\right) - \frac{1}{3}\,a\left(\frac{1}{\sqrt{-c^2dfx^2+df}\,c^2d^2fx + \sqrt{-c^2dfx^2+df}\,cd^2f} - \frac{2\,x}{\sqrt{-c^2dfx^2+df}\,d^2f}\right)$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x, algorithm="
maxima")
```

```
[Out] -1/12*b*c*(2*sqrt(d)*sqrt(f)/(c^3*d^3*f^2*x + c^2*d^3*f^2) - 5*log(c*x + 1)
/(c^2*d^(5/2)*f^(3/2)) - 3*log(c*x - 1)/(c^2*d^(5/2)*f^(3/2))) - 1/3*b*(1/(
sqrt(-c^2*d*f*x^2 + d*f)*c^2*d^2*f*x + sqrt(-c^2*d*f*x^2 + d*f)*c*d^2*f) -
2*x/(sqrt(-c^2*d*f*x^2 + d*f)*d^2*f))*arcsin(c*x) - 1/3*a*(1/(sqrt(-c^2*d*f
*x^2 + d*f)*c^2*d^2*f*x + sqrt(-c^2*d*f*x^2 + d*f)*c*d^2*f) - 2*x/(sqrt(-c^
2*d*f*x^2 + d*f)*d^2*f))
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx = \int \frac{b\arcsin{(cx)}+a}{(cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(5/2)*(-c*f*x + f)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{{(d+c\,d\,x)}^{5/2}\,{(f-c\,f\,x)}^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)), x)
```

3.534 $\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 419

$$\begin{aligned}\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx &= \frac{bd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&-\frac{8bd^5(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{5bd^5(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&+\frac{2d^5(1+cx)^4(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&-\frac{10d^5(1+cx)^2(1-c^2x^2)^2(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{5d^5(1-c^2x^2)^3(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}}\\
&+\frac{5d^5(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}}-\frac{28bd^5(1-c^2x^2)^{5/2}\log(1-cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}\end{aligned}$$

```
[Out] b*d^5*x*(-c^2*x^2+1)^(5/2)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-8/3*b*d^5*(-c^2
*x^2+1)^(5/2)/c/(-c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-5/2*b*d^5*(-c^2*x
^2+1)^(5/2)*arcsin(c*x)^2/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+2/3*d^5*(c*x+1
)^4*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-10/3*
d^5*(c*x+1)^2*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)
^(5/2)-5*d^5*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^
(5/2)+5*d^5*(-c^2*x^2+1)^(5/2)*arcsin(c*x)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5
/2)/(-c*f*x+f)^(5/2)-28/3*b*d^5*(-c^2*x^2+1)^(5/2)*ln(-c*x+1)/c/(c*d*x+d)^(
5/2)/(-c*f*x+f)^(5/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 419, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4763, 683, 655, 222, 4845, 641, 45, 4737}

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = -\frac{5d^5(1-c^2x^2)^3\,(a+b\arcsin(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{10d^5(cx+1)^2\,(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}} + \frac{2d^5(cx+1)^4\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}} + \frac{5d^5(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{5bd^5(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(cdx+d)^{5/2}(f-cfx)^{5/2}} + \frac{bd^5x(1-c^2x^2)^{5/2}}{(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{8bd^5(1-c^2x^2)^{5/2}}{3c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{28bd^5(1-c^2x^2)^{5/2}\log(1-cx)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (b*d^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (8*b*
d^5*(1 - c^2*x^2)^(5/2))/(3*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)
) - (5*b*d^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*(f -
 c*f*x)^(5/2)) + (2*d^5*(1 + c*x)^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c
*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (10*d^5*(1 + c*x)^2*(1 - c^2*x^2)^2
*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (5*d^5*(1
 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
+ (5*d^5*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*d*x
)^(5/2)*(f - c*f*x)^(5/2)) - (28*b*d^5*(1 - c^2*x^2)^(5/2)*Log[1 - c*x])/(3
*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 655

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[e*((
a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Dist[d, Int[(a + c*x^2)^p, x], x] /
; FreeQ[{a, c, d, e, p}, x] && NeQ[p, -1]
```

Rule 683

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((m +
p)/(c*(p + 1))), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int\frac{(d+cdx)^5(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^5(1+cx)^4(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{10d^5(1+cx)^2(1-c^2x^2)^2(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5d^5(1-c^2x^2)^3(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{5d^5(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc(1-c^2x^2)^{5/2}\right)\int\left(-\frac{5d^5}{c}+\frac{2d^5(1+cx)^4}{3c(1-c^2x^2)^2}-\frac{10d^5(1+cx)^2}{3c(1-c^2x^2)}+\frac{5d^5\arcsin(cx)}{c\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{5bd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^5(1+cx)^4(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{10d^5(1+cx)^2(1-c^2x^2)^2(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5d^5(1-c^2x^2)^3(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{5d^5(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(2bd^5(1-c^2x^2)^{5/2}\right)\int\frac{(1+cx)^4}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(10bd^5(1-c^2x^2)^{5/2}\right)\int\frac{(1+cx)^2}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(5bd^5(1-c^2x^2)^{5/2}\right)\int\frac{\arcsin(cx)}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{5bd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bd^5(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^5(1+cx)^4(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{10d^5(1+cx)^2(1-c^2x^2)^2(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5d^5(1-c^2x^2)^3(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{5d^5(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(2bd^5(1-c^2x^2)^{5/2}\right)\int\frac{(1+cx)^2}{(1-cx)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(10bd^5(1-c^2x^2)^{5/2}\right)\int\frac{1+cx}{1-cx}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$
\begin{aligned}
&= \frac{5bd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5bd^5(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad + \frac{2d^5(1+cx)^4(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad - \frac{10d^5(1+cx)^2(1-c^2x^2)^2(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5d^5(1-c^2x^2)^3(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad + \frac{5d^5(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad - \frac{\left(2bd^5(1-c^2x^2)^{5/2}\right)\int\left(1+\frac{4}{(-1+cx)^2}+\frac{4}{-1+cx}\right)dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad + \frac{\left(10bd^5(1-c^2x^2)^{5/2}\right)\int\left(-1-\frac{2}{-1+cx}\right)dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&= \frac{bd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{8bd^5(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad - \frac{5bd^5(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^5(1+cx)^4(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad - \frac{10d^5(1+cx)^2(1-c^2x^2)^2(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{5d^5(1-c^2x^2)^3(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad + \frac{5d^5(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{28bd^5(1-c^2x^2)^{5/2}\log(1-cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}
\end{aligned}
$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 850 vs. $2(419) = 838$.

Time = 7.25 (sec) , antiderivative size = 850, normalized size of antiderivative = 2.03

$$
\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \frac{d^2\left(-\frac{4a\sqrt{d+cdx}\sqrt{f-cfx}(23-34cx+3c^2x^2)}{(-1+cx)^2} - 60a\sqrt{d}\sqrt{f}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-c}}{\sqrt{d}\sqrt{f}(-1+c^2x}\right.\right.}{}
$$

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (d^2*((-4*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(23 - 34*c*x + 3*c^2*x^2))/(-1
 + c*x)^2 - 60*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
)/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*
(Cos[ArcSin[c*x]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]]) - Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Log[Cos[ArcSin[c*x
]/2] - Sin[ArcSin[c*x]/2]]) + 2*(2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] +
2*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin
[ArcSin[c*x]/2]))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[
```

```
c*x]/2] + Sin[ArcSin[c*x]/2])) + (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[
ArcSin[c*x]/2]*(-8 - 6*ArcSin[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*(-(ArcSin[c*x]*(14 +
3*ArcSin[c*x])) + 28*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(4 +
 2*(2 + 7*Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 3*(2 + Sqrt[1 - c^2*x^2])*ArcSin
[c*x]^2 + 28*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2]])*Sin[ArcSin[c*x]/2]))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) + (b*Sqrt[d + c*d*x]*Sqrt[f - c*f
*x]*(2*(-7 + 6*c*x + 3*Cos[2*ArcSin[c*x]] + 52*(-1 + c*x)*Log[Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) + 18
*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + ArcSin[c*x]*(-
24*Cos[ArcSin[c*x]/2] - 35*Cos[(3*ArcSin[c*x])/2] + 3*Cos[(5*ArcSin[c*x])/2
] - 24*Sin[ArcSin[c*x]/2] + 35*Sin[(3*ArcSin[c*x])/2] + 3*Sin[(5*ArcSin[c*x
])/2])))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] +
 Sin[ArcSin[c*x]/2]))))/(12*c*f^3)
```

Maple [F]

$$\int \frac{(cdx+d)^{\frac{5}{2}} (a+b \arcsin (cx))}{(-cfx+f)^{\frac{5}{2}}}dx$$

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

Fricas [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-(a*c^2*d^2*x^2 + 2*a*c*d^2*x + a*d^2 + (b*c^2*d^2*x^2 + 2*b*c*d^2
*x + b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^3*f^3*x^3 - 3*
c^2*f^3*x^2 + 3*c*f^3*x - f^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))/(-c*f*x+f)**(5/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
[Out] -1/3*(3*(-c^2*d*f*x^2 + d*f)^(5/2)/(c^5*f^5*x^4 - 4*c^4*f^5*x^3 + 6*c^3*f^5
*x^2 - 4*c^2*f^5*x + c*f^5) + 5*(-c^2*d*f*x^2 + d*f)^(3/2)*d/(c^4*f^4*x^3 -
 3*c^3*f^4*x^2 + 3*c^2*f^4*x - c*f^4) - 10*sqrt(-c^2*d*f*x^2 + d*f)*d^2/(c^
3*f^3*x^2 - 2*c^2*f^3*x + c*f^3) - 35*sqrt(-c^2*d*f*x^2 + d*f)*d^2/(c^2*f^3
*x - c*f^3) - 15*d^3*arcsin(c*x)/(c*f^3*sqrt(d/f)))*a + b*sqrt(d)*integrate
((c^2*d^2*x^2 + 2*c*d^2*x + d^2)*sqrt(c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1))/((c^2*f^2*x^2 - 2*c*f^2*x + f^2)*sqrt(-c*x + 1)), x)/sqrt(f)
```

Giac [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
giac")
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(d+c\,d\,x\right)^{5/2}}{\left(f-c\,f\,x\right)^{5/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(5/2))/(f - c*f*x)^(5/2),x)
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(5/2))/(f - c*f*x)^(5/2), x)
```

3.535 $\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 324

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = -\frac{4bd^4(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bd^4(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^4(1+cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2d^4(1+cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^4(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{8bd^4(1-c^2x^2)^{5/2}\log(1-cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] -4/3*b*d^4*(-c^2*x^2+1)^(5/2)/c/(-c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-1
/2*b*d^4*(-c^2*x^2+1)^(5/2)*arcsin(c*x)^2/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2
)+2/3*d^4*(c*x+1)^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*
x+f)^(5/2)-2*d^4*(c*x+1)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)
/(-c*f*x+f)^(5/2)+d^4*(-c^2*x^2+1)^(5/2)*arcsin(c*x)*(a+b*arcsin(c*x))/c/(c
*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)-8/3*b*d^4*(-c^2*x^2+1)^(5/2)*ln(-c*x+1)/c/(c
*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
```

Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 324, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {4763, 683, 667, 222, 4845, 641, 45, 31, 4737}

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = -\frac{2d^4(cx+1)\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}} + \frac{2d^4(cx+1)^3\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}} + \frac{d^4\left(1-c^2x^2\right)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{bd^4\left(1-c^2x^2\right)^{5/2}\arcsin(cx)^2}{2c(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{4bd^4\left(1-c^2x^2\right)^{5/2}}{3c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{8bd^4\left(1-c^2x^2\right)^{5/2}\log(1-cx)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (-4*b*d^4*(1 - c^2*x^2)^(5/2))/(3*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) - (b*d^4*(1 - c^2*x^2)^(5/2)*ArcSin[c*x]^2)/(2*c*(d + c*d*x)^(5/2)*
(f - c*f*x)^(5/2)) + (2*d^4*(1 + c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/
(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (2*d^4*(1 + c*x)*(1 - c^2*x^2)^
2*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (d^4*(1 -
c^2*x^2)^(5/2)*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(c*(d + c*d*x)^(5/2)*(f - c
*f*x)^(5/2)) - (8*b*d^4*(1 - c^2*x^2)^(5/2)*Log[1 - c*x])/(3*c*(d + c*d*x)^
(5/2)*(f - c*f*x)^(5/2))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
```

```
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 667

```
Int[((d_) + (e_.)*(x_))^2*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[e*(
d + e*x)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((p + 2)/(c*(p +
1))), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, p}, x] && EqQ[c
*d^2 + a*e^2, 0] &&  !IntegerQ[p] && LtQ[p, -1]
```

Rule 683

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m - 1)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((m +
p)/(c*(p + 1))), Int[(d + e*x)^(m - 2)*(a + c*x^2)^(p + 1), x], x] /; FreeQ
[{a, c, d, e}, x] && EqQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && In
tegerQ[2*p]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int \frac{(d+cdx)^4(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^4(1+cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2d^4(1+cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^4(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc(1-c^2x^2)^{5/2}\right)\int\left(\frac{2d^4(1+cx)^3}{3c(1-c^2x^2)^2} - \frac{2d^4(1+cx)}{c(1-c^2x^2)} + \frac{d^4\arcsin(cx)}{c\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^4(1+cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2d^4(1+cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^4(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(2bd^4(1-c^2x^2)^{5/2}\right)\int\frac{(1+cx)^3}{(1-c^2x^2)^2}dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bd^4(1-c^2x^2)^{5/2}\right)\int\frac{\arcsin(cx)}{\sqrt{1-c^2x^2}}dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(2bd^4(1-c^2x^2)^{5/2}\right)\int\frac{1+cx}{1-c^2x^2}dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bd^4(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^4(1+cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2d^4(1+cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^4(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(2bd^4(1-c^2x^2)^{5/2}\right)\int\frac{1+cx}{(1-cx)^2}dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(2bd^4(1-c^2x^2)^{5/2}\right)\int\frac{1}{1-cx}dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bd^4(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^4(1+cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2d^4(1+cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^4(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{2bd^4(1-c^2x^2)^{5/2}\log(1-cx)}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(2bd^4(1-c^2x^2)^{5/2}\right)\int\left(\frac{2}{(-1+cx)^2} + \frac{1}{-1+cx}\right)dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{4bd^4(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bd^4(1-c^2x^2)^{5/2}\arcsin(cx)^2}{2c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$
$$+ \frac{2d^4(1+cx)^3(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$
$$- \frac{2d^4(1+cx)(1-c^2x^2)^2(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$
$$+ \frac{d^4(1-c^2x^2)^{5/2}\arcsin(cx)(a+b\arcsin(cx))}{c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{8bd^4(1-c^2x^2)^{5/2}\log(1-cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

Mathematica [A] (verified)

Time = 6.75 (sec) , antiderivative size = 601, normalized size of antiderivative = 1.85

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \frac{d\left(\frac{16a(-1+2cx)\sqrt{d+cdx}\sqrt{f-cfx}}{(-1+cx)^2} - 12a\sqrt{d}\sqrt{f}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right) + \cdots\right.}{}$$

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (d*((16*a*(-1 + 2*c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(-1 + c*x)^2 - 12*a
*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt
[f]*(-1 + c^2*x^2))] + (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x
]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])
- Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcS
in[c*x]/2]]) + 2*(2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] + 2*(2 + Sqrt[1 -
 c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]
))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2])) + (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]*(-
8 - 6*ArcSin[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSi
n[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*(-(ArcSin[c*x]*(14 + 3*ArcSin[c*x])) +
 28*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(4 + 2*(2 + 7*Sqrt[1
- c^2*x^2])*ArcSin[c*x] - 3*(2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 28*(2 +
 Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSi
n[c*x]/2]))/((Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2
] + Sin[ArcSin[c*x]/2]))))/(12*c*f^3)
```

Maple [F]

$$\int \frac{(cdx+d)^{\frac{3}{2}}(a+b\arcsin(cx))}{(-cfx+f)^{\frac{5}{2}}}dx$$

[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)

[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)

Fricas [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{5}{2}}}\,dx$$

[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="fricas")

[Out] integral(-(a*c*d*x + a*d + (b*c*d*x + b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^3*f^3*x^3 - 3*c^2*f^3*x^2 + 3*c*f^3*x - f^3), x)

Sympy [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \int \frac{(d(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))}{(-f(cx-1))^{\frac{5}{2}}}\,dx$$

[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))/(-c*f*x+f)**(5/2),x)

[Out] Integral((d*(c*x + 1))**(3/2)*(a + b*asin(c*x))/(-f*(c*x - 1))**(5/2), x)

Maxima [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{5}{2}}}\,dx$$

[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="maxima")

[Out] -b*sqrt(d)*sqrt(f)*integrate((c*d*x + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^3*f^3*x^3 - 3*c^2*f^3*x^2 + 3*c*f^3*x - f^3), x) - 1/3*a*((-c^2*d*f*x^2 + d*f)^(3/2)/(c^4*f^4*x^3 - 3*c^3*f^4*x^2 + 3*c^2*f^4*x - c*f^4) - 2*sqrt(-c^2*d*f*x^2 + d*f)*d/(c^3*f^3*x^2 - 2*c^2*f^3*x + c*f^3) - 7*sqrt(-c^2*d*f*x^2 + d*f)*d/(c^2*f^3*x - c*f^3) - 3*d^2*arcsin(c*x)/(c*f^3*sqrt(d/f)))

Giac [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d+c\,d\,x)^{3/2}}{(f-c\,f\,x)^{5/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(3/2))/(f - c*f*x)^(5/2),x)
```

```
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(3/2))/(f - c*f*x)^(5/2), x)
```

3.536 $\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 164

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = -\frac{2bd^3(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^3(1+cx)^3\left(1-c^2x^2\right)\left(a+b\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bd^3(1-c^2x^2)^{5/2}\log(1-cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] -2/3*b*d^3*(-c^2*x^2+1)^(5/2)/c/(-c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+1
/3*d^3*(c*x+1)^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f
)^(5/2)-1/3*b*d^3*(-c^2*x^2+1)^(5/2)*ln(-c*x+1)/c/(c*d*x+d)^(5/2)/(-c*f*x+f
)^(5/2)
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {4763, 665, 4845, 12, 641, 45}

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \frac{d^3(cx+1)^3\left(1-c^2x^2\right)\left(a+b\arcsin(cx)\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{2bd^3(1-c^2x^2)^{5/2}}{3c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{bd^3(1-c^2x^2)^{5/2}\log(1-cx)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (-2*b*d^3*(1 - c^2*x^2)^(5/2))/(3*c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) + (d^3*(1 + c*x)^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d
```

```
*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*d^3*(1 - c^2*x^2)^(5/2)*Log[1 - c*x])/(3*
c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 665

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^m*((a + c*x^2)^(p + 1)/(2*c*d*(p + 1))), x] /; FreeQ[{a, c, d,
e, m, p}, x] && EqQ[c*d^2 + a*e^2, 0] &&  !IntegerQ[p] && EqQ[m + 2*p + 2,
0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\text{integral} = \frac{\left(1-c^2x^2\right)^{5/2}\int \frac{(d+cdx)^3(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d^3(1+cx)^3\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc\left(1-c^2x^2\right)^{5/2}\right)\int \frac{d^3(1+cx)^3}{3c(1-c^2x^2)^2}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d^3(1+cx)^3\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bd^3\left(1-c^2x^2\right)^{5/2}\right)\int \frac{(1+cx)^3}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d^3(1+cx)^3\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bd^3\left(1-c^2x^2\right)^{5/2}\right)\int \frac{1+cx}{(1-cx)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d^3(1+cx)^3\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bd^3\left(1-c^2x^2\right)^{5/2}\right)\int \left(\frac{2}{(-1+cx)^2}+\frac{1}{-1+cx}\right)dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{2bd^3\left(1-c^2x^2\right)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^3(1+cx)^3\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bd^3\left(1-c^2x^2\right)^{5/2}\log(1-cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

Mathematica [A] (verified)

Time = 1.48 (sec) , antiderivative size = 126, normalized size of antiderivative = 0.77

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \frac{\sqrt{d+cdx}\sqrt{f-cfx}\left((1+cx)\left(-b+bcx+a\sqrt{1-c^2x^2}\right)+b(1+cx)\sqrt{1-\right.}{3cf^3(-1+cx)^2\sqrt{1-c^2x^2}}$$

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x]))/(f - c*f*x)^(5/2),x]
```

```
[Out] (Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*((1 + c*x)*(-b + b*c*x + a*Sqrt[1 - c^2*x^
2]) + b*(1 + c*x)*Sqrt[1 - c^2*x^2]*ArcSin[c*x] - b*(-1 + c*x)^2*Log[f - c*
f*x]))/(3*c*f^3*(-1 + c*x)^2*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int \frac{\sqrt{cdx+d}\,(a+b\arcsin(cx))}{(-cfx+f)^{\frac{5}{2}}}dx$$

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 520, normalized size of antiderivative = 3.17

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \left[\frac{(bc^3fx^3-bc^2fx^2-bcfx+bf)\sqrt{\frac{d}{f}}\log\left(\frac{c^6dx^6-4\,c^5dx^5+5\,c^4dx^4-4\,c^2dx^2+4\,cd\cdots}{\cdots}\right.}{\cdots}\right.$$

$$-\frac{(bc^3fx^3-bc^2fx^2-bcfx+bf)\sqrt{-\frac{d}{f}}\arctan\left(\frac{(c^2x^2-2\,cx+2)\sqrt{-c^2x^2+1}\sqrt{cdx+d}\sqrt{-cfx+f}\sqrt{-\frac{d}{f}}}{c^4dx^4-2\,c^3dx^3-c^2dx^2+2\,cdx}\right)-\left(ac^2x^2-2\sqrt{-c\cdots}\right.}{3\left(c^4f^3x^3-c^3f^3x^2-c^2f^3x+c\cdots\right.}$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] [1/6*((b*c^3*f*x^3 - b*c^2*f*x^2 - b*c*f*x + b*f)*sqrt(d/f)*log((c^6*d*x^6
- 4*c^5*d*x^5 + 5*c^4*d*x^4 - 4*c^2*d*x^2 + 4*c*d*x + (c^4*x^4 - 4*c^3*x^3
+ 6*c^2*x^2 - 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sq
rt(d/f) - 2*d)/(c^4*x^4 - 2*c^3*x^3 + 2*c*x - 1)) + 2*(a*c^2*x^2 - 2*sqrt(-
c^2*x^2 + 1)*b*c*x + 2*a*c*x + (b*c^2*x^2 + 2*b*c*x + b)*arcsin(c*x) + a)*s
qrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*f^3*x^3 - c^3*f^3*x^2 - c^2*f^3*x + c
*f^3), -1/3*((b*c^3*f*x^3 - b*c^2*f*x^2 - b*c*f*x + b*f)*sqrt(-d/f)*arctan(
(c^2*x^2 - 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*s
qrt(-d/f)/(c^4*d*x^4 - 2*c^3*d*x^3 - c^2*d*x^2 + 2*c*d*x)) - (a*c^2*x^2 - 2
*sqrt(-c^2*x^2 + 1)*b*c*x + 2*a*c*x + (b*c^2*x^2 + 2*b*c*x + b)*arcsin(c*x)
 + a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*f^3*x^3 - c^3*f^3*x^2 - c^2*f^
3*x + c*f^3)]
```

Sympy [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \int \frac{\sqrt{d(cx+1)}(a+b\operatorname{asin}(cx))}{(-f(cx-1))^{\frac{5}{2}}}\,dx$$

[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))/(-c*f*x+f)**(5/2),x)

[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))/(-f*(c*x - 1))**(5/2), x)

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.32

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \frac{1}{3}bc\left(\frac{2\sqrt{d}}{c^3f^{\frac{5}{2}}x-c^2f^{\frac{5}{2}}}-\frac{\sqrt{d}\log(cx-1)}{c^2f^{\frac{5}{2}}}\right) + \frac{1}{3}b\left(\frac{2\sqrt{-c^2dfx^2+df}}{c^3f^3x^2-2c^2f^3x+cf^3}+\frac{\sqrt{-c^2dfx^2+df}}{c^2f^3x-cf^3}\right)\arcsin(cx) + \frac{1}{3}a\left(\frac{2\sqrt{-c^2dfx^2+df}}{c^3f^3x^2-2c^2f^3x+cf^3}+\frac{\sqrt{-c^2dfx^2+df}}{c^2f^3x-cf^3}\right)$$

[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="maxima")

[Out] 1/3*b*c*(2*sqrt(d)/(c^3*f^(5/2)*x - c^2*f^(5/2)) - sqrt(d)*log(c*x - 1)/(c^2*f^(5/2))) + 1/3*b*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^3*f^3*x^2 - 2*c^2*f^3*x + c*f^3) + sqrt(-c^2*d*f*x^2 + d*f)/(c^2*f^3*x - c*f^3))*arcsin(c*x) + 1/3*a*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^3*f^3*x^2 - 2*c^2*f^3*x + c*f^3) + sqrt(-c^2*d*f*x^2 + d*f)/(c^2*f^3*x - c*f^3))

Giac [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \int \frac{\sqrt{cdx+d}(b\arcsin(cx)+a)}{(-cfx+f)^{\frac{5}{2}}}\,dx$$

[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/(-c*f*x+f)^(5/2),x, algorithm="giac")

[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)/(-c*f*x + f)^(5/2), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{(f-cfx)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d+c\,d\,x}}{(f-c\,f\,x)^{5/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + c*d*x)^(1/2))/(f - c*f*x)^(5/2),x)
[Out] int(((a + b*asin(c*x))*(d + c*d*x)^(1/2))/(f - c*f*x)^(5/2), x)
```

3.537 $\int \frac{a+b \arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 265

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx = -\frac{bd^2(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2d^2(1+cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bd^2(1-c^2x^2)^{5/2}\operatorname{arctanh}(cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bd^2(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] -1/3*b*d^2*(-c^2*x^2+1)^(5/2)/c/(-c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+2
/3*d^2*(c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^
(5/2)+1/3*d^2*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)
^(5/2)-1/3*b*d^2*(-c^2*x^2+1)^(5/2)*arctanh(c*x)/c/(c*d*x+d)^(5/2)/(-c*f*x+
f)^(5/2)+1/6*b*d^2*(-c^2*x^2+1)^(5/2)*ln(-c^2*x^2+1)/c/(c*d*x+d)^(5/2)/(-c*
f*x+f)^(5/2)
```

Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 265, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4763, 667, 197, 4845, 641, 46, 213, 266}

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx = \frac{d^2x(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(cdx+d)^{5/2}(f-cfx)^{5/2}} + \frac{2d^2(cx+1)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{bd^2(1-c^2x^2)^{5/2}\operatorname{arctanh}(cx)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{bd^2(1-c^2x^2)^{5/2}}{3c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}} + \frac{bd^2(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{6c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)),x]
```

```
[Out] -1/3*(b*d^2*(1 - c^2*x^2)^(5/2))/(c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) + (2*d^2*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d
*x)^(5/2)*(f - c*f*x)^(5/2)) + (d^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/
(3*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*d^2*(1 - c^2*x^2)^(5/2)*ArcTan
h[c*x])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*d^2*(1 - c^2*x^2)^(5
/2)*Log[1 - c^2*x^2])/(6*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 667

```
Int[((d_) + (e_.)*(x_))^2*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[e*(
d + e*x)*((a + c*x^2)^(p + 1)/(c*(p + 1))), x] - Dist[e^2*((p + 2)/(c*(p +
1))), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, p}, x] && EqQ[c
*d^2 + a*e^2, 0] &&  !IntegerQ[p] && LtQ[p, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int \frac{(d+cdx)^2(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^2(1+cx)\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc(1-c^2x^2)^{5/2}\right)\int\left(\frac{2d^2(1+cx)}{3c(1-c^2x^2)^2}+\frac{d^2x}{3(1-c^2x^2)}\right)dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^2(1+cx)\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(2bd^2(1-c^2x^2)^{5/2}\right)\int \frac{1+cx}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bcd^2(1-c^2x^2)^{5/2}\right)\int \frac{x}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^2(1+cx)\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bd^2(1-c^2x^2)^{5/2}\log(1-c^2x^2)}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(2bd^2(1-c^2x^2)^{5/2}\right)\int \frac{1}{(1-cx)^2(1+cx)}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{2d^2(1+cx)\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bd^2(1-c^2x^2)^{5/2}\log(1-c^2x^2)}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(2bd^2(1-c^2x^2)^{5/2}\right)\int\left(\frac{1}{2(-1+cx)^2}-\frac{1}{2(-1+c^2x^2)}\right)dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$
\begin{aligned}
&= -\frac{bd^2(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad + \frac{2d^2(1+cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad + \frac{bd^2(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bd^2(1-c^2x^2)^{5/2}\right)\int\frac{1}{-1+c^2x^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&= -\frac{bd^2(1-c^2x^2)^{5/2}}{3c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad + \frac{2d^2(1+cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d^2x(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} \\
&\quad - \frac{bd^2(1-c^2x^2)^{5/2}\,\mathrm{arctanh}(cx)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bd^2(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.04 (sec) , antiderivative size = 130, normalized size of antiderivative = 0.49

$$
\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx = \frac{\sqrt{d+cdx}\sqrt{f-cfx}\left(-\left((-2+cx)\left(-b+bcx+a\sqrt{1-c^2x^2}\right)\right)-b(-2+cx)\right.}{3cdf^3(-1+cx)^2\sqrt{1-c^2x^2}}
$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-((-2 + c*x)*(-b + b*c*x + a*Sqrt[1 - c^2
*x^2])) - b*(-2 + c*x)*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + b*(-1 + c*x)^2*Log[f
 - c*f*x]))/(3*c*d*f^3*(-1 + c*x)^2*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$
\int \frac{a+b\arcsin(cx)}{\sqrt{cdx+d}\,(-cfx+f)^{\frac{5}{2}}}dx
$$

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.34 (sec) , antiderivative size = 527, normalized size of antiderivative = 1.99

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx = \left[\frac{(bc^3x^3-bc^2x^2-bcx+b)\sqrt{df}\log\left(\frac{c^6dfx^6-4\,c^5dfx^5+5\,c^4dfx^4-4\,c^2dfx^2+4\,cdfx-(c^4x^4-4\cdots}{c^4x^4-2\cdots}\right.}{}\right.$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] [1/6*((b*c^3*x^3 - b*c^2*x^2 - b*c*x + b)*sqrt(d*f)*log((c^6*d*f*x^6 - 4*c^
5*d*f*x^5 + 5*c^4*d*f*x^4 - 4*c^2*d*f*x^2 + 4*c*d*f*x - (c^4*x^4 - 4*c^3*x^
3 + 6*c^2*x^2 - 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*
sqrt(d*f) - 2*d*f)/(c^4*x^4 - 2*c^3*x^3 + 2*c*x - 1)) - 2*(a*c^2*x^2 + sqrt
(-c^2*x^2 + 1)*b*c*x - a*c*x + (b*c^2*x^2 - b*c*x - 2*b)*arcsin(c*x) - 2*a)
*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d*f^3*x^3 - c^3*d*f^3*x^2 - c^2*d*f
^3*x + c*d*f^3), 1/3*((b*c^3*x^3 - b*c^2*x^2 - b*c*x + b)*sqrt(-d*f)*arctan
((c^2*x^2 - 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*
sqrt(-d*f)/(c^4*d*f*x^4 - 2*c^3*d*f*x^3 - c^2*d*f*x^2 + 2*c*d*f*x)) - (a*c^
2*x^2 + sqrt(-c^2*x^2 + 1)*b*c*x - a*c*x + (b*c^2*x^2 - b*c*x - 2*b)*arcsin
(c*x) - 2*a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d*f^3*x^3 - c^3*d*f^3*x
^2 - c^2*d*f^3*x + c*d*f^3)]
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx = \int \frac{a+b\operatorname{asin}(cx)}{\sqrt{d\,(cx+1)}\,(-f\,(cx-1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(1/2)/(-c*f*x+f)**(5/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(sqrt(d*(c*x + 1))*(-f*(c*x - 1))**(5/2)), x)
```

Maxima [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 227, normalized size of antiderivative = 0.86

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx &= \frac{1}{3}\,bc\left(\frac{1}{c^3\sqrt{d}f^{\frac{5}{2}}x-c^2\sqrt{d}f^{\frac{5}{2}}}+\frac{\log(cx-1)}{c^2\sqrt{d}f^{\frac{5}{2}}}\right)\\&\quad+\frac{1}{3}\,b\left(\frac{\sqrt{-c^2dfx^2+df}}{c^3df^3x^2-2\,c^2df^3x+cdf^3}-\frac{\sqrt{-c^2dfx^2+df}}{c^2df^3x-cdf^3}\right)\arcsin(cx)\\&\quad+\frac{1}{3}\,a\left(\frac{\sqrt{-c^2dfx^2+df}}{c^3df^3x^2-2\,c^2df^3x+cdf^3}-\frac{\sqrt{-c^2dfx^2+df}}{c^2df^3x-cdf^3}\right)\end{aligned}$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] 1/3*b*c*(1/(c^3*sqrt(d)*f^(5/2)*x - c^2*sqrt(d)*f^(5/2)) + log(c*x - 1)/(c^
2*sqrt(d)*f^(5/2))) + 1/3*b*(sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d*f^3*x^2 - 2*c^
2*d*f^3*x + c*d*f^3) - sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d*f^3*x - c*d*f^3))*ar
csin(c*x) + 1/3*a*(sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d*f^3*x^2 - 2*c^2*d*f^3*x
+ c*d*f^3) - sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d*f^3*x - c*d*f^3))
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\sqrt{cdx+d}(-cfx+f)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(sqrt(c*d*x + d)*(-c*f*x + f)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{\sqrt{d+c\,d\,x}\,{\left(f-c\,f\,x\right)}^{5/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(5/2)), x)
```

3.538 $\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 255

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = -\frac{bd(1-c^2x^2)^{5/2}}{6c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d(1+cx)\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bd(1-c^2x^2)^{5/2}\operatorname{arctanh}(cx)}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bd(1-c^2x^2)^{5/2}\log(1-c^2x^2)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] -1/6*b*d*(-c^2*x^2+1)^(5/2)/c/(-c*x+1)/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+1/3
*d*(c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2
)+2/3*d*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
-1/6*b*d*(-c^2*x^2+1)^(5/2)*arctanh(c*x)/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
+1/3*b*d*(-c^2*x^2+1)^(5/2)*ln(-c^2*x^2+1)/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/
2)
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 255, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {4763, 653, 197, 4845, 641, 46, 213, 266}

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = \frac{2dx(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(cdx+d)^{5/2}(f-cfx)^{5/2}} + \frac{d(cx+1)\,(1-c^2x^2)\,(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{bd(1-c^2x^2)^{5/2}\operatorname{arctanh}(cx)}{6c(cdx+d)^{5/2}(f-cfx)^{5/2}} - \frac{bd(1-c^2x^2)^{5/2}}{6c(1-cx)(cdx+d)^{5/2}(f-cfx)^{5/2}} + \frac{bd(1-c^2x^2)^{5/2}\log(1-c^2x^2)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)),x]
```

```
[Out] -1/6*(b*d*(1 - c^2*x^2)^(5/2))/(c*(1 - c*x)*(d + c*d*x)^(5/2)*(f - c*f*x)^(
5/2)) + (d*(1 + c*x)*(1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5
/2)*(f - c*f*x)^(5/2)) + (2*d*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3*(d
+ c*d*x)^(5/2)*(f - c*f*x)^(5/2)) - (b*d*(1 - c^2*x^2)^(5/2)*ArcTanh[c*x])/
(6*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (b*d*(1 - c^2*x^2)^(5/2)*Log[1
- c^2*x^2])/(3*c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 641

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c/e)*x)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 653

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[((a*e
 - c*d*x)/(2*a*c*(p + 1)))*(a + c*x^2)^(p + 1), x] + Dist[d*((2*p + 3)/(2*a
*(p + 1))), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e}, x] && Lt
Q[p, -1] && NeQ[p, -3/2]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4845

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Dist[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[Dist[1/Sqrt[1 - c^2*x^2
], u, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] &
& IGtQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m
, 3])
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int \frac{(d+cdx)(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d(1+cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc(1-c^2x^2)^{5/2}\right)\int\left(\frac{d(1+cx)}{3c(1-c^2x^2)^2}+\frac{2dx}{3(1-c^2x^2)}\right)dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d(1+cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bd(1-c^2x^2)^{5/2}\right)\int\frac{1+cx}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(2bcd(1-c^2x^2)^{5/2}\right)\int\frac{x}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d(1+cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bd(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bd(1-c^2x^2)^{5/2}\right)\int\frac{1}{(1-cx)^2(1+cx)}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{d(1+cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bd(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bd(1-c^2x^2)^{5/2}\right)\int\left(\frac{1}{2(-1+cx)^2}-\frac{1}{2(-1+c^2x^2)}\right)dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bd(1-c^2x^2)^{5/2}}{6c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d(1+cx)(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx(1-c^2x^2)^2(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bd(1-c^2x^2)^{5/2}\log(1-c^2x^2)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(bd(1-c^2x^2)^{5/2}\right)\int \frac{1}{-1+c^2x^2}\,dx}{6(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{bd(1-c^2x^2)^{5/2}}{6c(1-cx)(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{d(1+cx)(1-c^2x^2)(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2dx(1-c^2x^2)^2(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{bd(1-c^2x^2)^{5/2}\operatorname{arctanh}(cx)}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{bd(1-c^2x^2)^{5/2}\log(1-c^2x^2)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

Mathematica [A] (verified)

Time = 1.71 (sec) , antiderivative size = 184, normalized size of antiderivative = 0.72

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = \frac{\sqrt{d+cdx}\left(-4a-8acx+8ac^2x^2+2b\sqrt{1-c^2x^2}+4b(-1-2cx+2c^2x^2)\right)}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*(-4*a - 8*a*c*x + 8*a*c^2*x^2 + 2*b*Sqrt[1 - c^2*x^2] + 4*
b*(-1 - 2*c*x + 2*c^2*x^2)*ArcSin[c*x] + 3*b*(-1 + c*x)*Sqrt[1 - c^2*x^2]*L
og[-(f*(1 + c*x))] - 5*b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x] + 5*b*c*x*Sqrt[1
- c^2*x^2]*Log[f - c*f*x]))/(12*c*d^2*f^2*Sqrt[f - c*f*x]*(-1 + c^2*x^2))
```

Maple [F]

$$\int \frac{a+b\arcsin(cx)}{(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x)
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = \int \frac{b\arcsin(cx)+a}{(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^5*d^2*f^3
*x^5 - c^4*d^2*f^3*x^4 - 2*c^3*d^2*f^3*x^3 + 2*c^2*d^2*f^3*x^2 + c*d^2*f^3*
x - d^2*f^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(3/2)/(-c*f*x+f)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 237, normalized size of antiderivative = 0.93

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = \frac{1}{12}\,bc\left(\frac{2\,\sqrt{d}\sqrt{f}}{c^3d^2f^3x-c^2d^2f^3}+\frac{3\,\log\left(cx+1\right)}{c^2d^{\frac{3}{2}}f^{\frac{5}{2}}}+\frac{5\,\log\left(cx-1\right)}{c^2d^{\frac{3}{2}}f^{\frac{5}{2}}}\right) - \frac{1}{3}\,b\left(\frac{1}{\sqrt{-c^2dfx^2+df}\,c^2df^2x-\sqrt{-c^2dfx^2+df}\,cdf^2}-\frac{2\,x}{\sqrt{-c^2dfx^2+df}\,df^2}\right)\arcsin\left(cx\right) - \frac{1}{3}\,a\left(\frac{1}{\sqrt{-c^2dfx^2+df}\,c^2df^2x-\sqrt{-c^2dfx^2+df}\,cdf^2}-\frac{2\,x}{\sqrt{-c^2dfx^2+df}\,df^2}\right)$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] 1/12*b*c*(2*sqrt(d)*sqrt(f)/(c^3*d^2*f^3*x - c^2*d^2*f^3) + 3*log(c*x + 1)/
(c^2*d^(3/2)*f^(5/2)) + 5*log(c*x - 1)/(c^2*d^(3/2)*f^(5/2))) - 1/3*b*(1/(s
qrt(-c^2*d*f*x^2 + d*f)*c^2*d*f^2*x - sqrt(-c^2*d*f*x^2 + d*f)*c*d*f^2) - 2
*x/(sqrt(-c^2*d*f*x^2 + d*f)*d*f^2))*arcsin(c*x) - 1/3*a*(1/(sqrt(-c^2*d*f*
x^2 + d*f)*c^2*d*f^2*x - sqrt(-c^2*d*f*x^2 + d*f)*c*d*f^2) - 2*x/(sqrt(-c^2
*d*f*x^2 + d*f)*d*f^2))
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = \int \frac{b\arcsin(cx)+a}{(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(3/2)*(-c*f*x + f)^(5/2)), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{(d+c\,d\,x)^{3/2}\,(f-c\,f\,x)^{5/2}}\,dx$$

[In] int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)),x)

[Out] int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)), x)

3.539 $\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 188

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx = -\frac{b(1-c^2x^2)^{3/2}}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{x(1-c^2x^2)\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{2x(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}+\frac{b(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

```
[Out] -1/6*b*(-c^2*x^2+1)^(3/2)/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+1/3*x*(-c^2*x^
2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+2/3*x*(-c^2*x^2+1)^
2*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)+1/3*b*(-c^2*x^2+1)^(5/
2)*ln(-c^2*x^2+1)/c/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4763, 4747, 4745, 266, 267}

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx = \frac{2x(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{x(1-c^2x^2)\,(a+b\arcsin(cx))}{3(cdx+d)^{5/2}(f-cfx)^{5/2}}-\frac{b(1-c^2x^2)^{3/2}}{6c(cdx+d)^{5/2}(f-cfx)^{5/2}}+\frac{b(1-c^2x^2)^{5/2}\log\left(1-c^2x^2\right)}{3c(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)),x]
```

```
[Out] -1/6*(b*(1 - c^2*x^2)^(3/2))/(c*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) + (x*(
1 - c^2*x^2)*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)) +
 (2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2)) + (b*(1 - c^2*x^2)^(5/2)*Log[1 - c^2*x^2])/(3*c*(d + c*d*x)^(5/2)*(
f - c*f*x)^(5/2))
```

Rule 266

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2} \int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{\left(2(1-c^2x^2)^{5/2}\right)\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(bc(1-c^2x^2)^{5/2}\right)\int \frac{x}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{b(1-c^2x^2)^{3/2}}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2x(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} - \frac{\left(2bc(1-c^2x^2)^{5/2}\right)\int \frac{x}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

$$= -\frac{b(1-c^2x^2)^{3/2}}{6c(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{2x(1-c^2x^2)^2\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(f-cfx)^{5/2}} + \frac{b(1-c^2x^2)^{5/2}\log(1-c^2x^2)}{3c(d+cdx)^{5/2}(f-cfx)^{5/2}}$$

Mathematica [A] (verified)

Time = 1.24 (sec) , antiderivative size = 178, normalized size of antiderivative = 0.95

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx = \frac{\sqrt{d+cdx}\Big(-6acx+4ac^3x^3+b\sqrt{1-c^2x^2}+2bcx(-3+2c^2x^2)\arcsin(cx)-}{6cd^3(-}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*(-6*a*c*x + 4*a*c^3*x^3 + b*Sqrt[1 - c^2*x^2] + 2*b*c*x*(-
3 + 2*c^2*x^2)*ArcSin[c*x] - 2*b*(1 - c^2*x^2)^(3/2)*Log[-(f*(1 + c*x))] -
2*b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x] + 2*b*c^2*x^2*Sqrt[1 - c^2*x^2]*Log[f
- c*f*x]))/(6*c*d^3*(-1 + c*x)*Sqrt[f - c*f*x]*(f + c*f*x)^2)
```

Maple [F]

$$\int \frac{a+b\arcsin(cx)}{(cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{5}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x)
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx = \int \frac{b\arcsin(cx)+a}{(cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x, algorithm="
fricas")
```

```
[Out] integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^6*d^3*f^3
*x^6 - 3*c^4*d^3*f^3*x^4 + 3*c^2*d^3*f^3*x^2 - d^3*f^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*asin(c*x))/(c*d*x+d)**(5/2)/(-c*f*x+f)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 177, normalized size of antiderivative = 0.94

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx &= \frac{1}{6}\,bc\left(\frac{1}{c^4d^{\frac{5}{2}}f^{\frac{5}{2}}x^2-c^2d^{\frac{5}{2}}f^{\frac{5}{2}}}+\frac{2\,\log(cx+1)}{c^2d^{\frac{5}{2}}f^{\frac{5}{2}}}+\frac{2\,\log(cx-1)}{c^2d^{\frac{5}{2}}f^{\frac{5}{2}}}\right)\\ &+\frac{1}{3}\,b\left(\frac{x}{(-c^2dfx^2+df)^{\frac{3}{2}}df}+\frac{2\,x}{\sqrt{-c^2dfx^2+df}\,d^2f^2}\right)\arcsin(cx)\\ &+\frac{1}{3}\,a\left(\frac{x}{(-c^2dfx^2+df)^{\frac{3}{2}}df}+\frac{2\,x}{\sqrt{-c^2dfx^2+df}\,d^2f^2}\right)\end{aligned}$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x, algorithm="
maxima")
```

```
[Out] 1/6*b*c*(1/(c^4*d^(5/2)*f^(5/2)*x^2 - c^2*d^(5/2)*f^(5/2)) + 2*log(c*x + 1)
/(c^2*d^(5/2)*f^(5/2)) + 2*log(c*x - 1)/(c^2*d^(5/2)*f^(5/2))) + 1/3*b*(x/(
(-c^2*d*f*x^2 + d*f)^(3/2)*d*f) + 2*x/(sqrt(-c^2*d*f*x^2 + d*f)*d^2*f^2))*a
rcsin(c*x) + 1/3*a*(x/((-c^2*d*f*x^2 + d*f)^(3/2)*d*f) + 2*x/(sqrt(-c^2*d*f
*x^2 + d*f)*d^2*f^2))
```

Giac [F]

$$\int \frac{a + b \arcsin(cx)}{(d + cdx)^{5/2}(f - cfx)^{5/2}} \, dx = \int \frac{b \arcsin(cx) + a}{(cdx + d)^{\frac{5}{2}}(-cfx + f)^{\frac{5}{2}}} \, dx$$

```
[In] integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x, algorithm="
giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(5/2)*(-c*f*x + f)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(cx)}{(d + cdx)^{5/2}(f - cfx)^{5/2}} \, dx = \int \frac{a + b \operatorname{asin}(c\,x)}{(d + c\,d\,x)^{5/2}\,(f - c\,f\,x)^{5/2}} \, dx$$

```
[In] int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)), x)
```

3.540 $\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 613

$$\begin{aligned}\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx &= \frac{8b^2d^2\sqrt{d+cdx}\sqrt{e-cex}}{9c}\\
&-\frac{15}{64}b^2d^2x\sqrt{d+cdx}\sqrt{e-cex}-\frac{1}{32}b^2c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}\\
&+\frac{4b^2d^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{27c}+\frac{15b^2d^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{64c\sqrt{1-c^2x^2}}\\
&+\frac{4bd^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}\\
&-\frac{3bcd^2x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}\\
&-\frac{4bc^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}\\
&-\frac{bc^3d^2x^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}\\
&+\frac{3}{8}d^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\\
&+\frac{1}{4}c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\\
&-\frac{2d^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c}\\
&+\frac{5d^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] 8/9*b^2*d^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c-15/64*b^2*d^2*x*(c*d*x+d)^(1
/2)*(-c*e*x+e)^(1/2)-1/32*b^2*c^2*d^2*x^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+
4/27*b^2*d^2*(-c^2*x^2+1)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+3/8*d^2*x*(a+b
```

```
*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+1/4*c^2*d^2*x^3*(a+b*arcsi
n(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)-2/3*d^2*(-c^2*x^2+1)*(a+b*arcsin
(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+15/64*b^2*d^2*arcsin(c*x)*(c*d*
x+d)^(1/2)*(-c*e*x+e)^(1/2)/c/(-c^2*x^2+1)^(1/2)+4/3*b*d^2*x*(a+b*arcsin(c*
x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-3/8*b*c*d^2*x^2*(a+
b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-4/9*b*c^
2*d^2*x^3*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(
1/2)-1/8*b*c^3*d^2*x^4*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(
-c^2*x^2+1)^(1/2)+5/24*d^2*(a+b*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(
1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.68 (sec) , antiderivative size = 613, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {4763, 4847, 4741, 4737, 4723, 327, 222, 4767, 4739, 455, 45, 4783, 4795}

$$\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \frac{1}{4}c^2d^2x^3\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2 - \frac{3bcd^2x^2\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{4bd^2x\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} + \frac{5d^2\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc\sqrt{1-c^2x^2}} - \frac{2d^2(1-c^2x^2)\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2}{3c} - \frac{4bc^2d^2x^3\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} - \frac{bc^3d^2x^4\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{3}{8}d^2x\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{15b^2d^2\arcsin(cx)\sqrt{cdx+d}\sqrt{e-cex}}{64c\sqrt{1-c^2x^2}} - \frac{1}{32}b^2c^2d^2x^3\sqrt{cdx+d}\sqrt{e-cex} + \frac{4b^2d^2(1-c^2x^2)\sqrt{cdx+d}\sqrt{e-cex}}{27c} - \frac{15}{64}b^2d^2x\sqrt{cdx+d}\sqrt{e-cex} + \frac{8b^2d^2\sqrt{cdx+d}\sqrt{e-cex}}{9c}$$

```
[In] Int[(d + c*d*x)^(5/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (8*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (15*b^2*d^2*x*Sqrt[d +
c*d*x]*Sqrt[e - c*e*x])/64 - (b^2*c^2*d^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*
```

```
x])/32 + (4*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2))/(27*c) +
 (15*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(64*c*Sqrt[1 - c^
2*x^2]) + (4*b*d^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(
3*Sqrt[1 - c^2*x^2]) - (3*b*c*d^2*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a +
b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) - (4*b*c^2*d^2*x^3*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*d^2*x^4*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) +
 (3*d^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/8 + (c^2*d
^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/4 - (2*d^2*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) +
(5*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(24*b*c*Sqrt[
1 - c^2*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
```

```
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\text{integral} = \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int (d+cdx)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \left(d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+2cd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+c\right.}{\sqrt{1-c^2x^2}}$$

$$= \frac{\left(d^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(2cd^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} + \frac{\left(c^2d^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{1}{2}d^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{4}c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad - \frac{2d^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{3c} \\
&\quad + \frac{\left(d^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(4bd^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int (1-c^2x^2)(a+b\arcsin(cx))\,dx}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bcd^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int x(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(c^2d^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bc^3d^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int x^3(a+b\arcsin(cx))\,dx}{2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{4bd^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcd^2x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&\quad - \frac{4bc^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^3d^2x^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&\quad + \frac{3}{8}d^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{4}c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad - \frac{2d^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c} \\
&\quad + \frac{d^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(d^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(bcd^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int x(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(4b^2cd^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(b^2c^2d^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(b^2c^4d^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{1}{4}b^2d^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{1}{32}b^2c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex} \\
&+ \frac{4bd^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&- \frac{3bcd^2x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&- \frac{4bc^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&- \frac{bc^3d^2x^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&+ \frac{3}{8}d^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+ \frac{1}{4}c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&- \frac{2d^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c} \\
&+ \frac{5d^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc\sqrt{1-c^2x^2}} \\
&+ \frac{\left(b^2d^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} \\
&- \frac{\left(2b^2cd^2\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}\left(\int \frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx, x, x^2\right)}{3\sqrt{1-c^2x^2}} \\
&+ \frac{\left(3b^2c^2d^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{32\sqrt{1-c^2x^2}} \\
&- \frac{\left(b^2c^2d^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{15}{64}b^2d^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{1}{32}b^2c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}$$
$$+ \frac{b^2d^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} + \frac{4bd^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}$$
$$- \frac{3bcd^2x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}$$
$$- \frac{4bc^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}$$
$$- \frac{bc^3d^2x^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}$$
$$+ \frac{3}{8}d^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2$$
$$+ \frac{1}{4}c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2$$
$$- \frac{2d^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c}$$
$$+ \frac{5d^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(3b^2d^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{64\sqrt{1-c^2x^2}}$$
$$- \frac{\left(b^2d^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}}$$
$$- \frac{\left(2b^2cd^2\sqrt{d+cdx}\sqrt{e-cex}\right)\mathrm{Subst}\left(\int\left(\frac{2}{3\sqrt{1-c^2x}}+\frac{1}{3}\sqrt{1-c^2x}\right)\,dx, x, x^2\right)}{3\sqrt{1-c^2x^2}}$$

$$= \frac{8b^2d^2\sqrt{d+cdx}\sqrt{e-cex}}{9c} - \frac{15}{64}b^2d^2x\sqrt{d+cdx}\sqrt{e-cex}$$
$$- \frac{1}{32}b^2c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex} + \frac{4b^2d^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{27c}$$
$$+ \frac{15b^2d^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{64c\sqrt{1-c^2x^2}}$$
$$+ \frac{4bd^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}$$
$$- \frac{3bcd^2x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}$$
$$- \frac{4bc^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}$$
$$- \frac{bc^3d^2x^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}$$
$$+ \frac{3}{8}d^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2$$
$$+ \frac{1}{4}c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2$$
$$- \frac{2d^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{3c}$$
$$+ \frac{5d^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 3.77 (sec) , antiderivative size = 555, normalized size of antiderivative = 0.91

$$\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \frac{1440b^2d^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 4320a^2d^{5/2}\sqrt{e}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-c}}{\sqrt{d}\sqrt{e}(-1+c^2x^2}\right.}{}$$

```
[In] Integrate[(d + c*d*x)^(5/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (1440*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 4320*a^2*d^(5
/2)*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/
(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 12*b*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*ArcSin[c*x]*(576*b*c*x - 768*a*Sqrt[1 - c^2*x^2] + 768*a*c^2*x^2*Sqrt[1 -
 c^2*x^2] + 144*b*Cos[2*ArcSin[c*x]] - 9*b*Cos[4*ArcSin[c*x]] + 288*a*Sin[2
*ArcSin[c*x]] + 64*b*Sin[3*ArcSin[c*x]] - 36*a*Sin[4*ArcSin[c*x]]) - 72*b*d
^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(-60*a + 48*b*Sqrt[1 - c^2
*x^2] + 16*b*Cos[3*ArcSin[c*x]] - 24*b*Sin[2*ArcSin[c*x]] + 3*b*Sin[4*ArcSi
n[c*x]]) + d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1728*a*b*Cos[2*ArcSin[c*x]]
```

```
 + 256*b^2*Cos[3*ArcSin[c*x]] + 3*(3072*a*b*c*x - 1024*a*b*c^3*x^3 - 1536*a
^2*Sqrt[1 - c^2*x^2] + 2304*b^2*Sqrt[1 - c^2*x^2] + 864*a^2*c*x*Sqrt[1 - c^
2*x^2] + 1536*a^2*c^2*x^2*Sqrt[1 - c^2*x^2] + 576*a^2*c^3*x^3*Sqrt[1 - c^2*
x^2] - 36*a*b*Cos[4*ArcSin[c*x]] - 288*b^2*Sin[2*ArcSin[c*x]] + 9*b^2*Sin[4
*ArcSin[c*x]])))/(6912*c*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int (cdx+d)^{\frac{5}{2}} (a+b\arcsin(cx))^2 \sqrt{-cex+e}dx$$

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x)
```

Fricas [F]

$$\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{5}{2}}\sqrt{-cex+e}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral((a^2*c^2*d^2*x^2 + 2*a^2*c*d^2*x + a^2*d^2 + (b^2*c^2*d^2*x^2 + 2*
b^2*c*d^2*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x +
 a*b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))**2*(-c*e*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{5}{2}}\sqrt{-cex+e}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{5/2}\,\sqrt{e-c\,e\,x}\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(1/2), x)
```

3.541 $\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 455

$$\begin{aligned}\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx &= \frac{4b^2d\sqrt{d+cdx}\sqrt{e-cex}}{9c}\\
&-\frac{1}{4}b^2dx\sqrt{d+cdx}\sqrt{e-cex}+\frac{2b^2d\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{27c}\\
&+\frac{b^2d\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}}+\frac{2bdx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}\\
&-\frac{bcdx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}\\
&-\frac{2bc^2dx^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}\\
&+\frac{1}{2}dx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\\
&-\frac{d\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c}\\
&+\frac{d\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] 4/9*b^2*d*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c-1/4*b^2*d*x*(c*d*x+d)^(1/2)*(-
c*e*x+e)^(1/2)+2/27*b^2*d*(-c^2*x^2+1)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+1
/2*d*x*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)-1/3*d*(-c^2*x^2
+1)*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+1/4*b^2*d*arcsin
(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c/(-c^2*x^2+1)^(1/2)+2/3*b*d*x*(a+b*
arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-1/2*b*c*d*
x^2*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-2
/9*b*c^2*d*x^3*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2
+1)^(1/2)+1/6*d*(a+b*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/b/c/(-
c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 455, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {4763, 4847, 4741, 4737, 4723, 327, 222, 4767, 4739, 455, 45}

$$\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = -\frac{bcdx^2\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{2bdx\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} + \frac{d\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} - \frac{d(1-c^2x^2)\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2}{3c} - \frac{2bc^2dx^3\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + \frac{1}{2}dx\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{b^2d\arcsin(cx)\sqrt{cdx+d}\sqrt{e-cex}}{4c\sqrt{1-c^2x^2}} + \frac{2b^2d(1-c^2x^2)\sqrt{cdx+d}\sqrt{e-cex}}{27c} - \frac{1}{4}b^2dx\sqrt{cdx+d}\sqrt{e-cex} + \frac{4b^2d\sqrt{cdx+d}\sqrt{e-cex}}{9c}$$

```
[In] Int[(d + c*d*x)^(3/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (4*b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (b^2*d*x*Sqrt[d + c*d*x]*
Sqrt[e - c*e*x])/4 + (2*b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)
)/(27*c) + (b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1
- c^2*x^2]) + (2*b*d*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))
/(3*Sqrt[1 - c^2*x^2]) - (b*c*d*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*
ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) - (2*b*c^2*d*x^3*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + (d*x*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 - (d*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) + (d*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
```

```
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int (d+cdx)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} \\
&= \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \left(d\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+cdx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\right)\,dx}{\sqrt{1-c^2x^2}} \\
&= \frac{\left(d\sqrt{d+cdx}\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(cd\sqrt{d+cdx}\sqrt{e-cex}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{1}{2}dx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad - \frac{d\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c} \\
&\quad + \frac{\left(d\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2bd\sqrt{d+cdx}\sqrt{e-cex}\right)\int (1-c^2x^2)\,(a+b\arcsin(cx))\,dx}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bcd\sqrt{d+cdx}\sqrt{e-cex}\right)\int x(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2bdx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcdx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&\quad - \frac{2bc^2dx^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&\quad + \frac{1}{2}dx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad - \frac{d\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c} \\
&\quad + \frac{d\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2b^2cd\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(b^2c^2d\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{1}{4}b^2dx\sqrt{d+cdx}\sqrt{e-cex} + \frac{2bdx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} - \frac{bcdx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{2bc^2dx^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + \frac{1}{2}dx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 - \frac{d\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{3c} + \frac{d\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{\left(b^2d\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(b^2cd\sqrt{d+cdx}\sqrt{e-cex}\right)\mathrm{Subst}\left(\int\frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2dx\sqrt{d+cdx}\sqrt{e-cex} + \frac{b^2d\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} + \frac{2bdx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} - \frac{bcdx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{2bc^2dx^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + \frac{1}{2}dx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 - \frac{d\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{3c} + \frac{d\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} - \frac{\left(b^2cd\sqrt{d+cdx}\sqrt{e-cex}\right)\mathrm{Subst}\left(\int\left(\frac{2}{3\sqrt{1-c^2x}}+\frac{1}{3}\sqrt{1-c^2x}\right)dx,x,x^2\right)}{3\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{4b^2d\sqrt{d+cdx}\sqrt{e-cex}}{9c} - \frac{1}{4}b^2dx\sqrt{d+cdx}\sqrt{e-cex} \\
&+ \frac{2b^2d\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{27c} + \frac{b^2d\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} \\
&+ \frac{2bdx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&- \frac{bcdx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&- \frac{2bc^2dx^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&+ \frac{1}{2}dx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&- \frac{d\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{3c} \\
&+ \frac{d\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 3.09 (sec) , antiderivative size = 437, normalized size of antiderivative = 0.96

$$
\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \frac{36b^2d\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 108a^2d^{3/2}\sqrt{e}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right)
$$

```
[In] Integrate[(d + c*d*x)^(3/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (36*b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108*a^2*d^(3/2)*S
qrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt
[d]*Sqrt[e]*(-1 + c^2*x^2))] - 18*b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSi
n[c*x]^2*(-6*a + 3*b*Sqrt[1 - c^2*x^2] + b*Cos[3*ArcSin[c*x]] - 3*b*Sin[2*A
rcSin[c*x]]) + d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(12*(9*b^2*Sqrt[1 - c^2*x^
2] - 4*a*b*c*x*(-3 + c^2*x^2) + 3*a^2*Sqrt[1 - c^2*x^2]*(-2 + 3*c*x + 2*c^2
*x^2)) + 54*a*b*Cos[2*ArcSin[c*x]] + 4*b^2*Cos[3*ArcSin[c*x]] - 27*b^2*Sin[
2*ArcSin[c*x]]) + 6*b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(9*b*Co
s[2*ArcSin[c*x]] + 2*(9*b*c*x - 12*a*Sqrt[1 - c^2*x^2] + 12*a*c^2*x^2*Sqrt[
1 - c^2*x^2] + 9*a*Sin[2*ArcSin[c*x]] + b*Sin[3*ArcSin[c*x]])))/(216*c*Sqrt
[1 - c^2*x^2])
```

Maple [F]

$$\int (cdx+d)^{\frac{3}{2}} (a+b\arcsin(cx))^2 \sqrt{-cex+e}dx$$

[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x)

[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x)

Fricas [F]

$$\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{3}{2}}\sqrt{-cex+e}(b\arcsin(cx)+a)^2\,dx$$

[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm ="fricas")

[Out] integral((a^2*c*d*x + a^2*d + (b^2*c*d*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*c*d*x + a*b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)

Sympy [F]

$$\int (d+cdx)^{3/2}\sqrt{e-cex}(a + b\arcsin(cx))^2\,dx = \int (d(cx+1))^{\frac{3}{2}}\sqrt{-e(cx-1)}(a+b\operatorname{asin}(cx))^2\,dx$$

[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))**2*(-c*e*x+e)**(1/2),x)

[Out] Integral((d*(c*x + 1))**(3/2)*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2, x)

Maxima [F(-2)]

Exception generated.

$$\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm ="maxima")

[Out] Exception raised: ValueError >> Computation failed since Maxima requested additional constraints; using the 'assume' command before evaluation *may* help (example of legal syntax is 'assume(e>0)', see `assume?` for more details)Is e

Giac [F]

$$\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{3}{2}}\sqrt{-cex+e}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2),x, algorithm
="giac")
[Out] integrate((c*d*x + d)^(3/2)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,\sqrt{e-c\,e\,x}\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(1/2),x)
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(1/2), x)
```

3.542 $\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 222

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = -\frac{1}{4}b^2x\sqrt{d+cdx}\sqrt{e-cex} + \frac{b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} - \frac{bcx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}$$

```
[Out] -1/4*b^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+1/2*x*(c*d*x+d)^(1/2)*(-c*e*x+e
)^(1/2)*(a+b*arcsin(c*x))^2+1/4*b^2*arcsin(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^
(1/2)/c/(-c^2*x^2+1)^(1/2)-1/2*b*c*x^2*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-
c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+1/6*(a+b*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(
-c*e*x+e)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 222, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used

$= \{4763, 4741, 4737, 4723, 327, 222\}$

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \frac{\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} - \frac{bcx^2\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{b^2\arcsin(cx)\sqrt{cdx+d}\sqrt{e-cex}}{4c\sqrt{1-c^2x^2}} - \frac{1}{4}b^2x\sqrt{cdx+d}\sqrt{e-cex}$$

```
[In] Int[Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/4*(b^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1 - c^2*x^2]) - (b*c*x^2*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + (x*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 + (Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(bc\sqrt{d+cdx}\sqrt{e-cex}\right)\int x(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{bcx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{bcx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{\left(b^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2x\sqrt{d+cdx}\sqrt{e-cex} + \frac{b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} - \frac{bcx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 1.83 (sec) , antiderivative size = 288, normalized size of antiderivative = 1.30

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \frac{4b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 12a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right) + 6b\sqrt{d+cdx}\sqrt{e-c}}{}$$

```
[In] Integrate[Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (4*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 12*a^2*Sqrt[d]*Sqrt[
e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*
Sqrt[e]*(-1 + c^2*x^2))] + 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*
(b*Cos[2*ArcSin[c*x]] + 2*a*Sin[2*ArcSin[c*x]]) + 6*b*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*ArcSin[c*x]^2*(2*a + b*Sin[2*ArcSin[c*x]]) + 3*Sqrt[d + c*d*x]*S
qrt[e - c*e*x]*(4*a^2*c*x*Sqrt[1 - c^2*x^2] + 2*a*b*Cos[2*ArcSin[c*x]] - b^
2*Sin[2*ArcSin[c*x]]))/(24*c*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int \sqrt{cdx+d}\,\sqrt{-cex+e}\,(a+b\arcsin(cx))^2\,dx$$

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [F]

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int \sqrt{cdx+d}\sqrt{-cex+e}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e), x)
```

Sympy [F]

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$$
$$= \int \sqrt{d(cx+1)}\sqrt{-e(cx-1)}(a+b\operatorname{asin}(cx))^2\,dx$$

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int \sqrt{cdx+d}\sqrt{-cex+e}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx=\int (a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2),x)
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2), x)
```

3.543 $\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 230

$$\begin{aligned}\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx =& -\frac{2abex\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2b^2e(1-c^2x^2)}{c\sqrt{d+cdx}\sqrt{e-cex}}\\&-\frac{2b^2ex\sqrt{1-c^2x^2}\arcsin(cx)}{\sqrt{d+cdx}\sqrt{e-cex}}\\&+\frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}}\\&+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}\end{aligned}$$

```
[Out] -2*b^2*e*(-c^2*x^2+1)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+e*(-c^2*x^2+1)*(a+
b*arcsin(c*x))^2/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*a*b*e*x*(-c^2*x^2+1)^
(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*b^2*e*x*arcsin(c*x)*(-c^2*x^2+1)^(
1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/3*e*(a+b*arcsin(c*x))^3*(-c^2*x^2+1
)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 230, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used

$= \{4763, 4847, 4737, 4767, 4715, 267\}$

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{cdx+d}\sqrt{e-cex}} + \frac{e(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c\sqrt{cdx+d}\sqrt{e-cex}} - \frac{2abex\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\sqrt{e-cex}} - \frac{2b^2ex\sqrt{1-c^2x^2}\arcsin(cx)}{\sqrt{cdx+d}\sqrt{e-cex}} - \frac{2b^2e(1-c^2x^2)}{c\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[In] Int[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (-2*a*b*e*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*e
*(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*e*x*Sqrt[1 - c
^2*x^2]*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (e*(1 - c^2*x^2)*(
a + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (e*Sqrt[1 - c^2
*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(e-cex)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= \frac{\sqrt{1-c^2x^2}\int \left(\frac{e(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{cex(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= \frac{\left(e\sqrt{1-c^2x^2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{\left(ce\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= \frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}\\
&\quad-\frac{\left(2be\sqrt{1-c^2x^2}\right)\int (a+b\arcsin(cx))\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= -\frac{2abex\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}}\\
&\quad+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}-\frac{\left(2b^2e\sqrt{1-c^2x^2}\right)\int \arcsin(cx)\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= -\frac{2abex\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2b^2ex\sqrt{1-c^2x^2}\arcsin(cx)}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}}\\
&\quad+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}+\frac{\left(2b^2ce\sqrt{1-c^2x^2}\right)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= -\frac{2abex\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2b^2e(1-c^2x^2)}{c\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2b^2ex\sqrt{1-c^2x^2}\arcsin(cx)}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&\quad+\frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 2.97 (sec) , antiderivative size = 296, normalized size of antiderivative = 1.29

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx$$
$$= \frac{3\sqrt{d+cdx}\sqrt{e-cex}\left(-2abcx+a^2\sqrt{1-c^2x^2}-2b^2\sqrt{1-c^2x^2}\right)-6b\sqrt{d+cdx}\sqrt{e-cex}\left(bcx-a\sqrt{1-c^2x^2}\right.}{}$$

```
[In] Integrate[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-2*a*b*c*x + a^2*Sqrt[1 - c^2*x^2] - 2*
b^2*Sqrt[1 - c^2*x^2]) - 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(b*c*x - a*Sqr
t[1 - c^2*x^2])*ArcSin[c*x] + 3*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*Sq
rt[1 - c^2*x^2])*ArcSin[c*x]^2 + b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin
[c*x]^3 - 3*a^2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))])/(3*c*d*Sqrt[1 - c^2*
x^2])
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2\sqrt{-cex+e}}{\sqrt{cdx+d}}dx$$

```
[In] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x)
```

Fricas [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{\sqrt{-cex+e}(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(-c*e*x + e)/sqr
t(c*d*x + d), x)
```

Sympy [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{\sqrt{-e\,(cx-1)}(a+b\,\mathrm{asin}\,(cx))^2}{\sqrt{d\,(cx+1)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2*(-c*e*x+e)**(1/2)/(c*d*x+d)**(1/2),x)
[Out] Integral(sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2/sqrt(d*(c*x + 1)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x, algorithm
="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{\sqrt{-cex+e}(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2),x, algorithm
="giac")
[Out] integrate(sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/sqrt(c*d*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{e-c\,e\,x}}{\sqrt{d+c\,d\,x}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(1/2),x)
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(1/2), x)
```

3.544 $\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 530

$$\begin{aligned}\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = & -\frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{2e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\ & -\frac{2ie^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{e^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\ & -\frac{8ibe^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ & +\frac{4be^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ & +\frac{4ib^2e^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ & -\frac{4ib^2e^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ & -\frac{2ib^2e^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}\end{aligned}$$

```
[Out] -2*e^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+
2*e^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-2
*I*e^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^
(3/2)-1/3*e^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(3/2)/(-
c*e*x+e)^(3/2)-8*I*b*e^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+
(-c^2*x^2+1)^(1/2))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*b*e^2*(-c^2*x^2+1)
^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/
```

```
2)/(-c*e*x+e)^(3/2)+4*I*b^2*e^2*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c^
2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*I*b^2*e^2*(-c^2*x^2+1
)^(3/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e
)^(3/2)-2*I*b^2*e^2*(-c^2*x^2+1)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2)
)^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)
```

Rubi [A] (verified)

Time = 0.65 (sec) , antiderivative size = 530, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {4763, 4859, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266, 4737}

$$\begin{aligned}
\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = & -\frac{8ibe^2(1-c^2x^2)^{3/2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
& -\frac{e^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{3bc(cdx+d)^{3/2}(e-cex)^{3/2}}-\frac{2ie^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
& -\frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{2e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}} \\
& +\frac{4be^2(1-c^2x^2)^{3/2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
& +\frac{4ib^2e^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
& -\frac{4ib^2e^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
& -\frac{2ib^2e^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}
\end{aligned}$$

```
[In] Int[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

```
[Out] (-2*e^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*
x)^(3/2)) + (2*e^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)) - ((2*I)*e^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2
)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (e^2*(1 - c^2*x^2)^(3/2)*(a + b
*ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*b*e^2
*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d +
 c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (4*b*e^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcS
in[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(
3/2)) + ((4*I)*b^2*e^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*b^2*e^2*(1 - c^2*x^2)^
(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/
```

```
2)) - ((2*I)*b^2*e^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])]
)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
```

```
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
```

```
0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(e-cex)^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{2(e^2-ce^2x)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}-\frac{e^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{(e^2-ce^2x)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(e^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{e^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2\left(1-c^2x^2\right)^{3/2}\right)\int \left(\frac{e^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}-\frac{ce^2x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{e^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2e^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2ce^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(4be^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(4bce^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(4be^2\left(1-c^2x^2\right)^{3/2}\right)\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(4be^2\left(1-c^2x^2\right)^{3/2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{2ie^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{8ibe^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+ \frac{\left(8ibe^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{\left(4b^2e^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+ \frac{\left(4b^2e^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{2ie^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{8ibe^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+ \frac{4be^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+ \frac{\left(4ib^2e^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{\left(4ib^2e^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{\left(4b^2e^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2ie^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8ibe^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4be^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4ib^2e^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4ib^2e^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2ib^2e^2(1-c^2x^2)^{3/2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2ie^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8ibe^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4be^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4ib^2e^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4ib^2e^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2ib^2e^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

Mathematica [A] (verified)

Time = 5.33 (sec) , antiderivative size = 547, normalized size of antiderivative = 1.03

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \frac{-\frac{6a^2\sqrt{d+cdx}\sqrt{e-cex}}{1+cx}+3a^2\sqrt{d}\sqrt{e}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right)-\frac{3ab\sqrt{d+cdx}\sqrt{e-ce}}{}}{}$$

[In] Integrate[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]

[Out] ((-6*a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(1 + c*x) + 3*a^2*Sqrt[d]*Sqrt[e] *ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - (3*a*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + ((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) + (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((-6 - 6*I)*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + I*Sin[ArcSin[c*x]/2]) - ArcSin[c*x]^3*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 6*ArcSin[c*x]*(I*Pi + 4*Log[1 - I*E^(I*ArcSin[c*x])])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 12*Pi*(2*Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 - I*E^(I*ArcSin[c*x])] - 2*Log[Cos[ArcSin[c*x]/2]] - Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (24*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(3*c*d^2)

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2\sqrt{-cex+e}}{(cdx+d)^{\frac{3}{2}}}dx$$

[In] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x)

[Out] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x)

Fricas [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \int \frac{\sqrt{-cex+e}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x, algorithm="fricas")

[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^2*d^2*x^2 + 2*c*d^2*x + d^2), x)

Sympy [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \int \frac{\sqrt{-e\,(cx-1)}\,(a+b\,\mathrm{asin}\,(cx))^2}{(d\,(cx+1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2*(-c*e*x+e)**(1/2)/(c*d*x+d)**(3/2),x)
[Out] Integral(sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2/(d*(c*x + 1))**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x, algorithm
="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \int \frac{\sqrt{-cex+e}(b\arcsin\,(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2),x, algorithm
="giac")
[Out] integrate(sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{e-c\,e\,x}}{(d+c\,d\,x)^{3/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(3/2),x)
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(3/2), x)
```

3.545 $\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 486

$$\begin{aligned}\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx &= \frac{ie^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\ &- \frac{4b^2e^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\ &+ \frac{e^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\ &- \frac{2be^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\ &- \frac{e^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\ &- \frac{4be^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\ &+ \frac{4ib^2e^3(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}\end{aligned}$$

```
[Out] 1/3*I*e^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+
e)^(5/2)-4/3*b^2*e^3*(-c^2*x^2+1)^(5/2)*cot(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*
x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*e^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*
cot(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*b*e^3*(-
c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c/(c*d*x+d
)^(5/2)/(-c*e*x+e)^(5/2)-1/3*e^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*cot
(1/4*Pi+1/2*arcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-
c*e*x+e)^(5/2)-4/3*b*e^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x
+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+4/3*I*b^2*e^3*(-c^
```

```
2*x^2+1)^(5/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-
c*e*x+e)^(5/2)
```

Rubi [A] (verified)

Time = 0.74 (sec) , antiderivative size = 486, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$, Rules used = {4763, 4859, 4857, 3399, 4271, 3852, 8, 4269, 3798, 2221, 2317, 2438}

$$\begin{aligned}\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = & \frac{ie^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\ & -\frac{4be^3(1-c^2x^2)^{5/2}\log\left(1-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\ & +\frac{e^3(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\ & -\frac{2be^3(1-c^2x^2)^{5/2}\csc^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\ & -\frac{e^3(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\csc^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\ & +\frac{4ib^2e^3(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\ & -\frac{4b^2e^3(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}\end{aligned}$$

```
[In] Int[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

```
[Out] ((I/3)*e^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*
(e - c*e*x)^(5/2)) - (4*b^2*e^3*(1 - c^2*x^2)^(5/2)*Cot[Pi/4 + ArcSin[c*x]/
2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (e^3*(1 - c^2*x^2)^(5/2)*(a
 + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e -
c*e*x)^(5/2)) - (2*b*e^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Csc[Pi/4 +
 ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (e^3*(1 - c^
2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[Pi/4 + Arc
Sin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*b*e^3*(1 - c^
2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/(3*c*(d + c*
d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((4*I)/3)*b^2*e^3*(1 - c^2*x^2)^(5/2)*Poly
Log[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4271

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> Simp[(-b^2)*(c + d*x)^m*Cot[e + f*x]*((b*Csc[e + f*x])^(n - 2)/(f*(n
```

```
- 1))), x] + (Dist[b^2*d^2*m*((m - 1)/(f^2*(n - 1)*(n - 2))), Int[(c + d*x)
^(m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[b^2*((n - 2)/(n - 1)), Int
[(c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[b^2*d*m*(c + d*x)^(m -
 1)*((b*Csc[e + f*x])^(n - 2)/(f^2*(n - 1)*(n - 2))), x]) /; FreeQ[{b, c, d
, e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\left(1-c^2x^2\right)^{5/2}\int\frac{(e-cex)^3(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&= \frac{\left(1-c^2x^2\right)^{5/2}\int\left(\frac{2e^3(a+b\arcsin(cx))^2}{(1+cx)^2\sqrt{1-c^2x^2}}-\frac{e^3(a+b\arcsin(cx))^2}{(1+cx)\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&= -\frac{\left(e^3\left(1-c^2x^2\right)^{5/2}\right)\int\frac{(a+b\arcsin(cx))^2}{(1+cx)\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(2e^3\left(1-c^2x^2\right)^{5/2}\right)\int\frac{(a+b\arcsin(cx))^2}{(1+cx)^2\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&= -\frac{\left(e^3\left(1-c^2x^2\right)^{5/2}\right)\mathrm{Subst}\left(\int\frac{(a+bx)^2}{c+c\sin(x)}\,dx,x,\arcsin(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad+\frac{\left(2ce^3\left(1-c^2x^2\right)^{5/2}\right)\mathrm{Subst}\left(\int\frac{(a+bx)^2}{(c+c\sin(x))^2}\,dx,x,\arcsin(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

$$=-\frac{\left(e^3(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int(a+bx)^2\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{2c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{\left(e^3(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int(a+bx)^2\csc^4\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{2c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{e^3(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{2be^3(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{e^3(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{\left(e^3(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int(a+bx)^2\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{\left(2be^3(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int(a+bx)\cot\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{\left(2b^2e^3(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{ie^3(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{e^3(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{2be^3(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{e^3(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{\left(4be^3(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int(a+bx)\cot\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{\left(4be^3(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{e^{ix}(a+bx)}{1-ie^{ix}}\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{\left(4b^2e^3(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int 1\,dx,x,\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{ie^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4b^2e^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2be^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{e^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4be^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(8be^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{1-ie^{ix}}\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(4b^2e^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{ie^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4b^2e^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2be^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{e^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4be^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(4ib^2e^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(8b^2e^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$
\begin{aligned}
&= \frac{ie^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4b^2e^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{e^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{2be^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{e^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{4be^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{4ib^2e^3(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{\left(8ib^2e^3(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{ie^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4b^2e^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{e^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{2be^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{e^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{4be^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{4ib^2e^3(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

Mathematica [A] (warning: unable to verify)

Time = 9.32 (sec) , antiderivative size = 527, normalized size of antiderivative = 1.08

$$
\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \frac{\sqrt{d+cdx}\sqrt{e-cex}\left(\frac{a^2(-1+cx)^2}{(1+cx)^2} - \frac{ab\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)-\sin\left(\frac{1}{2}\arcsin(cx)\right)\right)\left(\cos\left(\frac{3}{2}a\right.\right.}{}\right.}{}
$$

```
[In] Integrate[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

[Out] (Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((a^2*(-1 + c*x)^2)/(1 + c*x)^2 - (a*b*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Cos[ArcSin[c*x]/2]*(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 2*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4 - (b^2*(-1 + c*x)^2*((-I)*Pi*ArcSin[c*x] + (1 + I)*ArcSin[c*x]^2 - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 - (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (2*(-4 + ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2)))/(3*c*d^3*(-1 + c*x))

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2\sqrt{-cex+e}}{(cdx+d)^{\frac{5}{2}}}dx$$

[In] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x)

[Out] int((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x)

Fricas [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{\sqrt{-cex+e}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x, algorithm="fricas")

[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^3*d^3*x^3 + 3*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)

Sympy [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{\sqrt{-e\,(cx-1)}(a+b\,\mathrm{asin}\,(cx))^2}{(d\,(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2*(-c*e*x+e)**(1/2)/(c*d*x+d)**(5/2),x)
[Out] Integral(sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2/(d*(c*x + 1))**(5/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x, algorithm
="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{\sqrt{-cex+e}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2*(-c*e*x+e)^(1/2)/(c*d*x+d)^(5/2),x, algorithm
="giac")
[Out] integrate(sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(c\,x))^2\,\sqrt{e-c\,e\,x}}{(d+c\,d\,x)^{5/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(5/2),x)
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(5/2), x)
```

3.546 $\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 697

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{8b^2d(d+cdx)^{3/2}(e-cex)^{3/2}}{225c}$$

$$-\frac{1}{32}b^2dx(d+cdx)^{3/2}(e-cex)^{3/2}+\frac{16b^2d(d+cdx)^{3/2}(e-cex)^{3/2}}{75c\,(1-c^2x^2)}-\frac{15b^2dx(d+cdx)^{3/2}(e-cex)^{3/2}}{64\,(1-c^2x^2)}+\frac{2b^2d(d$$

```
[Out] 8/225*b^2*d*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)/c-1/32*b^2*d*x*(c*d*x+d)^(3/2)
*(-c*e*x+e)^(3/2)+16/75*b^2*d*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)/c/(-c^2*x^2+
1)-15/64*b^2*d*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)/(-c^2*x^2+1)+2/125*b^2*d*
(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(-c^2*x^2+1)/c+9/64*b^2*d*(c*d*x+d)^(3/2)*
(-c*e*x+e)^(3/2)*arcsin(c*x)/c/(-c^2*x^2+1)^(3/2)+2/5*b*d*x*(c*d*x+d)^(3/2)
*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2)-3/8*b*c*d*x^2*(c*d*x
+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2)-4/15*b*c^2*
d*x^3*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2)
+2/25*b*c^4*d*x^5*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2*
x^2+1)^(3/2)+1/4*d*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2+3
/8*d*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(-c^2*x^2+1)-1/
5*d*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c+1/8
*d*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^3/b/c/(-c^2*x^2+1)^(3
/2)+1/8*b*d*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))*(-c^2*x^2+1)
^(1/2)/c
```

Rubi [A] (verified)

Time = 0.57 (sec) , antiderivative size = 697, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.469, Rules used = {4763, 4847, 4743, 4741, 4737, 4723, 327, 222, 4767, 201, 200, 4739, 12, 1261, 712}

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx =$$
$$-\frac{3bcdx^2(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8(1-c^2x^2)^{3/2}}$$
$$+\frac{3dx(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8(1-c^2x^2)}$$
$$+\frac{2bdx(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{5(1-c^2x^2)^{3/2}}$$
$$+\frac{d(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^3}{8bc(1-c^2x^2)^{3/2}}$$
$$-\frac{d(1-c^2x^2)(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{5c}$$
$$+\frac{bd\sqrt{1-c^2x^2}(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8c}$$
$$-\frac{4bc^2dx^3(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{15(1-c^2x^2)^{3/2}}$$
$$+\frac{2bc^4dx^5(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{25(1-c^2x^2)^{3/2}}$$
$$+\frac{1}{4}dx(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2+\frac{9b^2d\arcsin(cx)(cdx+d)^{3/2}(e-cex)^{3/2}}{64c(1-c^2x^2)^{3/2}}-\frac{15b^2dx(cdx+d)^{3/2}}{64(1-c^2}$$

```
[In] Int[(d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (8*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/(225*c) - (b^2*d*x*(d + c*d*x
)^(3/2)*(e - c*e*x)^(3/2))/32 + (16*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/
2))/(75*c*(1 - c^2*x^2)) - (15*b^2*d*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
/(64*(1 - c^2*x^2)) + (2*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(1 - c^2
*x^2))/(125*c) + (9*b^2*d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*ArcSin[c*x])/
(64*c*(1 - c^2*x^2)^(3/2)) + (2*b*d*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(
a + b*ArcSin[c*x]))/(5*(1 - c^2*x^2)^(3/2)) - (3*b*c*d*x^2*(d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) - (4*b*c^2
*d*x^3*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(15*(1 - c^
2*x^2)^(3/2)) + (2*b*c^4*d*x^5*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*A
rcSin[c*x]))/(25*(1 - c^2*x^2)^(3/2)) + (b*d*(d + c*d*x)^(3/2)*(e - c*e*x)^
(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c) + (d*x*(d + c*d*x)^(3/2)
*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (3*d*x*(d + c*d*x)^(3/2)*(e -
```

c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^2*x^2)) - (d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(5*c) + (d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*c*(1 - c^2*x^2)^(3/2))

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
```

```
x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
```

```
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\text{integral} = \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int (d+cdx)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(d(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2+cdx(1-c^2x^2)^{3/2}(a+b\arcsin(c\right.}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left(d(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\left(1-c^2x^2\right)^{3/2}} + \frac{\left(cd(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2\,dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}dx(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 - \frac{d(d+cdx)^{3/2}(e-cex)^{3/2}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2}{5c} + \frac{\left(3d(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{4\left(1-c^2x^2\right)^{3/2}} + \frac{\left(2bd(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(1-c^2x^2\right)^2(a+b\arcsin(cx))\,dx}{5\left(1-c^2x^2\right)^{3/2}} - \frac{\left(bcd(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int x(1-c^2x^2)(a+b\arcsin(cx))\,dx}{2\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{2bdx(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{5\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^2dx^3(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{15\left(1-c^2x^2\right)^{3/2}} + \frac{2bc^4dx^5(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{25\left(1-c^2x^2\right)^{3/2}} + \frac{bd(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{1}{4}dx(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{3dx(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8\left(1-c^2x^2\right)} - $$

$$= -\frac{1}{32}b^2dx(d+cdx)^{3/2}(e-cex)^{3/2} + \frac{2bdx(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{5\left(1-c^2x^2\right)^{3/2}} - \frac{3bcdx^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^2dx^3(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{15\left(1-c^2x^2\right)^{3/2}} + \frac{2bc^4dx^5(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{25\left(1-c^2x^2\right)^{3/2}} + \frac{bd(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{1}{4}dx(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{3dx(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8\left(1-c^2x^2\right)} - $$

$$= -\frac{1}{32}b^2dx(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2dx(d+cdx)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)} + \frac{2bdx(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{5\left(1-c^2x^2\right)^{3/2}} - \frac{3bcdx^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8\left(1-c^2x^2\right)^{3/2}} - \frac{4bc^2dx^3(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{15\left(1-c^2x^2\right)^{3/2}} + \frac{2bc^4dx^5(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{25\left(1-c^2x^2\right)^{3/2}} + \frac{bd(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{1}{4}dx(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{3dx(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8\left(1-c^2x^2\right)} - $$

$$= -\frac{1}{32}b^2dx(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2dx(d+cdx)^{3/2}(e-cex)^{3/2}}{64(1-c^2x^2)} + \frac{9b^2d(d+cdx)^{3/2}(e-cex)^{3/2}\arcsin(cx)}{64c(1-c^2x^2)^{3/2}} + \frac{2bdx(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{5(1-c^2x^2)^{3/2}} - \frac{3bcdx^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8(1-c^2x^2)^{3/2}} - \frac{4bc^2dx^3(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{15(1-c^2x^2)^{3/2}} + \frac{2bc^4dx^5(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{25(1-c^2x^2)^{3/2}} + \frac{bd(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{1}{4}dx(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{3dx(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8(1-c^2x^2)}$$

$$= \frac{8b^2d(d+cdx)^{3/2}(e-cex)^{3/2}}{225c} - \frac{1}{32}b^2dx(d+cdx)^{3/2}(e-cex)^{3/2} + \frac{16b^2d(d+cdx)^{3/2}(e-cex)^{3/2}}{75c(1-c^2x^2)} - \frac{15b^2dx(d+cdx)^{3/2}(e-cex)^{3/2}}{64(1-c^2x^2)}$$

Mathematica [A] (verified)

Time = 4.38 (sec) , antiderivative size = 574, normalized size of antiderivative = 0.82

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{d^2e\Big(36000b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 108000a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\,\mathrm{ar}$$

```
[In] Integrate[(d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (d^2*e*(36000*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108000*a^
2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 1800*b*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*ArcSin[c*x]^2*(-10*b*Cos[3*ArcSin[c*x]] - 2*b*Cos[5*ArcSin[c*x]] + 5*
(12*a - 4*b*Sqrt[1 - c^2*x^2] + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSin[c*x
]])) + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(72000*a*b*Cos[2*ArcSin[c*x]] + 4000
*b^2*Cos[3*ArcSin[c*x]] + 4500*a*b*Cos[4*ArcSin[c*x]] + 288*b^2*Cos[5*ArcSi
n[c*x]] - 15*(-4800*b^2*Sqrt[1 - c^2*x^2] - 512*a*b*c*x*(15 - 10*c^2*x^2 +
```

```
3*c^4*x^4) + 480*a^2*Sqrt[1 - c^2*x^2]*(8 - 25*c*x - 16*c^2*x^2 + 10*c^3*x^
3 + 8*c^4*x^4) + 2400*b^2*Sin[2*ArcSin[c*x]] + 75*b^2*Sin[4*ArcSin[c*x]]))
- 60*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(-1200*b*Cos[2*ArcSin[c*
x]] - 75*b*Cos[4*ArcSin[c*x]] - 4*(300*b*c*x - 480*a*Sqrt[1 - c^2*x^2] + 96
0*a*c^2*x^2*Sqrt[1 - c^2*x^2] - 480*a*c^4*x^4*Sqrt[1 - c^2*x^2] + 600*a*Sin
[2*ArcSin[c*x]] + 50*b*Sin[3*ArcSin[c*x]] + 75*a*Sin[4*ArcSin[c*x]] + 6*b*S
in[5*ArcSin[c*x]]))))/(288000*c*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int (cdx+d)^{\frac{5}{2}} (-cex+e)^{\frac{3}{2}} (a+b\arcsin (cx))^2 \, dx$$

```
[In] int((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [F]

$$\int (d+cdx)^{5/2}(e - cex)^{3/2}(a+b\arcsin(cx))^2 \, dx = \int (cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin (cx)+a)^2 \, dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c^3*d^2*e*x^3 + a^2*c^2*d^2*e*x^2 - a^2*c*d^2*e*x - a^2*d^2*
e + (b^2*c^3*d^2*e*x^3 + b^2*c^2*d^2*e*x^2 - b^2*c*d^2*e*x - b^2*d^2*e)*arc
sin(c*x)^2 + 2*(a*b*c^3*d^2*e*x^3 + a*b*c^2*d^2*e*x^2 - a*b*c*d^2*e*x - a*b
*d^2*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 \, dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(5/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{5/2}\,(e-c\,e\,x)^{3/2}\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(3/2), x)
```

3.547 $\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 362

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx =$$
$$-\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2}-\frac{15b^2x(d+cdx)^{3/2}(e-cex)^{3/2}}{64\,(1-c^2x^2)}+\frac{9b^2(d+cdx)^{3/2}(e-cex)^{3/2}\arcsin(cx)}{64c\,(1-c^2x^2)^{3/2}}-\frac{3bc}{}$$

```
[Out] -1/32*b^2*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)-15/64*b^2*x*(c*d*x+d)^(3/2)*(-
c*e*x+e)^(3/2)/(-c^2*x^2+1)+9/64*b^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*arcsi
n(c*x)/c/(-c^2*x^2+1)^(3/2)-3/8*b*c*x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a
+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2)+1/4*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(
a+b*arcsin(c*x))^2+3/8*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))
^2/(-c^2*x^2+1)+1/8*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^3/b/
c/(-c^2*x^2+1)^(3/2)+1/8*b*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x
))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 362, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.281, Rules used = {4763, 4743, 4741, 4737, 4723, 327, 222, 4767, 201}

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^3}{8bc\,(1-c^2x^2)^{3/2}}$$
$$+\frac{3x(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8\,(1-c^2x^2)}$$
$$+\frac{b\sqrt{1-c^2x^2}(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8c}$$
$$-\frac{3bcx^2(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8\,(1-c^2x^2)^{3/2}}$$
$$+\frac{1}{4}x(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2+\frac{9b^2\arcsin(cx)(cdx+d)^{3/2}(e-cex)^{3/2}}{64c\,(1-c^2x^2)^{3/2}}-\frac{15b^2x(cdx+d)^{3/2}(e}{64\,(1-c^2x}$$

```
[In] Int[(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/32*(b^2*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (15*b^2*x*(d + c*d*x)^(
3/2)*(e - c*e*x)^(3/2))/(64*(1 - c^2*x^2)) + (9*b^2*(d + c*d*x)^(3/2)*(e -
c*e*x)^(3/2)*ArcSin[c*x])/(64*c*(1 - c^2*x^2)^(3/2)) - (3*b*c*x^2*(d + c*d*
x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) + (
b*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/(8*c) + (x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 +
 (3*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^
2*x^2)) + ((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*
c*(1 - c^2*x^2)^(3/2))
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
```

```
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\text{integral} = \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{\left(3(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{4\left(1-c^2x^2\right)^{3/2}} - \frac{\left(bc(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{2\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{b(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{1}{4}x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{3x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8\left(1-c^2x^2\right)} + \frac{(3}{}$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{3bcx^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8\left(1-c^2x^2\right)^{3/2}} + \frac{b(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{1}{4}x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{3x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8\left(1-c^2x^2\right)} + \frac{(}{}$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2x(d+cdx)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)} - \frac{3bcx^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8\left(1-c^2x^2\right)^{3/2}} + \frac{b(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{1}{4}x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{3x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8\left(1-c^2x^2\right)} + \frac{(}{}$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2x(d+cdx)^{3/2}(e-cex)^{3/2}}{64(1-c^2x^2)} + \frac{9b^2(d+cdx)^{3/2}(e-cex)^{3/2}\arcsin(cx)}{64c(1-c^2x^2)^{3/2}} - \frac{3bcx^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8(1-c^2x^2)^{3/2}} + \frac{b(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{1}{4}x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{3x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8(1-c^2x^2)} + \frac{(d$$

Mathematica [A] (verified)

Time = 3.13 (sec) , antiderivative size = 373, normalized size of antiderivative = 1.03

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{32b^2de\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 96a^2d^{3/2}e^{3/2}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d}}{\sqrt{d}\sqrt{}}\right.}{}$$

```
[In] Integrate[(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 96*a^2*d^(3/2)*
e^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqr
t[d]*Sqrt[e]*(-1 + c^2*x^2))] + 8*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Arc
Sin[c*x]^2*(12*a + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSin[c*x]]) + d*e*Sqr
t[d + c*d*x]*Sqrt[e - c*e*x]*(160*a^2*c*x*Sqrt[1 - c^2*x^2] - 64*a^2*c^3*x^
3*Sqrt[1 - c^2*x^2] + 64*a*b*Cos[2*ArcSin[c*x]] + 4*a*b*Cos[4*ArcSin[c*x]]
- 32*b^2*Sin[2*ArcSin[c*x]] - b^2*Sin[4*ArcSin[c*x]]) + 4*b*d*e*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(16*b*Cos[2*ArcSin[c*x]] + b*Cos[4*ArcSin[
c*x]] + 4*a*(8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/(256*c*Sqrt[1 - c
^2*x^2])
```

Maple [F]

$$\int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(a+b\arcsin(cx))^2\,dx$$

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [F]

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2\,dx$$

[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm ="fricas")

[Out] integral(-(a^2*c^2*d*e*x^2 - a^2*d*e + (b^2*c^2*d*e*x^2 - b^2*d*e)*arcsin(c *x)^2 + 2*(a*b*c^2*d*e*x^2 - a*b*d*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c* e*x + e), x)

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\text{Timed out}$$

[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)

[Out] Timed out

Maxima [F(-2)]

Exception generated.

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\text{Exception raised: ValueError}$$

[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm ="maxima")

[Out] Exception raised: ValueError >> Computation failed since Maxima requested a dditional constraints; using the 'assume' command before evaluation *may* h elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai ls)Is e

Giac [F]

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2),x)
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2), x)
```

3.548 $\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 455

$$\begin{aligned}
\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx &= -\frac{4b^2e\sqrt{d+cdx}\sqrt{e-cex}}{9c} \\
&- \frac{1}{4}b^2ex\sqrt{d+cdx}\sqrt{e-cex} - \frac{2b^2e\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{27c} \\
&+ \frac{b^2e\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} - \frac{2bex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&- \frac{bcex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&+ \frac{2bc^2ex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&+ \frac{1}{2}ex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+ \frac{e\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{3c} \\
&+ \frac{e\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] -4/9*b^2*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c-1/4*b^2*e*x*(c*d*x+d)^(1/2)*(
-c*e*x+e)^(1/2)-2/27*b^2*e*(-c^2*x^2+1)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+
1/2*e*x*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+1/3*e*(-c^2*x^
2+1)*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+1/4*b^2*e*arcsi
n(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/3*b*e*x*(a+b
*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-1/2*b*c*e
*x^2*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+
2/9*b*c^2*e*x^3*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^
2+1)^(1/2)+1/6*e*(a+b*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/b/c/(
-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 455, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.344$, Rules used = {4763, 4847, 4741, 4737, 4723, 327, 222, 4767, 4739, 455, 45}

$$\begin{aligned}
&\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx= \\
&-\frac{bcex^2\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&-\frac{2bex\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&+\frac{e\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} \\
&+\frac{e(1-c^2x^2)\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2}{3c} \\
&+\frac{2bc^2ex^3\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&+\frac{1}{2}ex\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+\frac{b^2e\arcsin(cx)\sqrt{cdx+d}\sqrt{e-cex}}{4c\sqrt{1-c^2x^2}}-\frac{2b^2e(1-c^2x^2)\sqrt{cdx+d}\sqrt{e-cex}}{27c} \\
&-\frac{1}{4}b^2ex\sqrt{cdx+d}\sqrt{e-cex}-\frac{4b^2e\sqrt{cdx+d}\sqrt{e-cex}}{9c}
\end{aligned}$$

```
[In] Int[Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-4*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (b^2*e*x*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x])/4 - (2*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2
))/(27*c) + (b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1
 - c^2*x^2]) - (2*b*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])
)/(3*Sqrt[1 - c^2*x^2]) - (b*c*e*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b
*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + (2*b*c^2*e*x^3*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + (e*x*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 + (e*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) + (e*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
```

```
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int (e-cex)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} \\
&= \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \left(e\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-cex\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\right)\,dx}{\sqrt{1-c^2x^2}} \\
&= \frac{\left(e\sqrt{d+cdx}\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(ce\sqrt{d+cdx}\sqrt{e-cex}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{1}{2}ex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad + \frac{e\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c} \\
&\quad + \frac{\left(e\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2be\sqrt{d+cdx}\sqrt{e-cex}\right)\int (1-c^2x^2)\,(a+b\arcsin(cx))\,dx}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(bce\sqrt{d+cdx}\sqrt{e-cex}\right)\int x(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{2bex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&\quad + \frac{2bc^2ex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&\quad + \frac{1}{2}ex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad + \frac{e\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c} \\
&\quad + \frac{e\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2b^2ce\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(b^2c^2e\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{1}{4}b^2ex\sqrt{d+cdx}\sqrt{e-cex} - \frac{2bex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}$$
$$- \frac{bcex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}$$
$$+ \frac{2bc^2ex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}$$
$$+ \frac{1}{2}ex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2$$
$$+ \frac{e\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{3c}$$
$$+ \frac{e\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{\left(b^2e\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(b^2ce\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}\left(\int \frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx, x, x^2\right)}{3\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2ex\sqrt{d+cdx}\sqrt{e-cex} + \frac{b^2e\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}}$$
$$- \frac{2bex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}$$
$$- \frac{bcex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}$$
$$+ \frac{2bc^2ex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}$$
$$+ \frac{1}{2}ex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2$$
$$+ \frac{e\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{3c}$$
$$+ \frac{e\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(b^2ce\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}\left(\int \left(\frac{2}{3\sqrt{1-c^2x}} + \frac{1}{3}\sqrt{1-c^2x}\right)dx, x, x^2\right)}{3\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{4b^2e\sqrt{d+cdx}\sqrt{e-cex}}{9c} - \frac{1}{4}b^2ex\sqrt{d+cdx}\sqrt{e-cex} \\
&\quad - \frac{2b^2e\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{27c} + \frac{b^2e\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} \\
&\quad - \frac{2bex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&\quad + \frac{2bc^2ex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&\quad + \frac{1}{2}ex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad + \frac{e\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{3c} \\
&\quad + \frac{e\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 2.90 (sec) , antiderivative size = 440, normalized size of antiderivative = 0.97

$$
\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{36b^2e\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 108a^2\sqrt{d}e^{3/2}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right)}{}
$$

```
[In] Integrate[Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (36*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108*a^2*Sqrt[d]*e
^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt
[d]*Sqrt[e]*(-1 + c^2*x^2))] + 18*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSi
n[c*x]^2*(6*a + 3*b*Sqrt[1 - c^2*x^2] + b*Cos[3*ArcSin[c*x]] + 3*b*Sin[2*Ar
cSin[c*x]]) + e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(54*a*b*Cos[2*ArcSin[c*x]]
- 4*b^2*Cos[3*ArcSin[c*x]] - 3*(4*(9*b^2*Sqrt[1 - c^2*x^2] - 4*a*b*c*x*(-3
+ c^2*x^2) + 3*a^2*Sqrt[1 - c^2*x^2]*(-2 - 3*c*x + 2*c^2*x^2)) + 9*b^2*Sin[
2*ArcSin[c*x]])) - 6*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(-9*b*
Cos[2*ArcSin[c*x]] + 2*(9*b*c*x - 12*a*Sqrt[1 - c^2*x^2] + 12*a*c^2*x^2*Sqr
t[1 - c^2*x^2] - 9*a*Sin[2*ArcSin[c*x]] + b*Sin[3*ArcSin[c*x]])))/(216*c*Sq
rt[1 - c^2*x^2])
```

Maple [F]

$$\int \sqrt{cdx+d}\,(-cex+e)^{\frac{3}{2}}\,(a+b\arcsin(cx))^2\,dx$$

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [F]

$$\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{cdx+d}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
[Out] integral(-(a^2*c*e*x - a^2*e + (b^2*c*e*x - b^2*e)*arcsin(c*x)^2 + 2*(a*b*c
*e*x - a*b*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F]

$$\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{d(cx+1)}(-e(cx-1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}(cx))^2\,dx$$

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
[Out] Integral(sqrt(d*(c*x + 1))*(-e*(c*x - 1))**(3/2)*(a + b*asin(c*x))**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{cdx+d}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,(e-c\,e\,x)^{3/2}\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(3/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(3/2), x)
```

3.549 $\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 398

$$\begin{aligned}
&\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \\
&-\frac{4b^2e^2(1-c^2x^2)}{c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{b^2e^2x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}} \\
&-\frac{b^2e^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}}-\frac{4be^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{\sqrt{d+cdx}\sqrt{e-cex}} \\
&+\frac{bce^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2e^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}} \\
&-\frac{e^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}}+\frac{e^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}$$

```
[Out] -4*b^2*e^2*(-c^2*x^2+1)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/4*b^2*e^2*x*(-
c^2*x^2+1)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*e^2*(-c^2*x^2+1)*(a+b*arcsin(
c*x))^2/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/2*e^2*x*(-c^2*x^2+1)*(a+b*arcs
in(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/4*b^2*e^2*arcsin(c*x)*(-c^2*x
^2+1)^(1/2)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-4*b*e^2*x*(a+b*arcsin(c*x))*
(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/2*b*c*e^2*x^2*(a+b*ar
csin(c*x))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/2*e^2*(a+b
*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 398, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.281, Rules used = {4763, 4857, 3398, 3377, 2718, 3392, 32, 2715, 8}

$$\begin{aligned}\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx=&\ \frac{e^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc\sqrt{cdx+d}\sqrt{e-cex}}\\&+\frac{2e^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c\sqrt{cdx+d}\sqrt{e-cex}}-\frac{e^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2\sqrt{cdx+d}\sqrt{e-cex}}\\&+\frac{bce^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{cdx+d}\sqrt{e-cex}}-\frac{4be^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{\sqrt{cdx+d}\sqrt{e-cex}}\\&-\frac{b^2e^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{cdx+d}\sqrt{e-cex}}-\frac{4b^2e^2(1-c^2x^2)}{c\sqrt{cdx+d}\sqrt{e-cex}}+\frac{b^2e^2x(1-c^2x^2)}{4\sqrt{cdx+d}\sqrt{e-cex}}\end{aligned}$$

```
[In] Int[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (-4*b^2*e^2*(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*e^2*x
*(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (b^2*e^2*Sqrt[1 - c^2
*x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (4*b*e^2*x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b*c*
e^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]) + (2*e^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]) - (e^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x]) + (e^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(2*b*
c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2718

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3377

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
-(c + d*x)^m)*(Cos[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Co
s[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3392

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[d*m*(c + d*x)^(m - 1)*((b*Sin[e + f*x])^n/(f^2*n^2)), x] + (Dist
[b^2*((n - 1)/n), Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[d
^2*m*((m - 1)/(f^2*n^2)), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[b*(c + d*x)^m*Cos[e + f*x]*((b*Sin[e + f*x])^(n - 1)/(f*n)), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 3398

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{(e-cex)^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int (a+bx)^2(ce-ce\sin(x))^2\,dx,x,\arcsin(cx)\right)}{c^3\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int \left(c^2e^2(a+bx)^2-2c^2e^2(a+bx)^2\sin(x)+c^2e^2(a+bx)^2\sin^2(x)\right)\,dx,x,\arcsin(cx)\right)}{c^3\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{e^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(e^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\sin^2(x)\,dx,x,\arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2e^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\sin(x)\,dx,x,\arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{bce^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2e^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{e^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{e^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(e^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\,dx,x,\arcsin(cx)\right)}{2c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(4be^2\sqrt{1-c^2x^2}\right)\text{Subst}(\int (a+bx)\cos(x)\,dx,x,\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(b^2e^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \sin^2(x)\,dx,x,\arcsin(cx)\right)}{2c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{b^2e^2x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}} - \frac{4be^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{bce^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2e^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{e^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{e^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(b^2e^2\sqrt{1-c^2x^2}\right)\text{Subst}(\int 1\,dx,x,\arcsin(cx))}{4c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(4b^2e^2\sqrt{1-c^2x^2}\right)\text{Subst}(\int \sin(x)\,dx,x,\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{4b^2e^2(1-c^2x^2)}{c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{b^2e^2x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}} - \frac{b^2e^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{4be^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{bce^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{e^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc\sqrt{d+cdx}\sqrt{e-cex}}$$

Mathematica [A] (verified)

Time = 9.07 (sec) , antiderivative size = 358, normalized size of antiderivative = 0.90

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \frac{4b^2e\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 12a^2\sqrt{d}e^{3/2}\sqrt{1-c^2x^2}\arctan\Big(}{}$$

```
[In] Integrate[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (4*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 12*a^2*Sqrt[d]*e^(
3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d
]*Sqrt[e]*(-1 + c^2*x^2))] - 2*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c
*x]*(16*b*c*x + 4*a*(-4 + c*x)*Sqrt[1 - c^2*x^2] + b*Cos[2*ArcSin[c*x]]) +
2*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(6*a + 8*b*Sqrt[1 - c^2
*x^2] - b*Sin[2*ArcSin[c*x]]) + e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-4*(8*a*
b*c*x + 8*b^2*Sqrt[1 - c^2*x^2] + a^2*(-4 + c*x)*Sqrt[1 - c^2*x^2]) - 2*a*b
*Cos[2*ArcSin[c*x]] + b^2*Sin[2*ArcSin[c*x]]))/(8*c*d*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int \frac{(-cex+e)^{\frac{3}{2}}(a+b\arcsin(cx))^2}{\sqrt{cdx+d}}\,dx$$

```
[In] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x)
```

```
[Out] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x)
```

Fricas [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx=\int \frac{(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}}\,dx$$

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c*e*x - a^2*e + (b^2*c*e*x - b^2*e)*arcsin(c*x)^2 + 2*(a*b*c
*e*x - a*b*e)*arcsin(c*x))*sqrt(-c*e*x + e)/sqrt(c*d*x + d), x)
```

Sympy [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx=\int \frac{(-e(cx-1))^{\frac{3}{2}}\,(a+b\operatorname{asin}(cx))^2}{\sqrt{d\,(cx+1)}}\,dx$$

```
[In] integrate((-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2),x)
```

```
[Out] Integral((-e*(c*x - 1))**(3/2)*(a + b*asin(c*x))**2/sqrt(d*(c*x + 1)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}}\,dx$$

[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm ="giac")

[Out] integrate((-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/sqrt(c*d*x + d), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{3/2}}{\sqrt{d+c\,d\,x}}\,dx$$

[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(1/2),x)

[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(1/2), x)

3.550 $\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 714

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \frac{2abe^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4e^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4ie^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{16ibe^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8be^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8ib^2e^3(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8ib^2e^3(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4ib^2e^3(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

```
[Out] 2*a*b*e^3*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*b^2*e^3*(
-c^2*x^2+1)^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*b^2*e^3*x*(-c^2*x^2+1)^(
```

```
3/2)*arcsin(c*x)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*e^3*(-c^2*x^2+1)*(a+b*a
rcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*e^3*x*(-c^2*x^2+1)*(a+b*
arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*I*e^3*(-c^2*x^2+1)^(3/2)*
(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-e^3*(-c^2*x^2+1)^2*(
a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-e^3*(-c^2*x^2+1)^(3/2
)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-16*I*b*e^3*(-c^2
*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+d
)^(3/2)/(-c*e*x+e)^(3/2)+8*b*e^3*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+8*I*b^2*e^
3*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(
3/2)/(-c*e*x+e)^(3/2)-8*I*b^2*e^3*(-c^2*x^2+1)^(3/2)*polylog(2,I*(I*c*x+(-c
^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*I*b^2*e^3*(-c^2*x^2+
1)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x
+e)^(3/2)
```

Rubi [A] (verified)

Time = 0.72 (sec) , antiderivative size = 714, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.469$, Rules used = {4763, 4859, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266, 4737, 4715,

267}

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = -\frac{16ibe^3(1-c^2x^2)^{3/2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{4ie^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{4e^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{4e^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{8be^3(1-c^2x^2)^{3/2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{2abe^3x(1-c^2x^2)^{3/2}}{(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{8ib^2e^3(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{8ib^2e^3(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{4ib^2e^3(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3(1-c^2x^2)^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}$$

```
[In] Int[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

```
[Out] (2*a*b*e^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (
2*b^2*e^3*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (2*b^2
*e^3*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - (4*e^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e -
c*e*x)^(3/2)) + (4*e^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^
(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*e^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x
])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (e^3*(1 - c^2*x^2)^2*(a + b
*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (e^3*(1 - c^2*x^
2)^(3/2)*(a + b*ArcSin[c*x])^3)/(b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
 ((16*I)*b*e^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c
*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*b*e^3*(1 - c^2*x^2)^(3/
2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)
*(e - c*e*x)^(3/2)) + ((8*I)*b^2*e^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^
(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*b^2*e^3*
(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(
e - c*e*x)^(3/2)) - ((4*I)*b^2*e^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)
*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
```

```
b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(1-c^2x^2)^{3/2}\int \frac{(e-cex)^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{(1-c^2x^2)^{3/2}\int \left(\frac{4(e^3-ce^3x)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}-\frac{3e^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{ce^3x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{\left(4(1-c^2x^2)^{3/2}\right)\int \frac{(e^3-ce^3x)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad-\frac{\left(3e^3(1-c^2x^2)^{3/2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{\left(ce^3(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= -\frac{e^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{e^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad+\frac{\left(4(1-c^2x^2)^{3/2}\right)\int \left(\frac{e^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}-\frac{ce^3x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad+\frac{\left(2be^3(1-c^2x^2)^{3/2}\right)\int (a+b\arcsin(cx))\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{2abe^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{e^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad-\frac{e^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{\left(4e^3(1-c^2x^2)^{3/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad+\frac{\left(2b^2e^3(1-c^2x^2)^{3/2}\right)\int \arcsin(cx)\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{\left(4ce^3(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}$$

$$= \frac{2abe^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4e^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(8be^3(1-c^2x^2)^{3/2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(8bce^3(1-c^2x^2)^{3/2}\right)\int\frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2b^2ce^3(1-c^2x^2)^{3/2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{2abe^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4e^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(8be^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(8be^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{2abe^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4e^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4ie^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{16ibe^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(16ibe^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(8b^2e^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(8b^2e^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{2abe^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4e^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4ie^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{16ibe^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8be^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(8ib^2e^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(8ib^2e^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(8b^2e^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$
\begin{aligned}
&= \frac{2abe^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{2b^2e^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^3(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{4e^3x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4ie^3(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{e^3(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{16ibe^3(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{8be^3(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{8ib^2e^3(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{8ib^2e^3(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{\left(4ib^2e^3(1-c^2x^2)^{3/2}\right)\mathrm{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2abe^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b^2e^3(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{2b^2e^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^3(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{4e^3x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4ie^3(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{e^3(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{e^3(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{16ibe^3(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{8be^3(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{8ib^2e^3(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{8ib^2e^3(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{4ib^2e^3(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 12.92 (sec) , antiderivative size = 1086, normalized size of antiderivative = 1.52

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \frac{-3a^2e(5+cx)\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)+\sin\right.}{}$$

```
[In] Integrate[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

```
[Out] (-3*a^2*e*(5 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(Cos[
ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 9*a^2*Sqrt[d]*e^(3/2)*(1 + c*x)*Sqrt
[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]
*(-1 + c^2*x^2))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 3*a*b*e*(1 +
c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[c*x]*(4 +
ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + ((-4 + Arc
Sin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin
[ArcSin[c*x]/2]) - b^2*e*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((6 + 6*
I)*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + I*Sin[ArcSin[c*x]/2]) + ArcSin[c*x]^
3*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (6*I)*ArcSin[c*x]*(Pi - (4*I)
*Log[1 - I*E^(I*ArcSin[c*x])])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) -
12*Pi*(2*Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 - I*E^(I*ArcSin[c*x])] - 2*L
og[Cos[ArcSin[c*x]/2]] - Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*(Cos[ArcSin[c*x]
/2] + Sin[ArcSin[c*x]/2]) + (24*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos[Arc
Sin[c*x]/2] + Sin[ArcSin[c*x]/2])) - 6*a*b*e*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]*(ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (c*x
 + 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2]) + ArcSin[c*x]*((2 + Sqrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2]
 + (-2 + Sqrt[1 - c^2*x^2])*Sin[ArcSin[c*x]/2])) - b^2*e*(1 + c*x)*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x]*(2*ArcSin[c*x]^3*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c
*x]/2]) - (6*I)*ArcSin[c*x]*(Pi - I*c*x - (4*I)*Log[1 - I*E^(I*ArcSin[c*x])
])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 6*(Sqrt[1 - c^2*x^2] + 4*Pi*
Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Log[1 - I*E^(I*ArcSin[c*x])] - 4*Pi*Lo
g[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*(Cos[ArcSin[
c*x]/2] + Sin[ArcSin[c*x]/2]) + (24*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos
[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 3*ArcSin[c*x]^2*(((2 + 2*I) + Sqrt[
1 - c^2*x^2])*Cos[ArcSin[c*x]/2] + ((-2 + 2*I) + Sqrt[1 - c^2*x^2])*Sin[Arc
Sin[c*x]/2])))/(3*c*d^2*(1 + c*x)*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + S
in[ArcSin[c*x]/2]))
```

Maple [F]

$$\int \frac{(-cex+e)^{\frac{3}{2}} (a+b \arcsin(cx))^2}{(cdx+d)^{\frac{3}{2}}} dx$$

```
[In] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x)
[Out] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x)
```

Fricas [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}} dx = \int \frac{(-cex+e)^{\frac{3}{2}} (b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}} dx$$

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="fricas")
[Out] integral(-(a^2*c*e*x - a^2*e + (b^2*c*e*x - b^2*e)*arcsin(c*x)^2 + 2*(a*b*c
*e*x - a*b*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^2*d^2*x^2 +
2*c*d^2*x + d^2), x)
```

Sympy [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}} dx = \int \frac{(-e(cx-1))^{\frac{3}{2}} (a+b\operatorname{asin}(cx))^2}{(d(cx+1))^{\frac{3}{2}}} dx$$

```
[In] integrate((-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2),x)
[Out] Integral((-e*(c*x - 1))**(3/2)*(a + b*asin(c*x))**2/(d*(c*x + 1))**(3/2), x
)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}} dx = \text{Exception raised: ValueError}$$

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx=\int \frac{(-cex+e)^{\frac{3}{2}}(b\arcsin{(cx)}+a)^2}{(cdx+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{3/2}}{(d+c\,d\,x)^{3/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(3/2), x)
```

3.551 $\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 544

$$\begin{aligned}
\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx &= \frac{8ie^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{8b^2e^4(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{8e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{4be^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{2e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{32be^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{32ib^2e^4(1-c^2x^2)^{5/2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}$$

```
[Out] 8/3*I*e^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+
e)^(5/2)+1/3*e^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(5/2)
/(-c*e*x+e)^(5/2)-8/3*b^2*e^4*(-c^2*x^2+1)^(5/2)*cot(1/4*Pi+1/2*arcsin(c*x)
)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+8/3*e^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin
(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-4/3
*b*e^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c
/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*e^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*
x))^2*cot(1/4*Pi+1/2*arcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c/(c*d*x+d)
^(5/2)/(-c*e*x+e)^(5/2)-32/3*b*e^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(
```

```
1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+32/3*I*b
^2*e^4*(-c^2*x^2+1)^(5/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+
d)^(5/2)/(-c*e*x+e)^(5/2)
```

Rubi [A] (verified)

Time = 0.79 (sec) , antiderivative size = 544, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {4763, 4859, 4737, 4857, 3399, 4271, 3852, 8, 4269, 3798, 2221, 2317, 2438}

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \frac{e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{8ie^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{32be^4(1-c^2x^2)^{5/2}\log\left(1-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{8e^4(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{4be^4(1-c^2x^2)^{5/2}\csc^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{2e^4(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\csc^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{32ib^2e^4(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{8b^2e^4(1-c^2x^2)^{5/2}\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}$$

```
[In] Int[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

```
[Out] ((((8*I)/3)*e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5
/2)*(e - c*e*x)^(5/2)) + (e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^3)/(3
*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (8*b^2*e^4*(1 - c^2*x^2)^(5/2)*
Cot[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (8*e
^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2])/(3*
c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*b*e^4*(1 - c^2*x^2)^(5/2)*(a +
b*ArcSin[c*x])*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e
*x)^(5/2)) - (2*e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + Ar
cSin[c*x]/2]*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) - (32*b*e^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Log[1 - I*E^(I
*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((32*I)/3)*b^2
*e^4*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5
/2)*(e - c*e*x)^(5/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4271

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> Simp[(-b^2)*(c + d*x)^m*Cot[e + f*x]*((b*Csc[e + f*x])^(n - 2)/(f*(n
- 1))), x] + (Dist[b^2*d^2*m*((m - 1)/(f^2*(n - 1)*(n - 2))), Int[(c + d*x)
^(m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[b^2*((n - 2)/(n - 1)), Int
[(c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[b^2*d*m*(c + d*x)^(m -
 1)*((b*Csc[e + f*x])^(n - 2)/(f^2*(n - 1)*(n - 2))), x]) /; FreeQ[{b, c, d
, e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int \frac{(e-cex)^4(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{(1-c^2x^2)^{5/2}\int\left(\frac{e^4(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{4e^4(a+b\arcsin(cx))^2}{(1+cx)^2\sqrt{1-c^2x^2}}-\frac{4e^4(a+b\arcsin(cx))^2}{(1+cx)\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(e^4(1-c^2x^2)^{5/2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(4e^4(1-c^2x^2)^{5/2}\right)\int\frac{(a+b\arcsin(cx))^2}{(1+cx)^2\sqrt{1-c^2x^2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(4e^4(1-c^2x^2)^{5/2}\right)\int\frac{(a+b\arcsin(cx))^2}{(1+cx)\sqrt{1-c^2x^2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(4e^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{(a+bx)^2}{c+c\sin(x)}dx,x,\arcsin(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(4ce^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{(a+bx)^2}{(c+c\sin(x))^2}dx,x,\arcsin(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(e^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)^2\csc^4\left(\frac{\pi}{4}+\frac{x}{2}\right)dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2e^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)^2\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4be^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2e^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)^2\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(8be^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)\cot\left(\frac{\pi}{4}+\frac{x}{2}\right)dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(4b^2e^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{4ie^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{8e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{4be^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{2e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(8be^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)\cot\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(16be^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{1-ie^{ix}}\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(8b^2e^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int 1\,dx,x,\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{8ie^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{8b^2e^4(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{8e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{4be^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{2e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{16be^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(16be^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{1-ie^{ix}}\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(16b^2e^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{8ie^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{8b^2e^4(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{8e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{4be^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{2e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{32be^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{\left(16ib^2e^4(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{\left(16b^2e^4(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{8ie^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{8b^2e^4(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{8e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{4be^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{2e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{32be^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{16ib^2e^4(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{\left(16ib^2e^4(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{8ie^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{8b^2e^4(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{8e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{4be^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{2e^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{32be^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{32ib^2e^4(1-c^2x^2)^{5/2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1438 vs. $2(544) = 1088$.

Time = 18.46 (sec) , antiderivative size = 1438, normalized size of antiderivative = 2.64

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \frac{\sqrt{-e(-1+cx)}\sqrt{d(1+cx)}\left(-\frac{4a^2e}{3d^3(1+cx)^2}+\frac{8a^2e}{3d^3(1+cx)}\right)}{c}$$
$$- \frac{a^2e^{3/2}\arctan\left(\frac{cx\sqrt{-e(-1+cx)}\sqrt{d(1+cx)}}{\sqrt{d}\sqrt{e}(-1+cx)(1+cx)}\right)}{cd^{5/2}}$$
$$- \frac{abe\sqrt{d+cdx}\sqrt{e-cex}\sqrt{-de(1-c^2x^2)}\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)-\sin\left(\frac{1}{2}\arcsin(cx)\right)\right)\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)(-8+\right.}{}$$
$$- \frac{abe\sqrt{d+cdx}\sqrt{e-cex}\sqrt{-de(1-c^2x^2)}\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)-\sin\left(\frac{1}{2}\arcsin(cx)\right)\right)\left(\cos\left(\frac{3}{2}\arcsin(cx)\right)(\mathrm{arcsin}\right.}{}$$
$$- \frac{b^2e(-1+cx)\sqrt{d+cdx}\sqrt{e-cex}\sqrt{-de(1-c^2x^2)}\left(-i\pi\arcsin(cx)+(1+i)\arcsin(cx)^2-4\pi\log\left(1+e^{-i\,\mathrm{ar}}\right.\right.}{}$$
$$+ \frac{b^2e(-1+cx)\sqrt{d+cdx}\sqrt{e-cex}\sqrt{-de(1-c^2x^2)}\left(7i\pi\arcsin(cx)-(7+7i)\arcsin(cx)^2-\arcsin(cx)^3+28\right.}{}$$

```
[In] Integrate[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((-4*a^2*e)/(3*d^3*(1 + c*x)^2) +
(8*a^2*e)/(3*d^3*(1 + c*x))))/c - (a^2*e^(3/2)*ArcTan[(c*x*Sqrt[-(e*(-1 + c
*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*(1 + c*x))])/(c*d^(5/2
)) - (a*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos
[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2]*(-8 + 6*ArcSin[c*
x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + C
os[(3*ArcSin[c*x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[ArcSin
[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-4 + 4*ArcSin[c*x] + 6*ArcSin[c*x]^2 +
 Sqrt[1 - c^2*x^2]*(ArcSin[c*x]*(14 + 3*ArcSin[c*x]) - 28*Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]]) - 56*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2]])*Sin[ArcSin[c*x]/2]))/(6*c*d^3*(-1 + c*x)*Sqrt[(-d - c*d*x)*(e - c*e*x)
]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - (a*b*e*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2])*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2]]) - Cos[ArcSin[c*x]/2]*(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcS
in[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-2 + 2*ArcSin[c*x] + Sqrt[1 - c^2*x^
2]*ArcSin[c*x] - 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 2*Sqrt[1
- c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]
))/(3*c*d^3*(-1 + c*x)*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] +
 Sin[ArcSin[c*x]/2])^4) - (b^2*e*(-1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]
*Sqrt[-(d*e*(1 - c^2*x^2))]*((-I)*Pi*ArcSin[c*x] + (1 + I)*ArcSin[c*x]^2 -
4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*
ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Log[Sin[(Pi + 2*ArcSin[
c*x])/4]] + (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] + (4*ArcSin[c*x]^2*Sin[Ar
cSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 - (2*ArcSin[c*x]*
(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (2*(-4 + A
rcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])
))/(3*c*d^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2])^2) + (b^2*e*(-1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e -
 c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((7*I)*Pi*ArcSin[c*x] - (7 + 7*I)*ArcSin
[c*x]^2 - ArcSin[c*x]^3 + 28*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 14*(Pi + 2*
ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] - 28*Pi*Log[Cos[ArcSin[c*x]/2]] -
 14*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (28*I)*PolyLog[2, I*E^(I*ArcSin[c
*x])] - (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcS
in[c*x]/2])^3 + (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin
[ArcSin[c*x]/2])^2 + (2*(-4 + 7*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[Arc
Sin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(3*c*d^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]
*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2)
```

Maple [F]

$$\int \frac{(-cex+e)^{\frac{3}{2}} (a+b\arcsin (cx))^2}{(cdx+d)^{\frac{5}{2}}}dx$$

```
[In] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x)
[Out] int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x)
```

Fricas [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{(-cex+e)^{\frac{3}{2}}(b\arcsin (cx)+a)^2}{(cdx+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="fricas")
[Out] integral(-(a^2*c*e*x - a^2*e + (b^2*c*e*x - b^2*e)*arcsin(c*x)^2 + 2*(a*b*c
*e*x - a*b*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^3*d^3*x^3 +
3*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{(-e(cx-1))^{\frac{3}{2}} (a+b\operatorname{asin}(cx))^2}{(d(cx+1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(5/2),x)
[Out] Integral((-e*(c*x - 1))**(3/2)*(a + b*asin(c*x))**2/(d*(c*x + 1))**(5/2), x
)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx=\int \frac{(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="giac")
[Out] integrate((-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{3/2}}{(d+c\,d\,x)^{5/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(5/2),x)
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(5/2), x)
```

3.552 $\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 502

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = -\frac{1}{108}b^2x(d+cdx)^{5/2}(e-cex)^{5/2}-\frac{245b^2x(d+cdx)^{5/2}(e-cex)^{5/2}}{1152\,(1-c^2x^2)^2}-\frac{65b^2x(d+cdx)^{5/2}(e-cex)^{5/2}}{1728\,(1-c^2x^2)}+\frac{115b^2(d+$$

```
[Out] -1/108*b^2*x*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)-245/1152*b^2*x*(c*d*x+d)^(5/2
)*(-c*e*x+e)^(5/2)/(-c^2*x^2+1)^2-65/1728*b^2*x*(c*d*x+d)^(5/2)*(-c*e*x+e)^
(5/2)/(-c^2*x^2+1)+115/1152*b^2*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*arcsin(c*x
)/c/(-c^2*x^2+1)^(5/2)-5/16*b*c*x^2*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*a
rcsin(c*x))/(-c^2*x^2+1)^(5/2)+1/6*x*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*
arcsin(c*x))^2+5/16*x*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/
(-c^2*x^2+1)^2+5/24*x*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/
(-c^2*x^2+1)+5/48*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^3/b/c/
(-c^2*x^2+1)^(5/2)+5/48*b*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x)
)/c/(-c^2*x^2+1)^(1/2)+1/18*b*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(
c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 502, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.281$, Rules used

$= \{4763, 4743, 4741, 4737, 4723, 327, 222, 4767, 201\}$

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{5(cdx+d)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^3}{48bc\left(1-c^2x^2\right)^{5/2}}$$
$$+\frac{5x(cdx+d)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2}{24\left(1-c^2x^2\right)}$$
$$+\frac{5x(cdx+d)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2}{16\left(1-c^2x^2\right)^2}$$
$$+\frac{b\sqrt{1-c^2x^2}(cdx+d)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))}{18c}$$
$$+\frac{5b(cdx+d)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))}{48c\sqrt{1-c^2x^2}}$$
$$-\frac{5bcx^2(cdx+d)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))}{16\left(1-c^2x^2\right)^{5/2}}$$
$$+\frac{1}{6}x(cdx+d)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2+\frac{115b^2\arcsin(cx)(cdx+d)^{5/2}(e-cex)^{5/2}}{1152c\left(1-c^2x^2\right)^{5/2}}-\frac{65b^2x(cdx+d)^{5/2}}{1728\left(1-\right.}$$

```
[In] Int[(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/108*(b^2*x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (245*b^2*x*(d + c*d*x)
^(5/2)*(e - c*e*x)^(5/2))/(1152*(1 - c^2*x^2)^2) - (65*b^2*x*(d + c*d*x)^(5
/2)*(e - c*e*x)^(5/2))/(1728*(1 - c^2*x^2)) + (115*b^2*(d + c*d*x)^(5/2)*(e
 - c*e*x)^(5/2)*ArcSin[c*x])/(1152*c*(1 - c^2*x^2)^(5/2)) - (5*b*c*x^2*(d +
 c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x]))/(16*(1 - c^2*x^2)^(5/2
)) + (5*b*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x]))/(48*c*Sq
rt[1 - c^2*x^2]) + (b*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*Sqrt[1 - c^2*x^2]
*(a + b*ArcSin[c*x]))/(18*c) + (x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a +
b*ArcSin[c*x])^2)/6 + (5*x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSi
n[c*x])^2)/(16*(1 - c^2*x^2)^2) + (5*x*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*
(a + b*ArcSin[c*x])^2)/(24*(1 - c^2*x^2)) + (5*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)*(a + b*ArcSin[c*x])^3)/(48*b*c*(1 - c^2*x^2)^(5/2))
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
```

```
e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\text{integral} = \frac{\left((d+cdx)^{5/2}(e-cex)^{5/2}\right)\int \left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx}{\left(1-c^2x^2\right)^{5/2}}$$

$$= \frac{1}{6}x(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2 + \frac{\left(5(d+cdx)^{5/2}(e-cex)^{5/2}\right)\int \left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{6\left(1-c^2x^2\right)^{5/2}} - \frac{\left(bc(d+cdx)^{5/2}(e-cex)^{5/2}\right)\int x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))\,dx}{3\left(1-c^2x^2\right)^{5/2}}$$

$$= \frac{b(d+cdx)^{5/2}(e-cex)^{5/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} + \frac{1}{6}x(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2 + \frac{5x(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2}{24\left(1-c^2x^2\right)} + \frac{(5}{}$$

$$= -\frac{1}{108}b^2x(d+cdx)^{5/2}(e-cex)^{5/2} + \frac{5b(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))}{48c\sqrt{1-c^2x^2}} + \frac{b(d+cdx)^{5/2}(e-cex)^{5/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} + \frac{1}{6}x(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2 + \frac{5x(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2}{16\left(1-c^2x^2\right)^2} + \frac{5}{}$$

$$= -\frac{1}{108}b^2x(d+cdx)^{5/2}(e-cex)^{5/2} - \frac{65b^2x(d+cdx)^{5/2}(e-cex)^{5/2}}{1728(1-c^2x^2)} - \frac{5bcx^2(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))}{16(1-c^2x^2)^{5/2}} + \frac{5b(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))}{48c\sqrt{1-c^2x^2}} + \frac{b(d+cdx)^{5/2}(e-cex)^{5/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} + \frac{1}{6}x(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2 + \frac{5x(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2}{16(1-c^2x^2)^2} + \frac{5x}{}$$

$$= -\frac{1}{108}b^2x(d+cdx)^{5/2}(e-cex)^{5/2} - \frac{245b^2x(d+cdx)^{5/2}(e-cex)^{5/2}}{1152(1-c^2x^2)^2} - \frac{65b^2x(d+cdx)^{5/2}(e-cex)^{5/2}}{1728(1-c^2x^2)} - \frac{5bcx^2(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))}{16(1-c^2x^2)^{5/2}} + \frac{5b(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))}{48c\sqrt{1-c^2x^2}} + \frac{b(d+cdx)^{5/2}(e-cex)^{5/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} + \frac{1}{6}x(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2 + \frac{5x(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2}{16(1-c^2x^2)^2} + \frac{5x}{}$$

$$= -\frac{1}{108}b^2x(d+cdx)^{5/2}(e-cex)^{5/2} - \frac{245b^2x(d+cdx)^{5/2}(e-cex)^{5/2}}{1152(1-c^2x^2)^2} - \frac{65b^2x(d+cdx)^{5/2}(e-cex)^{5/2}}{1728(1-c^2x^2)} + \frac{115b^2(d+cdx)^{5/2}(e-cex)^{5/2}\arcsin(cx)}{1152c(1-c^2x^2)^{5/2}} - \frac{5bcx^2(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))}{16(1-c^2x^2)^{5/2}} + \frac{5b(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))}{48c\sqrt{1-c^2x^2}} + \frac{b(d+cdx)^{5/2}(e-cex)^{5/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} + \frac{1}{6}x(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2 + \frac{5x(d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2}{16(1-c^2x^2)^2} + \frac{5x}{}$$

Mathematica [A] (verified)

Time = 4.17 (sec) , antiderivative size = 450, normalized size of antiderivative = 0.90

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{d^2e^2\Big(1440b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3-4320a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\,\text{arcta}}{}$$

```
[In] Integrate[(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
[Out] (d^2*e^2*(1440*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 4320*a^2
*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 12*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*
x]*ArcSin[c*x]*(270*b*Cos[2*ArcSin[c*x]] + 27*b*Cos[4*ArcSin[c*x]] + 2*b*Co
s[6*ArcSin[c*x]] + 540*a*Sin[2*ArcSin[c*x]] + 108*a*Sin[4*ArcSin[c*x]] + 12
*a*Sin[6*ArcSin[c*x]]) + 72*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2
*(60*a + 45*b*Sin[2*ArcSin[c*x]] + 9*b*Sin[4*ArcSin[c*x]] + b*Sin[6*ArcSin[
c*x]]) + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(9504*a^2*c*x*Sqrt[1 - c^2*x^2] -
7488*a^2*c^3*x^3*Sqrt[1 - c^2*x^2] + 2304*a^2*c^5*x^5*Sqrt[1 - c^2*x^2] + 3
240*a*b*Cos[2*ArcSin[c*x]] + 324*a*b*Cos[4*ArcSin[c*x]] + 24*a*b*Cos[6*ArcS
in[c*x]] - 1620*b^2*Sin[2*ArcSin[c*x]] - 81*b^2*Sin[4*ArcSin[c*x]] - 4*b^2*
Sin[6*ArcSin[c*x]])))/(13824*c*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int (cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{5}{2}}(a+b\arcsin(cx))^2\,dx$$

```
[In] int((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
[Out] int((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [F]

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
[Out] integral((a^2*c^4*d^2*e^2*x^4 - 2*a^2*c^2*d^2*e^2*x^2 + a^2*d^2*e^2 + (b^2*
c^4*d^2*e^2*x^4 - 2*b^2*c^2*d^2*e^2*x^2 + b^2*d^2*e^2)*arcsin(c*x)^2 + 2*(a
*b*c^4*d^2*e^2*x^4 - 2*a*b*c^2*d^2*e^2*x^2 + a*b*d^2*e^2)*arcsin(c*x))*sqrt
(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(5/2)*(-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx=\int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{5/2}\,(e-c\,e\,x)^{5/2}\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2),x)
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2), x)
```

3.553 $\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 697

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx=-\frac{8b^2e(d+cdx)^{3/2}(e-cex)^{3/2}}{225c}$$

$$-\frac{1}{32}b^2ex(d+cdx)^{3/2}(e-cex)^{3/2}-\frac{16b^2e(d+cdx)^{3/2}(e-cex)^{3/2}}{75c\,(1-c^2x^2)}-\frac{15b^2ex(d+cdx)^{3/2}(e-cex)^{3/2}}{64\,(1-c^2x^2)}-\frac{2b^2e(d+$$

```
[Out] -8/225*b^2*e*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)/c-1/32*b^2*e*x*(c*d*x+d)^(3/2
)*(-c*e*x+e)^(3/2)-16/75*b^2*e*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)/c/(-c^2*x^2
+1)-15/64*b^2*e*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)/(-c^2*x^2+1)-2/125*b^2*e
*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(-c^2*x^2+1)/c+9/64*b^2*e*(c*d*x+d)^(3/2)
*(-c*e*x+e)^(3/2)*arcsin(c*x)/c/(-c^2*x^2+1)^(3/2)-2/5*b*e*x*(c*d*x+d)^(3/2
)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2)-3/8*b*c*e*x^2*(c*d*
x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2)+4/15*b*c^2
*e*x^3*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2
)-2/25*b*c^4*e*x^5*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))/(-c^2
*x^2+1)^(3/2)+1/4*e*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2+
3/8*e*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(-c^2*x^2+1)+1
/5*e*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c+1/
8*e*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^3/b/c/(-c^2*x^2+1)^(
3/2)+1/8*b*e*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))*(-c^2*x^2+1
)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 697, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.469$, Rules used = {4763, 4847, 4743, 4741, 4737, 4723, 327, 222, 4767, 201, 200, 4739, 12, 1261, 712}

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx =$$

$$-\frac{3bcex^2(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8\left(1-c^2x^2\right)^{3/2}}$$
$$+\frac{3ex(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8\left(1-c^2x^2\right)}$$
$$-\frac{2bex(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{5\left(1-c^2x^2\right)^{3/2}}$$
$$+\frac{e(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^3}{8bc\left(1-c^2x^2\right)^{3/2}}$$
$$+\frac{e\left(1-c^2x^2\right)(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{5c}$$
$$+\frac{be\sqrt{1-c^2x^2}(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8c}$$
$$+\frac{4bc^2ex^3(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{15\left(1-c^2x^2\right)^{3/2}}$$
$$-\frac{2bc^4ex^5(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{25\left(1-c^2x^2\right)^{3/2}}$$
$$+\frac{1}{4}ex(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2+\frac{9b^2e\arcsin(cx)(cdx+d)^{3/2}(e-cex)^{3/2}}{64c\left(1-c^2x^2\right)^{3/2}}-\frac{15b^2ex(cdx+d)^{3/}}{64\,(1-c}$$

```
[In] Int[(d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-8*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/(225*c) - (b^2*e*x*(d + c*d*
x)^(3/2)*(e - c*e*x)^(3/2))/32 - (16*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3
/2))/(75*c*(1 - c^2*x^2)) - (15*b^2*e*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)
)/(64*(1 - c^2*x^2)) - (2*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(1 - c^
2*x^2))/(125*c) + (9*b^2*e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*ArcSin[c*x])
/(64*c*(1 - c^2*x^2)^(3/2)) - (2*b*e*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*
(a + b*ArcSin[c*x]))/(5*(1 - c^2*x^2)^(3/2)) - (3*b*c*e*x^2*(d + c*d*x)^(3/
2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) + (4*b*c^
2*e*x^3*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(15*(1 - c
^2*x^2)^(3/2)) - (2*b*c^4*e*x^5*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*
ArcSin[c*x]))/(25*(1 - c^2*x^2)^(3/2)) + (b*e*(d + c*d*x)^(3/2)*(e - c*e*x)
^(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c) + (e*x*(d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 + (3*e*x*(d + c*d*x)^(3/2)*(e
```

```
- c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^2*x^2)) + (e*(d + c*d*x)^(3
/2)*(e - c*e*x)^(3/2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(5*c) + (e*(d +
c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*c*(1 - c^2*x^2)^
(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
```

```
x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
```

```
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\text{integral} = \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int (e-cex)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(e(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2-cex(1-c^2x^2)^{3/2}(a+b\arcsin(cx$$
$$\overline{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{\left(e(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\left(1-c^2x^2\right)^{3/2}} - \frac{\left(ce(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}ex(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{e(d+cdx)^{3/2}(e-cex)^{3/2}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2}{5c} + \frac{\left(3e(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{4\left(1-c^2x^2\right)^{3/2}} - \frac{\left(2be(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(1-c^2x^2\right)^2(a+b\arcsin(cx))\,dx}{5\left(1-c^2x^2\right)^{3/2}} - \frac{\left(bce(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{2\left(1-c^2x^2\right)^{3/2}}$$

$$= -\frac{2bex(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{5(1-c^2x^2)^{3/2}}$$
$$+\frac{4bc^2ex^3(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{15(1-c^2x^2)^{3/2}}$$
$$-\frac{2bc^4ex^5(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{25(1-c^2x^2)^{3/2}}$$
$$+\frac{be(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}$$
$$+\frac{1}{4}ex(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2+\frac{3ex(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8(1-c^2x^2)}+$$

$$= -\frac{1}{32}b^2ex(d+cdx)^{3/2}(e-cex)^{3/2}-\frac{2bex(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{5(1-c^2x^2)^{3/2}}$$
$$-\frac{3bcex^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8(1-c^2x^2)^{3/2}}$$
$$+\frac{4bc^2ex^3(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{15(1-c^2x^2)^{3/2}}$$
$$-\frac{2bc^4ex^5(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{25(1-c^2x^2)^{3/2}}$$
$$+\frac{be(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}$$
$$+\frac{1}{4}ex(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2+\frac{3ex(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8(1-c^2x^2)}+$$

$$= -\frac{1}{32}b^2ex(d+cdx)^{3/2}(e-cex)^{3/2}-\frac{15b^2ex(d+cdx)^{3/2}(e-cex)^{3/2}}{64(1-c^2x^2)}$$
$$-\frac{2bex(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{5(1-c^2x^2)^{3/2}}$$
$$-\frac{3bcex^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8(1-c^2x^2)^{3/2}}$$
$$+\frac{4bc^2ex^3(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{15(1-c^2x^2)^{3/2}}$$
$$-\frac{2bc^4ex^5(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{25(1-c^2x^2)^{3/2}}$$
$$+\frac{be(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}$$
$$+\frac{1}{4}ex(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2+\frac{3ex(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8(1-c^2x^2)}+$$

$$= -\frac{1}{32}b^2ex(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2ex(d+cdx)^{3/2}(e-cex)^{3/2}}{64(1-c^2x^2)} + \frac{9b^2e(d+cdx)^{3/2}(e-cex)^{3/2}\arcsin(cx)}{64c(1-c^2x^2)^{3/2}} - \frac{2bex(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{5(1-c^2x^2)^{3/2}} - \frac{3bcex^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8(1-c^2x^2)^{3/2}} + \frac{4bc^2ex^3(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{15(1-c^2x^2)^{3/2}} - \frac{2bc^4ex^5(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{25(1-c^2x^2)^{3/2}} + \frac{be(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{1}{4}ex(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{3ex(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8(1-c^2x^2)} + \cdots$$

$$= -\frac{8b^2e(d+cdx)^{3/2}(e-cex)^{3/2}}{225c} - \frac{1}{32}b^2ex(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{16b^2e(d+cdx)^{3/2}(e-cex)^{3/2}}{75c(1-c^2x^2)} - \frac{15b^2ex(d+cdx)^{3/2}(e-cex)^{3/2}}{64(1-c^2x^2)} - \cdots$$

Mathematica [A] (verified)

Time = 4.54 (sec) , antiderivative size = 574, normalized size of antiderivative = 0.82

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{de^2\left(36000b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 108000a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\,\mathrm{arct}\cdots\right.}{\cdots}$$

```
[In] Integrate[(d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]

[Out] (d*e^2*(36000*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108000*a^
2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 1800*b*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*ArcSin[c*x]^2*(10*b*Cos[3*ArcSin[c*x]] + 2*b*Cos[5*ArcSin[c*x]] + 5*(
12*a + 4*b*Sqrt[1 - c^2*x^2] + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSin[c*x]
])) + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(72000*a*b*Cos[2*ArcSin[c*x]] - 4000*
b^2*Cos[3*ArcSin[c*x]] + 4500*a*b*Cos[4*ArcSin[c*x]] - 288*b^2*Cos[5*ArcSin
[c*x]] - 15*(4800*b^2*Sqrt[1 - c^2*x^2] + 512*a*b*c*x*(15 - 10*c^2*x^2 + 3*
```

```
c^4*x^4) - 480*a^2*Sqrt[1 - c^2*x^2]*(8 + 25*c*x - 16*c^2*x^2 - 10*c^3*x^3
+ 8*c^4*x^4) + 2400*b^2*Sin[2*ArcSin[c*x]] + 75*b^2*Sin[4*ArcSin[c*x]])) +
60*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(1200*b*Cos[2*ArcSin[c*x]]
 + 75*b*Cos[4*ArcSin[c*x]] + 4*(-300*b*c*x + 480*a*Sqrt[1 - c^2*x^2] - 960*
a*c^2*x^2*Sqrt[1 - c^2*x^2] + 480*a*c^4*x^4*Sqrt[1 - c^2*x^2] + 600*a*Sin[2
*ArcSin[c*x]] - 50*b*Sin[3*ArcSin[c*x]] + 75*a*Sin[4*ArcSin[c*x]] - 6*b*Sin
[5*ArcSin[c*x]]))))/(288000*c*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int (cdx+d)^{\frac{3}{2}} (-cex+e)^{\frac{5}{2}} (a+b\arcsin(cx))^2\,dx$$

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [F]

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral((a^2*c^3*d*e^2*x^3 - a^2*c^2*d*e^2*x^2 - a^2*c*d*e^2*x + a^2*d*e^2
 + (b^2*c^3*d*e^2*x^3 - b^2*c^2*d*e^2*x^2 - b^2*c*d*e^2*x + b^2*d*e^2)*arcs
in(c*x)^2 + 2*(a*b*c^3*d*e^2*x^3 - a*b*c^2*d*e^2*x^2 - a*b*c*d*e^2*x + a*b*
d*e^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{5/2}\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(5/2), x)
```

3.554 $\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 613

$$\begin{aligned}
\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx &= -\frac{8b^2e^2\sqrt{d+cdx}\sqrt{e-cex}}{9c} \\
&- \frac{15}{64}b^2e^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{1}{32}b^2c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex} \\
&- \frac{4b^2e^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{27c} + \frac{15b^2e^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{64c\sqrt{1-c^2x^2}} \\
&- \frac{4be^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&- \frac{3bce^2x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&+ \frac{4bc^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&- \frac{bc^3e^2x^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&+ \frac{3}{8}e^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+ \frac{1}{4}c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+ \frac{2e^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{3c} \\
&+ \frac{5e^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] -8/9*b^2*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c-15/64*b^2*e^2*x*(c*d*x+d)^(
1/2)*(-c*e*x+e)^(1/2)-1/32*b^2*c^2*e^2*x^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)
-4/27*b^2*e^2*(-c^2*x^2+1)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+3/8*e^2*x*(a+
```

```
b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+1/4*c^2*e^2*x^3*(a+b*arcs
in(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+2/3*e^2*(-c^2*x^2+1)*(a+b*arcsi
n(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c+15/64*b^2*e^2*arcsin(c*x)*(c*d
*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c/(-c^2*x^2+1)^(1/2)-4/3*b*e^2*x*(a+b*arcsin(c
*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-3/8*b*c*e^2*x^2*(a
+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+4/9*b*c
^2*e^2*x^3*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^
(1/2)-1/8*b*c^3*e^2*x^4*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/
(-c^2*x^2+1)^(1/2)+5/24*e^2*(a+b*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^
(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.69 (sec) , antiderivative size = 613, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.406$, Rules used = {4763, 4847, 4741, 4737, 4723, 327, 222, 4767, 4739, 455, 45, 4783, 4795}

$$
\begin{aligned}
&\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{1}{4}c^2e^2x^3\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&-\frac{3bce^2x^2\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&-\frac{4be^2x\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&+\frac{5e^2\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc\sqrt{1-c^2x^2}} \\
&+\frac{2e^2(1-c^2x^2)\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2}{3c} \\
&+\frac{4bc^2e^2x^3\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&-\frac{bc^3e^2x^4\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&+\frac{3}{8}e^2x\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+\frac{15b^2e^2\arcsin(cx)\sqrt{cdx+d}\sqrt{e-cex}}{64c\sqrt{1-c^2x^2}} \\
&-\frac{1}{32}b^2c^2e^2x^3\sqrt{cdx+d}\sqrt{e-cex}-\frac{4b^2e^2(1-c^2x^2)\sqrt{cdx+d}\sqrt{e-cex}}{27c} \\
&-\frac{15}{64}b^2e^2x\sqrt{cdx+d}\sqrt{e-cex}-\frac{8b^2e^2\sqrt{cdx+d}\sqrt{e-cex}}{9c}
\end{aligned}
$$

```
[In] Int[Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-8*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c) - (15*b^2*e^2*x*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x])/64 - (b^2*c^2*e^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x])/32 - (4*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2))/(27*c)
+ (15*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(64*c*Sqrt[1 - c
^2*x^2]) - (4*b*e^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/
(3*Sqrt[1 - c^2*x^2]) - (3*b*c*e^2*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a +
 b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) + (4*b*c^2*e^2*x^3*Sqrt[d + c*d*x]*S
qrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) - (b*c^3*e^2*x^4*
Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2])
+ (3*e^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/8 + (c^2*
e^2*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/4 + (2*e^2*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c) +
 (5*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(24*b*c*Sqrt
[1 - c^2*x^2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
```

```
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
```

```
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int(e-cex)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int\left(e^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-2ce^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+c\right.}{\sqrt{1-c^2x^2}}\\
&= \frac{\left(e^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}\\
&\quad-\frac{\left(2ce^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}\\
&\quad+\frac{\left(c^2e^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}$$

$$
\begin{aligned}
&= \frac{1}{2}e^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+ \frac{1}{4}c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+ \frac{2e^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c} \\
&+ \frac{\left(e^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} \\
&- \frac{\left(4be^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int(1-c^2x^2)\,(a+b\arcsin(cx))\,dx}{3\sqrt{1-c^2x^2}} \\
&- \frac{\left(bce^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int x(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} \\
&+ \frac{\left(c^2e^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} \\
&- \frac{\left(bc^3e^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int x^3(a+b\arcsin(cx))\,dx}{2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{4be^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&- \frac{bce^2x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&+ \frac{4bc^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&- \frac{bc^3e^2x^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&+ \frac{3}{8}e^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+ \frac{1}{4}c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+ \frac{2e^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\left(a+b\arcsin(cx)\right)^2}{3c} \\
&+ \frac{e^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} \\
&+ \frac{\left(e^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} \\
&+ \frac{\left(bce^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int x(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}} \\
&+ \frac{\left(4b^2ce^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}} \\
&+ \frac{\left(b^2c^2e^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} \\
&+ \frac{\left(b^2c^4e^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{1}{4}b^2e^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{1}{32}b^2c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}$$
$$- \frac{4be^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}$$
$$- \frac{3bce^2x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}$$
$$+ \frac{4bc^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}$$
$$- \frac{bc^3e^2x^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}$$
$$+ \frac{3}{8}e^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2$$
$$+ \frac{1}{4}c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2$$
$$+ \frac{2e^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c}$$
$$+ \frac{5e^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(b^2e^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(2b^2ce^2\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}\left(\int \frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx, x, x^2\right)}{3\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(3b^2c^2e^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{32\sqrt{1-c^2x^2}}$$
$$- \frac{\left(b^2c^2e^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{15}{64}b^2e^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{1}{32}b^2c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex} \\
&+ \frac{b^2e^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} - \frac{4be^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&- \frac{3bce^2x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&+ \frac{4bc^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&- \frac{bc^3e^2x^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&+ \frac{3}{8}e^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+ \frac{1}{4}c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+ \frac{2e^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c} \\
&+ \frac{5e^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc\sqrt{1-c^2x^2}} \\
&+ \frac{\left(3b^2e^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{64\sqrt{1-c^2x^2}} - \frac{\left(b^2e^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{16\sqrt{1-c^2x^2}} \\
&+ \frac{\left(2b^2ce^2\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}\left(\int\left(\frac{2}{3\sqrt{1-c^2x}}+\frac{1}{3}\sqrt{1-c^2x}\right)\,dx,x,x^2\right)}{3\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{8b^2e^2\sqrt{d+cdx}\sqrt{e-cex}}{9c} - \frac{15}{64}b^2e^2x\sqrt{d+cdx}\sqrt{e-cex} \\
&\quad - \frac{1}{32}b^2c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex} - \frac{4b^2e^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{27c} \\
&\quad + \frac{15b^2e^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{64c\sqrt{1-c^2x^2}} \\
&\quad - \frac{4be^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&\quad - \frac{3bce^2x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&\quad + \frac{4bc^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^3e^2x^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&\quad + \frac{3}{8}e^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{4}c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad + \frac{2e^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{3c} \\
&\quad + \frac{5e^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 3.43 (sec) , antiderivative size = 555, normalized size of antiderivative = 0.91

$$
\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{1440b^2e^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 4320a^2\sqrt{d}e^{5/2}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-c}}{\sqrt{d}\sqrt{e}(-1+c^2x^2}\right.}{}
$$

```
[In] Integrate[Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (1440*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 4320*a^2*Sqrt
[d]*e^(5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/
(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 12*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*ArcSin[c*x]*(576*b*c*x - 768*a*Sqrt[1 - c^2*x^2] + 768*a*c^2*x^2*Sqrt[1 -
 c^2*x^2] - 144*b*Cos[2*ArcSin[c*x]] + 9*b*Cos[4*ArcSin[c*x]] - 288*a*Sin[2
*ArcSin[c*x]] + 64*b*Sin[3*ArcSin[c*x]] + 36*a*Sin[4*ArcSin[c*x]]) + 72*b*e
^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(60*a + 48*b*Sqrt[1 - c^2*
x^2] + 16*b*Cos[3*ArcSin[c*x]] + 24*b*Sin[2*ArcSin[c*x]] - 3*b*Sin[4*ArcSin
[c*x]]) + e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1728*a*b*Cos[2*ArcSin[c*x]]
```

```
- 256*b^2*Cos[3*ArcSin[c*x]] + 3*(-3072*a*b*c*x + 1024*a*b*c^3*x^3 + 1536*a
^2*Sqrt[1 - c^2*x^2] - 2304*b^2*Sqrt[1 - c^2*x^2] + 864*a^2*c*x*Sqrt[1 - c^
2*x^2] - 1536*a^2*c^2*x^2*Sqrt[1 - c^2*x^2] + 576*a^2*c^3*x^3*Sqrt[1 - c^2*
x^2] - 36*a*b*Cos[4*ArcSin[c*x]] - 288*b^2*Sin[2*ArcSin[c*x]] + 9*b^2*Sin[4
*ArcSin[c*x]])))/(6912*c*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int \sqrt{cdx+d}\,(-cex+e)^{\frac{5}{2}}\,(a+b\arcsin(cx))^{2}\,dx$$

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [F]

$$\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{cdx+d}(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^{2}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
[Out] integral((a^2*c^2*e^2*x^2 - 2*a^2*c*e^2*x + a^2*e^2 + (b^2*c^2*e^2*x^2 - 2*
b^2*c*e^2*x + b^2*e^2)*arcsin(c*x)^2 + 2*(a*b*c^2*e^2*x^2 - 2*a*b*c*e^2*x +
 a*b*e^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2,x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{cdx+d}(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,(e-c\,e\,x)^{5/2}\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(5/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(5/2), x)
```

3.555 $\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 559

$$\begin{aligned}\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx &= -\frac{68b^2e^3(1-c^2x^2)}{9c\sqrt{d+cdx}\sqrt{e-cex}} \\ &+\frac{3b^2e^3x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b^2e^3(1-c^2x^2)^2}{27c\sqrt{d+cdx}\sqrt{e-cex}} \\ &-\frac{3b^2e^3\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}}-\frac{22be^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{e-cex}} \\ &+\frac{3bce^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2bc^2e^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9\sqrt{d+cdx}\sqrt{e-cex}} \\ &+\frac{11e^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3c\sqrt{d+cdx}\sqrt{e-cex}}-\frac{3e^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} \\ &+\frac{ce^3x^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3\sqrt{d+cdx}\sqrt{e-cex}}+\frac{5e^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc\sqrt{d+cdx}\sqrt{e-cex}}\end{aligned}$$

```
[Out] -68/9*b^2*e^3*(-c^2*x^2+1)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+3/4*b^2*e^3*x
*(-c^2*x^2+1)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2/27*b^2*e^3*(-c^2*x^2+1)^2/
c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+11/3*e^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^
2/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-3/2*e^3*x*(-c^2*x^2+1)*(a+b*arcsin(c*x
))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/3*c*e^3*x^2*(-c^2*x^2+1)*(a+b*arcsi
n(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-3/4*b^2*e^3*arcsin(c*x)*(-c^2*x^
2+1)^(1/2)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-22/3*b*e^3*x*(a+b*arcsin(c*x)
)*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+3/2*b*c*e^3*x^2*(a+b*
arcsin(c*x))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2/9*b*c^2*
e^3*x^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/
2)+5/6*e^3*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e
*x+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 559, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.312$, Rules used = {4763, 4857, 3398, 3377, 2718, 3392, 32, 2715, 8, 2713}

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \frac{5e^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc\sqrt{cdx+d}\sqrt{e-cex}} + \frac{ce^3x^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3\sqrt{cdx+d}\sqrt{e-cex}} - \frac{3e^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{cdx+d}\sqrt{e-cex}} + \frac{11e^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3c\sqrt{cdx+d}\sqrt{e-cex}} + \frac{3bce^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{cdx+d}\sqrt{e-cex}} - \frac{22be^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3\sqrt{cdx+d}\sqrt{e-cex}} - \frac{2bc^2e^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9\sqrt{cdx+d}\sqrt{e-cex}} - \frac{3b^2e^3\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{cdx+d}\sqrt{e-cex}} + \frac{2b^2e^3(1-c^2x^2)^2}{27c\sqrt{cdx+d}\sqrt{e-cex}} + \frac{3b^2e^3x(1-c^2x^2)}{4\sqrt{cdx+d}\sqrt{e-cex}} - \frac{68b^2e^3(1-c^2x^2)}{9c\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[In] Int[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (-68*b^2*e^3*(1 - c^2*x^2))/(9*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (3*b^2*
e^3*x*(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*e^3*(1 -
c^2*x^2)^2)/(27*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*b^2*e^3*Sqrt[1 - c^
2*x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (22*b*e^3*x*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (
3*b*c*e^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]) - (2*b*c^2*e^3*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*
Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (11*e^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x]
)^2)/(3*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*e^3*x*(1 - c^2*x^2)*(a + b*
ArcSin[c*x])^2)/(2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (c*e^3*x^2*(1 - c^2*x
^2)*(a + b*ArcSin[c*x])^2)/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (5*e^3*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2718

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3377

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
-(c + d*x)^m)*(Cos[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Co
s[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3392

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[d*m*(c + d*x)^(m - 1)*((b*Sin[e + f*x])^n/(f^2*n^2)), x] + (Dist
[b^2*((n - 1)/n), Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[d
^2*m*((m - 1)/(f^2*n^2)), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[b*(c + d*x)^m*Cos[e + f*x]*((b*Sin[e + f*x])^(n - 1)/(f*n)), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 3398

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{(e-cex)^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int (a+bx)^2(ce-ce\sin(x))^3\,dx,x,\arcsin(cx)\right)}{c^4\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int \left(c^3e^3(a+bx)^2-3c^3e^3(a+bx)^2\sin(x)+3c^3e^3(a+bx)^2\sin^2(x)-c^3e^3(a+bx)^2\right.\right.}{c^4\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{e^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(e^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\sin^3(x)\,dx,x,\arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(3e^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\sin(x)\,dx,x,\arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(3e^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\sin^2(x)\,dx,x,\arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{3bce^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2bc^2e^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3e^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3e^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{ce^3x^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3\sqrt{d+cdx}\sqrt{e-cex}} + \frac{e^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2e^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)^2\sin(x)\,dx,x,\arcsin(cx)\right)}{3c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(3e^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)^2\,dx,x,\arcsin(cx)\right)}{2c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(6be^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\cos(x)\,dx,x,\arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2b^2e^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\sin^3(x)\,dx,x,\arcsin(cx)\right)}{9c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(3b^2e^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\sin^2(x)\,dx,x,\arcsin(cx)\right)}{2c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{3b^2e^3x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}} - \frac{6be^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3bce^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2bc^2e^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9\sqrt{d+cdx}\sqrt{e-cex}} + \frac{11e^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3e^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{ce^3x^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3\sqrt{d+cdx}\sqrt{e-cex}} + \frac{5e^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(4be^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\cos(x)\,dx,x,\arcsin(cx)\right)}{3c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b^2e^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(1-x^2)\,dx,x,\sqrt{1-c^2x^2}\right)}{9c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(3b^2e^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int 1\,dx,x,\arcsin(cx)\right)}{4c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(6b^2e^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\sin(x)\,dx,x,\arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{56b^2e^3(1-c^2x^2)}{9c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3b^2e^3x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b^2e^3(1-c^2x^2)^2}{27c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3b^2e^3\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{22be^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3bce^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2bc^2e^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9\sqrt{d+cdx}\sqrt{e-cex}} + \frac{11e^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3e^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{ce^3x^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3\sqrt{d+cdx}\sqrt{e-cex}} + \frac{5e^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(4b^2e^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\sin(x)\,dx,x,\arcsin(cx)\right)}{3c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{68b^2e^3(1-c^2x^2)}{9c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3b^2e^3x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b^2e^3(1-c^2x^2)^2}{27c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3b^2e^3\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{22be^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3bce^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2bc^2e^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9\sqrt{d+cdx}\sqrt{e-cex}} + \frac{11e^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3e^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{ce^3x^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3\sqrt{d+cdx}\sqrt{e-cex}} + \frac{5e^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc\sqrt{d+cdx}\sqrt{e-cex}}$$

Mathematica [A] (verified)

Time = 13.34 (sec) , antiderivative size = 473, normalized size of antiderivative = 0.85

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \frac{180b^2e^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 540a^2\sqrt{d}e^{5/2}\sqrt{1-c^2x^2}\,\text{arcta}}{}$$

```
[In] Integrate[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

```
[Out] (180*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 540*a^2*Sqrt[d
]*e^(5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(S
qrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 6*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*A
rcSin[c*x]*(264*b*c*x + 8*b*c^3*x^3 - 270*a*Sqrt[1 - c^2*x^2] + 108*a*c*x*S
qrt[1 - c^2*x^2] + 27*b*Cos[2*ArcSin[c*x]] + 6*a*Cos[3*ArcSin[c*x]]) + 18*b
*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(30*a + 45*b*Sqrt[1 - c^
2*x^2] - b*Cos[3*ArcSin[c*x]] - 9*b*Sin[2*ArcSin[c*x]]) + e^2*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(-1620*a*b*c*x + 792*a^2*Sqrt[1 - c^2*x^2] - 1620*b^2*Sq
```

```
rt[1 - c^2*x^2] - 324*a^2*c*x*Sqrt[1 - c^2*x^2] + 72*a^2*c^2*x^2*Sqrt[1 - c
^2*x^2] - 162*a*b*Cos[2*ArcSin[c*x]] + 4*b^2*Cos[3*ArcSin[c*x]] + 81*b^2*Si
n[2*ArcSin[c*x]] + 12*a*b*Sin[3*ArcSin[c*x]]))/(216*c*d*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int \frac{(-cex+e)^{\frac{5}{2}} (a+b\arcsin(cx))^2}{\sqrt{cdx+d}}dx$$

```
[In] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x)
```

```
[Out] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x)
```

Fricas [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}}\,dx$$

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral((a^2*c^2*e^2*x^2 - 2*a^2*c*e^2*x + a^2*e^2 + (b^2*c^2*e^2*x^2 - 2*
b^2*c*e^2*x + b^2*e^2)*arcsin(c*x)^2 + 2*(a*b*c^2*e^2*x^2 - 2*a*b*c*e^2*x +
 a*b*e^2)*arcsin(c*x))*sqrt(-c*e*x + e)/sqrt(c*d*x + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \text{Timed out}$$

```
[In] integrate((-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}}\,dx$$

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2/sqrt(c*d*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{5/2}}{\sqrt{d+c\,d\,x}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(1/2), x)
```

3.556 $\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 918

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{8b^2e^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{b^2e^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{b^2e^4(1-c^2x^2)^{3/2}\arcsin(cx)}{4c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{8b^2e^4x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{bce^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{8e^4(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{8e^4x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{8ie^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{4e^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{e^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{5e^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{32ibe^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{16be^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{16ib^2e^4(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{16ib^2e^4(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{8ib^2e^4(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

```
[Out] 8*a*b*e^4*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+8*b^2*e^4*(
-c^2*x^2+1)^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-1/4*b^2*e^4*x*(-c^2*x^2+1)
^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+1/4*b^2*e^4*(-c^2*x^2+1)^(3/2)*arcsin(c
*x)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+8*b^2*e^4*x*(-c^2*x^2+1)^(3/2)*arcsi
n(c*x)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-1/2*b*c*e^4*x^2*(-c^2*x^2+1)^(3/2)*
(a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*e^4*(-c^2*x^2+1)*(a+b*
arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+8*e^4*x*(-c^2*x^2+1)*(a+b
*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-32*I*b*e^4*(-c^2*x^2+1)^(3
/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+d)^(3/2)/(-
c*e*x+e)^(3/2)-4*e^4*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(
-c*e*x+e)^(3/2)+1/2*e^4*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2
)/(-c*e*x+e)^(3/2)-5/2*e^4*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*
```

```
x+d)^(3/2)/(-c*e*x+e)^(3/2)+16*I*b^2*e^4*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I
*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+16*b*e^4*(-c^2
*x^2+1)^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x
+d)^(3/2)/(-c*e*x+e)^(3/2)-16*I*b^2*e^4*(-c^2*x^2+1)^(3/2)*polylog(2,I*(I*c
*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*I*e^4*(-c^2*x^
2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*I*b^2*e
^4*(-c^2*x^2+1)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^
(3/2)/(-c*e*x+e)^(3/2)
```

Rubi [A] (verified)

Time = 0.89 (sec) , antiderivative size = 918, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.594$, Rules used = {4763, 4859, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266, 4737, 4715, 267, 4795, 4723, 327, 222}

$$
\begin{aligned}
&\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \\
&-\frac{5(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3e^4}{2bc(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{b^2x(1-c^2x^2)^2e^4}{4(cxd+d)^{3/2}(e-cex)^{3/2}}\\
&+\frac{8b^2(1-c^2x^2)^2e^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{x(1-c^2x^2)^2(a+b\arcsin(cx))^2e^4}{2(cxd+d)^{3/2}(e-cex)^{3/2}}\\
&-\frac{4(1-c^2x^2)^2(a+b\arcsin(cx))^2e^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{8i(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2e^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}\\
&+\frac{8x(1-c^2x^2)(a+b\arcsin(cx))^2e^4}{(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{8(1-c^2x^2)(a+b\arcsin(cx))^2e^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}\\
&+\frac{8abx(1-c^2x^2)^{3/2}e^4}{(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{8b^2x(1-c^2x^2)^{3/2}\arcsin(cx)e^4}{(cxd+d)^{3/2}(e-cex)^{3/2}}\\
&+\frac{b^2(1-c^2x^2)^{3/2}\arcsin(cx)e^4}{4c(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{bcx^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))e^4}{2(cxd+d)^{3/2}(e-cex)^{3/2}}\\
&-\frac{32ib(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)e^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}\\
&+\frac{16b(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)e^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}\\
&+\frac{16ib^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)e^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}\\
&-\frac{16ib^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)e^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}\\
&-\frac{8ib^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)e^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

```
[In] Int[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

```
[Out] (8*a*b*e^4*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (
8*b^2*e^4*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (b^2*e
^4*x*(1 - c^2*x^2)^2)/(4*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (b^2*e^4*(1
 - c^2*x^2)^(3/2)*ArcSin[c*x])/(4*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) +
(8*b^2*e^4*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*x
)^(3/2)) - (b*c*e^4*x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(2*(d + c*
d*x)^(3/2)*(e - c*e*x)^(3/2)) - (8*e^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*e^4*x*(1 - c^2*x^2)*(a + b*Ar
cSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*e^4*(1 - c^2*x
^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
(4*e^4*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e
*x)^(3/2)) + (e^4*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(2*(d + c*d*x)^(
3/2)*(e - c*e*x)^(3/2)) - (5*e^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^3)
/(2*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((32*I)*b*e^4*(1 - c^2*x^2)^
(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(
e - c*e*x)^(3/2)) + (16*b*e^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1
 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((16*I
)*b^2*e^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((16*I)*b^2*e^4*(1 - c^2*x^2)^(3/2)*PolyLo
g[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)
*b^2*e^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*
d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
```

```
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
```

```
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{3/2}\int \frac{(e-cex)^4(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{(1-c^2x^2)^{3/2}\int \left(\frac{8(e^4-ce^4x)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}} - \frac{7e^4(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} + \frac{4ce^4x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{c^2e^4x^2(a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\right.}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(8(1-c^2x^2)^{3/2}\right)\int \frac{(e^4-ce^4x)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(7e^4(1-c^2x^2)^{3/2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(4ce^4(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(c^2e^4(1-c^2x^2)^{3/2}\right)\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{4e^4(1-c^2x^2)^2 (a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{e^4x(1-c^2x^2)^2 (a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{7e^4(1-c^2x^2)^{3/2} (a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+ \frac{\left(8(1-c^2x^2)^{3/2}\right) \int \left(\frac{e^4(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}} - \frac{ce^4x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right) dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{\left(e^4(1-c^2x^2)^{3/2}\right) \int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} dx}{2(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+ \frac{\left(8be^4(1-c^2x^2)^{3/2}\right) \int (a+b\arcsin(cx))\, dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{\left(bce^4(1-c^2x^2)^{3/2}\right) \int x(a+b\arcsin(cx))\, dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bce^4x^2(1-c^2x^2)^{3/2} (a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{4e^4(1-c^2x^2)^2 (a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{e^4x(1-c^2x^2)^2 (a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{5e^4(1-c^2x^2)^{3/2} (a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(8e^4(1-c^2x^2)^{3/2}\right) \int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}} dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+ \frac{\left(8b^2e^4(1-c^2x^2)^{3/2}\right) \int \arcsin(cx)\, dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{\left(8ce^4(1-c^2x^2)^{3/2}\right) \int \frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}} dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(b^2c^2e^4(1-c^2x^2)^{3/2}\right) \int \frac{x^2}{\sqrt{1-c^2x^2}} dx}{2(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$
\begin{aligned}
&= \frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2e^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{8b^2e^4x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bce^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{8e^4(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8e^4x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{4e^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{e^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{5e^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(16be^4(1-c^2x^2)^{3/2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{\left(b^2e^4(1-c^2x^2)^{3/2}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(16bce^4(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{\left(8b^2ce^4(1-c^2x^2)^{3/2}\right)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8b^2e^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2e^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{b^2e^4(1-c^2x^2)^{3/2}\arcsin(cx)}{4c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8b^2e^4x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{bce^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8e^4(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{8e^4x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{e^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{5e^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{\left(16be^4(1-c^2x^2)^{3/2}\right)\operatorname{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{\left(16be^4(1-c^2x^2)^{3/2}\right)\operatorname{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8b^2e^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{b^2e^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2e^4(1-c^2x^2)^{3/2}\arcsin(cx)}{4c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{8b^2e^4x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bce^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{8e^4(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8e^4x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{8ie^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{e^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{5e^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{32ibe^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{\left(32ibe^4(1-c^2x^2)^{3/2}\right)\mathrm{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{\left(16b^2e^4(1-c^2x^2)^{3/2}\right)\mathrm{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{\left(16b^2e^4(1-c^2x^2)^{3/2}\right)\mathrm{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8b^2e^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{b^2e^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2e^4(1-c^2x^2)^{3/2}\arcsin(cx)}{4c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{8b^2e^4x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bce^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{8e^4(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8e^4x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{8ie^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{e^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{5e^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{32ibe^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{16be^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{\left(16ib^2e^4(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{\left(16ib^2e^4(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{\left(16b^2e^4(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8b^2e^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{b^2e^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2e^4(1-c^2x^2)^{3/2}\arcsin(cx)}{4c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{8b^2e^4x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bce^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{8e^4(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8e^4x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{8ie^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{e^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{5e^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{32ibe^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{16be^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{16ib^2e^4(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{16ib^2e^4(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{\left(8ib^2e^4(1-c^2x^2)^{3/2}\right)\mathrm{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{8abe^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8b^2e^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{b^2e^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2e^4(1-c^2x^2)^{3/2}\arcsin(cx)}{4c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{8b^2e^4x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bce^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{8e^4(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8e^4x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{8ie^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4e^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{e^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{5e^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{32ibe^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{16be^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{16ib^2e^4(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{16ib^2e^4(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{8ib^2e^4(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 21.90 (sec) , antiderivative size = 1642, normalized size of antiderivative = 1.79

$$
\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \frac{e^2\left(12a^2\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}(-24-7cx+c^2x^2)\left(\cos\left(\tfrac{1}{2}\operatorname{ar}\right.\right.\right.}{}
$$

```
[In] Integrate[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

```
[Out] (e^2*(12*a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(-24 - 7*c*x
 + c^2*x^2)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 180*a^2*Sqrt[d]*Sqr
t[e]*(1 + c*x)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2]) - 24*a*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(Cos[ArcSin[c*x]/2]*
(ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]
/2]]) + ((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[Ar
cSin[c*x]/2]])*Sin[ArcSin[c*x]/2]) - 8*b^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e
```

```
 - c*e*x]*((6 + 6*I)*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + I*Sin[ArcSin[c*x]/
2]) + ArcSin[c*x]^3*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (6*I)*ArcSi
n[c*x]*(Pi - (4*I)*Log[1 - I*E^(I*ArcSin[c*x])])*(Cos[ArcSin[c*x]/2] + Sin[
ArcSin[c*x]/2]) - 12*Pi*(2*Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 - I*E^(I*A
rcSin[c*x])] - 2*Log[Cos[ArcSin[c*x]/2]] - Log[Sin[(Pi + 2*ArcSin[c*x])/4]]
)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + (24*I)*PolyLog[2, I*E^(I*ArcS
in[c*x])]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) - 96*a*b*(1 + c*x)*Sqr
t[d + c*d*x]*Sqrt[e - c*e*x]*(ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSi
n[c*x]/2]) - (c*x + 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(Cos[Ar
cSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + ArcSin[c*x]*((2 + Sqrt[1 - c^2*x^2])*C
os[ArcSin[c*x]/2] + (-2 + Sqrt[1 - c^2*x^2])*Sin[ArcSin[c*x]/2])) - 16*b^2*
(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*ArcSin[c*x]^3*(Cos[ArcSin[c*x]
/2] + Sin[ArcSin[c*x]/2]) - (6*I)*ArcSin[c*x]*(Pi - I*c*x - (4*I)*Log[1 - I
*E^(I*ArcSin[c*x])])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 6*(Sqrt[1
- c^2*x^2] + 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Log[1 - I*E^(I*ArcSi
n[c*x])] - 4*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])
/4]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + (24*I)*PolyLog[2, I*E^(I*
ArcSin[c*x])]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 3*ArcSin[c*x]^2*(
((2 + 2*I) + Sqrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2] + ((-2 + 2*I) + Sqrt[1 -
 c^2*x^2])*Sin[ArcSin[c*x]/2])) - 2*b^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]*(10*ArcSin[c*x]^3*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 3*ArcS
in[c*x]*((8*I)*Pi + 16*c*x + Cos[2*ArcSin[c*x]] + 32*Log[1 - I*E^(I*ArcSin[
c*x])])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 3*(-16*Sqrt[1 - c^2*x^2
] + c*x*Sqrt[1 - c^2*x^2] - 32*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 16*Pi*Log
[1 - I*E^(I*ArcSin[c*x])] + 32*Pi*Log[Cos[ArcSin[c*x]/2]] + 16*Pi*Log[Sin[(
Pi + 2*ArcSin[c*x])/4]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + (96*I)
*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])
+ 3*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2]*((8 + 8*I) + 8*Sqrt[1 - c^2*x^2] - Si
n[2*ArcSin[c*x]]) - Sin[ArcSin[c*x]/2]*((8 - 8*I) - 8*Sqrt[1 - c^2*x^2] + S
in[2*ArcSin[c*x]]))) - 3*a*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(20*
ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 2*(16*c*x + Cos[2
*ArcSin[c*x]] + 32*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(Cos[ArcSi
n[c*x]/2] + Sin[ArcSin[c*x]/2]) + 2*ArcSin[c*x]*(24*Cos[ArcSin[c*x]/2] + 7*
Cos[(3*ArcSin[c*x])/2] + Cos[(5*ArcSin[c*x])/2] - 24*Sin[ArcSin[c*x]/2] + 7
*Sin[(3*ArcSin[c*x])/2] - Sin[(5*ArcSin[c*x])/2]))))/(24*c*d^2*(1 + c*x)*Sq
rt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]))
```

Maple [F]

$$\int \frac{(-cex+e)^{\frac{5}{2}} (a+b\arcsin{(cx)})^2}{(cdx+d)^{\frac{3}{2}}} dx$$

```
[In] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x)
[Out] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x)
```

Fricas [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}} dx = \int \frac{(-cex+e)^{\frac{5}{2}}(b\arcsin{(cx)}+a)^2}{(cdx+d)^{\frac{3}{2}}} dx$$

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="fricas")
[Out] integral((a^2*c^2*e^2*x^2 - 2*a^2*c*e^2*x + a^2*e^2 + (b^2*c^2*e^2*x^2 - 2*
b^2*c*e^2*x + b^2*e^2)*arcsin(c*x)^2 + 2*(a*b*c^2*e^2*x^2 - 2*a*b*c*e^2*x +
 a*b*e^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^2*d^2*x^2 + 2*c*
d^2*x + d^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}} dx = \text{Timed out}$$

```
[In] integrate((-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2),x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}} dx = \text{Exception raised: ValueError}$$

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \int \frac{(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{5/2}}{(d+c\,d\,x)^{3/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(3/2), x)
```

3.557 $\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 729

$$\begin{aligned}
\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx &= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{2b^2e^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{28ie^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{5e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{16b^2e^5(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{28e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{8be^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{4e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{112be^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{112ib^2e^5(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}$$

```
[Out] -2*a*b*e^5*x*(-c^2*x^2+1)^(5/2)/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2*b^2*e^5*
(-c^2*x^2+1)^3/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2*b^2*e^5*x*(-c^2*x^2+1)^
(5/2)*arcsin(c*x)/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+28/3*I*e^5*(-c^2*x^2+1)^
(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+e^5*(-c^2*x^2+
```

```
1)^3*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+5/3*e^5*(-c^2*x
^2+1)^(5/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-16/3*b
^2*e^5*(-c^2*x^2+1)^(5/2)*cot(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c
*e*x+e)^(5/2)+28/3*e^5*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/
2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-8/3*b*e^5*(-c^2*x^2+1)^(5
/2)*(a+b*arcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e
*x+e)^(5/2)-4/3*e^5*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/2*a
rcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2
)-112/3*b*e^5*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+
1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+112/3*I*b^2*e^5*(-c^2*x^2+1)^
(5/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^
(5/2)
```

Rubi [A] (verified)

Time = 0.89 (sec) , antiderivative size = 729, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {4763, 4859, 4737, 4767, 4715, 267, 4857, 3399, 4271, 3852, 8, 4269, 3798, 2221, 2317, 2438}

$$
\begin{aligned}
\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx &= \frac{5e^5\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{e^5\left(1-c^2x^2\right)^3(a+b\arcsin(cx))^2}{c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{28ie^5\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&- \frac{112be^5\left(1-c^2x^2\right)^{5/2}\log\left(1-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{28e^5\left(1-c^2x^2\right)^{5/2}\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&- \frac{8be^5\left(1-c^2x^2\right)^{5/2}\csc^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&- \frac{4e^5\left(1-c^2x^2\right)^{5/2}\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\csc^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&- \frac{2abe^5x\left(1-c^2x^2\right)^{5/2}}{(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{112ib^2e^5\left(1-c^2x^2\right)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&- \frac{2b^2e^5x\left(1-c^2x^2\right)^{5/2}\arcsin(cx)}{(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&- \frac{16b^2e^5\left(1-c^2x^2\right)^{5/2}\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5\left(1-c^2x^2\right)^3}{c(cdx+d)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

```
[In] Int[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

```
[Out] (-2*a*b*e^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) -
(2*b^2*e^5*(1 - c^2*x^2)^3)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (2*b^
2*e^5*x*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/
2)) + (((28*I)/3)*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*
d*x)^(5/2)*(e - c*e*x)^(5/2)) + (e^5*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (5*e^5*(1 - c^2*x^2)^(5/2)*(a +
b*ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (16*b^2*e^5
*(1 - c^2*x^2)^(5/2)*Cot[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e -
 c*e*x)^(5/2)) + (28*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Cot[Pi/4
 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (8*b*e^5*(1
- c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d +
 c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin
[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c
*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (112*b*e^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcS
in[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(
5/2)) + (((112*I)/3)*b^2*e^5*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c
*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4271

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> Simp[(-b^2)*(c + d*x)^m*Cot[e + f*x]*((b*Csc[e + f*x])^(n - 2)/(f*(n
- 1))), x] + (Dist[b^2*d^2*m*((m - 1)/(f^2*(n - 1)*(n - 2))), Int[(c + d*x)
^(m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[b^2*((n - 2)/(n - 1)), Int
[(c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[b^2*d*m*(c + d*x)^(m -
 1)*((b*Csc[e + f*x])^(n - 2)/(f^2*(n - 1)*(n - 2))), x]) /; FreeQ[{b, c, d
, e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(1-c^2x^2\right)^{5/2}\int\frac{(e-cex)^5(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{5/2}\int\left(\frac{5e^5(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{ce^5x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{8e^5(a+b\arcsin(cx))^2}{(1+cx)^2\sqrt{1-c^2x^2}}-\frac{12e^5(a+b\arcsin(cx))^2}{(1+cx)\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(5e^5(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(8e^5(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1+cx)^2\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(12e^5(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1+cx)\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(ce^5(1-c^2x^2)^{5/2}\right)\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{e^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(12e^5(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int \frac{(a+bx)^2}{c+c\sin(x)}\,dx, x, \arcsin(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2be^5(1-c^2x^2)^{5/2}\right)\int (a+b\arcsin(cx))\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(8ce^5(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int \frac{(a+bx)^2}{(c+c\sin(x))^2}\,dx, x, \arcsin(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2b^2e^5(1-c^2x^2)^{5/2}\right)\int \arcsin(cx)\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2e^5(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int (a+bx)^2\csc^4\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(6e^5(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int (a+bx)^2\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$
\begin{aligned}
&= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{e^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{12e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{8be^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{4e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{\left(4e^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)^2\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{\left(24be^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)\cot\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{\left(8b^2e^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\csc^2\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{\left(2b^2ce^5(1-c^2x^2)^{5/2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

$$= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{2b^2e^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{12ie^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{e^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{28e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{8be^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{4e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(16be^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)\cot\left(\frac{\pi}{4}+\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(48be^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{1-ie^{ix}}\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(16b^2e^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int 1\,dx,x,\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$
\begin{aligned}
&= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{2b^2e^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{28ie^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{e^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{16b^2e^5(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{28e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{8be^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{4e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{48be^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{\left(32be^5(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{e^{ix}(a+bx)}{1-ie^{ix}}\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{\left(48b^2e^5(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{2b^2e^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{28ie^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{e^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{16b^2e^5(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{28e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{8be^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{4e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{112be^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{\left(48ib^2e^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{\left(32b^2e^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

$$= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{2b^2e^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{28ie^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{e^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{16b^2e^5(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{28e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{8be^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{4e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{112be^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{48ib^2e^5(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(32ib^2e^5(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$
\begin{aligned}
&= -\frac{2abe^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2b^2e^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{2b^2e^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{28ie^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{e^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{16b^2e^5(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{28e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{8be^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{4e^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{112be^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{112ib^2e^5(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 2338 vs. 2(729) = 1458.

Time = 24.67 (sec) , antiderivative size = 2338, normalized size of antiderivative = 3.21

$$
\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \text{Result too large to show}
$$

```
[In] Integrate[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((a^2*e^2)/d^3 - (8*a^2*e^2)/(3*d^
3*(1 + c*x)^2) + (28*a^2*e^2)/(3*d^3*(1 + c*x))))/c - (5*a^2*e^(5/2)*ArcTan
[(c*x*Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*
(1 + c*x))])/(c*d^(5/2)) - (a*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(
d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c
*x]/2]*(-8 + 6*ArcSin[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] +
Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[
c*x] + 28*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-4 + 4*ArcSin[
c*x] + 6*ArcSin[c*x]^2 + Sqrt[1 - c^2*x^2]*(ArcSin[c*x]*(14 + 3*ArcSin[c*x]
) - 28*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - 56*Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(3*c*d^3*(-1 + c*x)*Sqrt[
```

(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - (a*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Cos[ArcSin[c*x]/2]*(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-2 + 2*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x] - 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - 2*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(3*c*d^3*(-1 + c*x)*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - (b^2*e^2*(-1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-6*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] + ((13 + 13*I)*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] + (3*ArcSin[c*x]^3)/Sqrt[1 - c^2*x^2] + 3*(-2 + ArcSin[c*x]^2) + (13*((-I)*Pi*ArcSin[c*x] - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3) - (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (2*(4 - 13*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]))))/(3*c*d^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2) - (b^2*e^2*(-1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-I)*Pi*ArcSin[c*x] + (1 + I)*ArcSin[c*x]^2 - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 - (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - (2*(-4 + ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(3*c*d^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2) + (2*b^2*e^2*(-1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((7*I)*Pi*ArcSin[c*x] - (7 + 7*I)*ArcSin[c*x]^2 - ArcSin[c*x]^3 + 28*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 14*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] - 28*Pi*Log[Cos[ArcSin[c*x]/2]] - 14*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (28*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] - (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 + (2*(-4 + 7*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(3*c*d^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^2) - (a*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(3*Cos[(5*ArcSin[c*x])/2] - 3*ArcSin[c*x]*Cos[(5*ArcSin[c*x])/2] + Cos[ArcSin[c*x]/2]*(-20 + 24*ArcSin[c*x] + 27*ArcSin[c*x]^2 - 156*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*(9 + 35*ArcSin[c*x] - 9*ArcSin[c*x]^2 + 52*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - 20*Sin[ArcSin[c*x]/2] - 24*ArcSin[c*x]*Si

```
n[ArcSin[c*x]/2] + 27*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2] - 156*Log[Cos[ArcSin
[c*x]/2] + Sin[ArcSin[c*x]/2]]*Sin[ArcSin[c*x]/2] - 9*Sin[(3*ArcSin[c*x])/2
] + 35*ArcSin[c*x]*Sin[(3*ArcSin[c*x])/2] + 9*ArcSin[c*x]^2*Sin[(3*ArcSin[c
*x])/2] - 52*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]*Sin[(3*ArcSin[c*x
])/2] + 3*Sin[(5*ArcSin[c*x])/2] + 3*ArcSin[c*x]*Sin[(5*ArcSin[c*x])/2]))/(
6*c*d^3*(-1 + c*x)*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] + Sin
[ArcSin[c*x]/2])^4)
```

Maple [F]

$$\int \frac{(-cex+e)^{\frac{5}{2}} (a+b\arcsin(cx))^2}{(cdx+d)^{\frac{5}{2}}}dx$$

```
[In] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x)
```

```
[Out] int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x)
```

Fricas [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral((a^2*c^2*e^2*x^2 - 2*a^2*c*e^2*x + a^2*e^2 + (b^2*c^2*e^2*x^2 - 2*
b^2*c*e^2*x + b^2*e^2)*arcsin(c*x)^2 + 2*(a*b*c^2*e^2*x^2 - 2*a*b*c*e^2*x +
 a*b*e^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^3*d^3*x^3 + 3*c^
2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate((-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{5/2}}{(d+c\,d\,x)^{5/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(5/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(5/2), x)
```

3.558 $\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 559

$$\begin{aligned}\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx &= \frac{68b^2d^3(1-c^2x^2)}{9c\sqrt{d+cdx}\sqrt{e-cex}} \\ &+ \frac{3b^2d^3x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2b^2d^3(1-c^2x^2)^2}{27c\sqrt{d+cdx}\sqrt{e-cex}} \\ &- \frac{3b^2d^3\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{22bd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{e-cex}} \\ &+ \frac{3bcd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2bc^2d^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9\sqrt{d+cdx}\sqrt{e-cex}} \\ &- \frac{11d^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3d^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} \\ &- \frac{cd^3x^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3\sqrt{d+cdx}\sqrt{e-cex}} + \frac{5d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc\sqrt{d+cdx}\sqrt{e-cex}}\end{aligned}$$

```
[Out] 68/9*b^2*d^3*(-c^2*x^2+1)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+3/4*b^2*d^3*x*
(-c^2*x^2+1)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2/27*b^2*d^3*(-c^2*x^2+1)^2/c
/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-11/3*d^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2
/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-3/2*d^3*x*(-c^2*x^2+1)*(a+b*arcsin(c*x)
)^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/3*c*d^3*x^2*(-c^2*x^2+1)*(a+b*arcsin
(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-3/4*b^2*d^3*arcsin(c*x)*(-c^2*x^2
+1)^(1/2)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+22/3*b*d^3*x*(a+b*arcsin(c*x))
*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+3/2*b*c*d^3*x^2*(a+b*a
rcsin(c*x))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2/9*b*c^2*d
^3*x^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2
)+5/6*d^3*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e*
x+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 559, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {4763, 4857, 3398, 3377, 2718, 3392, 32, 2715, 8, 2713}

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \frac{5d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc\sqrt{cdx+d}\sqrt{e-cex}} - \frac{cd^3x^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3\sqrt{cdx+d}\sqrt{e-cex}} - \frac{3d^3x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2\sqrt{cdx+d}\sqrt{e-cex}} - \frac{11d^3(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c\sqrt{cdx+d}\sqrt{e-cex}} + \frac{3bcd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{cdx+d}\sqrt{e-cex}} + \frac{22bd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3\sqrt{cdx+d}\sqrt{e-cex}} + \frac{2bc^2d^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9\sqrt{cdx+d}\sqrt{e-cex}} - \frac{3b^2d^3\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{cdx+d}\sqrt{e-cex}} - \frac{2b^2d^3(1-c^2x^2)^2}{27c\sqrt{cdx+d}\sqrt{e-cex}} + \frac{3b^2d^3x(1-c^2x^2)}{4\sqrt{cdx+d}\sqrt{e-cex}} + \frac{68b^2d^3(1-c^2x^2)}{9c\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] (68*b^2*d^3*(1 - c^2*x^2))/(9*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (3*b^2*d
^3*x*(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*d^3*(1 - c
^2*x^2)^2)/(27*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*b^2*d^3*Sqrt[1 - c^2
*x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (22*b*d^3*x*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (3
*b*c*d^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]) + (2*b*c^2*d^3*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]) - (11*d^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])
^2)/(3*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (3*d^3*x*(1 - c^2*x^2)*(a + b*A
rcSin[c*x])^2)/(2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (c*d^3*x^2*(1 - c^2*x^
2)*(a + b*ArcSin[c*x])^2)/(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (5*d^3*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]
)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2713

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2718

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3377

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
-(c + d*x)^m)*(Cos[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Co
s[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3392

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[d*m*(c + d*x)^(m - 1)*((b*Sin[e + f*x])^n/(f^2*n^2)), x] + (Dist
[b^2*((n - 1)/n), Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[d
^2*m*((m - 1)/(f^2*n^2)), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[b*(c + d*x)^m*Cos[e + f*x]*((b*Sin[e + f*x])^(n - 1)/(f*n)), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 3398

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(d+cdx)^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}} \\
&= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int (a+bx)^2(cd+cd\sin(x))^3\,dx,x,\arcsin(cx)\right)}{c^4\sqrt{d+cdx}\sqrt{e-cex}} \\
&= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int \left(c^3d^3(a+bx)^2+3c^3d^3(a+bx)^2\sin(x)+3c^3d^3(a+bx)^2\sin^2(x)+c^3d^3(a+bx\right.\right.}{c^4\sqrt{d+cdx}\sqrt{e-cex}} \\
&= \frac{d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad+\frac{\left(d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\sin^3(x)\,dx,x,\arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad+\frac{\left(3d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\sin(x)\,dx,x,\arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad+\frac{\left(3d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\sin^2(x)\,dx,x,\arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}$$

$$= \frac{3bcd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2bc^2d^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3d^3(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3d^3x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{cd^3x^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3\sqrt{d+cdx}\sqrt{e-cex}} + \frac{d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)^2\sin(x)\,dx,x,\arcsin(cx)\right)}{3c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(3d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)^2\,dx,x,\arcsin(cx)\right)}{2c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(6bd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\cos(x)\,dx,x,\arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b^2d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\sin^3(x)\,dx,x,\arcsin(cx)\right)}{9c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(3b^2d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\sin^2(x)\,dx,x,\arcsin(cx)\right)}{2c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{3b^2d^3x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}} + \frac{6bd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3bcd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2bc^2d^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9\sqrt{d+cdx}\sqrt{e-cex}} - \frac{11d^3(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3d^3x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{cd^3x^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3\sqrt{d+cdx}\sqrt{e-cex}} + \frac{5d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(4bd^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\cos(x)\,dx,x,\arcsin(cx)\right)}{3c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2b^2d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\left(1-x^2\right)\,dx,x,\sqrt{1-c^2x^2}\right)}{9c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(3b^2d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int 1\,dx,x,\arcsin(cx)\right)}{4c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(6b^2d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\sin(x)\,dx,x,\arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$
\begin{aligned}
&= \frac{56b^2d^3(1-c^2x^2)}{9c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3b^2d^3x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2b^2d^3(1-c^2x^2)^2}{27c\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad - \frac{3b^2d^3\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{22bd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad + \frac{3bcd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2bc^2d^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad - \frac{11d^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3d^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad - \frac{cd^3x^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3\sqrt{d+cdx}\sqrt{e-cex}} + \frac{5d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad - \frac{\left(4b^2d^3\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\sin(x)\,dx,x,\arcsin(cx)\right)}{3c\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{68b^2d^3(1-c^2x^2)}{9c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{3b^2d^3x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2b^2d^3(1-c^2x^2)^2}{27c\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad - \frac{3b^2d^3\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{22bd^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad + \frac{3bcd^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2bc^2d^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad - \frac{11d^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3d^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad - \frac{cd^3x^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3\sqrt{d+cdx}\sqrt{e-cex}} + \frac{5d^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 9.93 (sec) , antiderivative size = 434, normalized size of antiderivative = 0.78

$$
\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx =
$$

$$
-\frac{d^2\left(-180b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 + 540a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right) - 6b\sqrt{d+cd}\right.}{}
$$

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] -1/216*(d^2*(-180*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 + 540*a
^2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*ArcSin[c*x]*(-18*b + 264*b*c*x + 36*b*c^2*x^2 + 8*b*c^3*x^3 - 270*a*Sqr
t[1 - c^2*x^2] - 108*a*c*x*Sqrt[1 - c^2*x^2] - 9*b*Cos[2*ArcSin[c*x]] + 6*a
*Cos[3*ArcSin[c*x]]) + 18*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(
```

```
-30*a + 9*b*(5 + 2*c*x)*Sqrt[1 - c^2*x^2] - b*Cos[3*ArcSin[c*x]]) + Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x]*(6*(-27*b^2*(10 + c*x)*Sqrt[1 - c^2*x^2] - 8*a*b*c
*x*(33 + c^2*x^2) + 6*a^2*Sqrt[1 - c^2*x^2]*(22 + 9*c*x + 2*c^2*x^2)) + 162
*a*b*Cos[2*ArcSin[c*x]] + 4*b^2*Cos[3*ArcSin[c*x]])))/(c*e*Sqrt[1 - c^2*x^2
])
```

Maple [F]

$$\int \frac{(cdx+d)^{\frac{5}{2}} (a+b\arcsin{(cx)})^2}{\sqrt{-cex+e}}dx$$

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

Fricas [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin{(cx)}+a)^2}{\sqrt{-cex+e}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c^2*d^2*x^2 + 2*a^2*c*d^2*x + a^2*d^2 + (b^2*c^2*d^2*x^2 + 2
*b^2*c*d^2*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x
+ a*b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c*e*x - e), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{\sqrt{-cex+e}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)^2/sqrt(-c*e*x + e), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{5/2}}{\sqrt{e-c\,e\,x}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(5/2))/(e - c*e*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(5/2))/(e - c*e*x)^(1/2), x)
```

3.559 $\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 398

$$
\begin{aligned}
\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx &= \frac{4b^2d^2(1-c^2x^2)}{c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{b^2d^2x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}} \\
&-\frac{b^2d^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{4bd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{\sqrt{d+cdx}\sqrt{e-cex}} \\
&+\frac{bcd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}} \\
&-\frac{d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}}+\frac{d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}
$$

```
[Out] 4*b^2*d^2*(-c^2*x^2+1)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/4*b^2*d^2*x*(-c
^2*x^2+1)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*d^2*(-c^2*x^2+1)*(a+b*arcsin(c
*x))^2/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/2*d^2*x*(-c^2*x^2+1)*(a+b*arcsi
n(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/4*b^2*d^2*arcsin(c*x)*(-c^2*x^
2+1)^(1/2)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+4*b*d^2*x*(a+b*arcsin(c*x))*(
-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/2*b*c*d^2*x^2*(a+b*arc
sin(c*x))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/2*d^2*(a+b*
arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 398, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.281, Rules used = {4763, 4857, 3398, 3377, 2718, 3392, 32, 2715, 8}

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \frac{d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc\sqrt{cdx+d}\sqrt{e-cex}} - \frac{2d^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c\sqrt{cdx+d}\sqrt{e-cex}} - \frac{d^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2\sqrt{cdx+d}\sqrt{e-cex}} + \frac{bcd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{cdx+d}\sqrt{e-cex}} + \frac{4bd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{\sqrt{cdx+d}\sqrt{e-cex}} - \frac{b^2d^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{cdx+d}\sqrt{e-cex}} + \frac{4b^2d^2(1-c^2x^2)}{c\sqrt{cdx+d}\sqrt{e-cex}} + \frac{b^2d^2x(1-c^2x^2)}{4\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] (4*b^2*d^2*(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*d^2*x*
(1 - c^2*x^2))/(4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (b^2*d^2*Sqrt[1 - c^2*
x^2]*ArcSin[c*x])/(4*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (4*b*d^2*x*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x]))/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b*c*d
^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]) - (2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]) - (d^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*Sqrt[d + c*d
*x]*Sqrt[e - c*e*x]) + (d^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(2*b*c
*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2715

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Sin[c + d*x])^(n - 1)/(d*n)), x] + Dist[b^2*((n - 1)/n), Int[(b*Sin[
c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2
*n]
```

Rule 2718

```
Int[sin[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-Cos[c + d*x]/d, x] /; FreeQ
[{c, d}, x]
```

Rule 3377

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[(
-(c + d*x)^m)*(Cos[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Co
s[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3392

```
Int[((c_.) + (d_.)*(x_))^(m_)*((b_.)*sin[(e_.) + (f_.)*(x_)])^(n_), x_Symbo
l] :> Simp[d*m*(c + d*x)^(m - 1)*((b*Sin[e + f*x])^n/(f^2*n^2)), x] + (Dist
[b^2*((n - 1)/n), Int[(c + d*x)^m*(b*Sin[e + f*x])^(n - 2), x], x] - Dist[d
^2*m*((m - 1)/(f^2*n^2)), Int[(c + d*x)^(m - 2)*(b*Sin[e + f*x])^n, x], x]
- Simp[b*(c + d*x)^m*Cos[e + f*x]*((b*Sin[e + f*x])^(n - 1)/(f*n)), x]) /;
FreeQ[{b, c, d, e, f}, x] && GtQ[n, 1] && GtQ[m, 1]
```

Rule 3398

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int\frac{(d+cdx)^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int (a+bx)^2(cd+cd\sin(x))^2\,dx, x, \arcsin(cx)\right)}{c^3\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int \left(c^2d^2(a+bx)^2+2c^2d^2(a+bx)^2\sin(x)+c^2d^2(a+bx)^2\sin^2(x)\right)\,dx, x, \arcsin(c\right.}{c^3\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(d^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\sin^2(x)\,dx, x, \arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2d^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\sin(x)\,dx, x, \arcsin(cx)\right)}{c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{bcd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(d^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)^2\,dx, x, \arcsin(cx)\right)}{2c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(4bd^2\sqrt{1-c^2x^2}\right)\text{Subst}(\int (a+bx)\cos(x)\,dx, x, \arcsin(cx))}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(b^2d^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \sin^2(x)\,dx, x, \arcsin(cx)\right)}{2c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{b^2d^2x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4bd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{bcd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(b^2d^2\sqrt{1-c^2x^2}\right)\text{Subst}(\int 1\,dx, x, \arcsin(cx))}{4c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(4b^2d^2\sqrt{1-c^2x^2}\right)\text{Subst}(\int \sin(x)\,dx, x, \arcsin(cx))}{c\sqrt{d+cdx}\sqrt{e-cex}}$$

$$
\begin{aligned}
&= \frac{4b^2d^2(1-c^2x^2)}{c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{b^2d^2x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad - \frac{b^2d^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4bd^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad + \frac{bcd^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad - \frac{d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{d^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 5.76 (sec) , antiderivative size = 344, normalized size of antiderivative = 0.86

$$
\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \frac{bd\sqrt{d+cdx}\sqrt{e-cex}\left(-4a(4+cx)\sqrt{1-c^2x^2}+b(-1+16cx+2c^2x^2\right.}{}
$$

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] (b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-4*a*(4 + c*x)*Sqrt[1 - c^2*x^2] + b*
(-1 + 16*c*x + 2*c^2*x^2))*ArcSin[c*x] - 2*b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(-3*a + b*(4 + c*x)*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*b^2*d*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 6*a^2*d^(3/2)*Sqrt[e]*Sqrt[1 - c^2*
x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^
2*x^2))] + d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(16*a*b*c*x - 2*a^2*(4 + c*x)*
Sqrt[1 - c^2*x^2] + b^2*(16 + c*x)*Sqrt[1 - c^2*x^2] - a*b*Cos[2*ArcSin[c*x
]]))/(4*c*e*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$
\int \frac{(cdx+d)^{\frac{3}{2}}(a+b\arcsin(cx))^2}{\sqrt{-cex+e}}\,dx
$$

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

Fricas [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{\sqrt{-cex+e}}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c*d*x + a^2*d + (b^2*c*d*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*c
*d*x + a*b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c*e*x - e), x)
```

Sympy [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \int \frac{(d(cx+1))^{\frac{3}{2}}\,(a+b\operatorname{asin}(cx))^2}{\sqrt{-e\,(cx-1)}}\,dx$$

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((d*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/sqrt(-e*(c*x - 1)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{\sqrt{-cex+e}}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)^2/sqrt(-c*e*x + e), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}}{\sqrt{e-c\,e\,x}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2))/(e - c*e*x)^(1/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2))/(e - c*e*x)^(1/2), x)
```

3.560 $\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 231

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b^2d(1-c^2x^2)}{c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b^2dx\sqrt{1-c^2x^2}\arcsin(cx)}{\sqrt{d+cdx}\sqrt{e-cex}} - \frac{d(1-c^2x^2)\left(a+b\arcsin(cx)\right)^2}{c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{d\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}$$

```
[Out] 2*b^2*d*(-c^2*x^2+1)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-d*(-c^2*x^2+1)*(a+b
*arcsin(c*x))^2/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*a*b*d*x*(-c^2*x^2+1)^(
1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*b^2*d*x*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/3*d*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)
^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 231, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used

$= \{4763, 4847, 4737, 4767, 4715, 267\}$

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \frac{d\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{cdx+d}\sqrt{e-cex}} - \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c\sqrt{cdx+d}\sqrt{e-cex}} + \frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{cdx+d}\sqrt{e-cex}} + \frac{2b^2dx\sqrt{1-c^2x^2}\arcsin(cx)}{\sqrt{cdx+d}\sqrt{e-cex}} + \frac{2b^2d(1-c^2x^2)}{c\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] (2*a*b*d*x*Sqrt[1 - c^2*x^2])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*d*
(1 - c^2*x^2))/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*d*x*Sqrt[1 - c^
2*x^2]*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (d*(1 - c^2*x^2)*(a
 + b*ArcSin[c*x])^2)/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (d*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int\frac{(d+cdx)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= \frac{\sqrt{1-c^2x^2}\int\left(\frac{d(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{cdx(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= \frac{\left(d\sqrt{1-c^2x^2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{\left(cd\sqrt{1-c^2x^2}\right)\int\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= -\frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{d\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}\\
&\quad+\frac{\left(2bd\sqrt{1-c^2x^2}\right)\int(a+b\arcsin(cx))\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= \frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}}\\
&\quad+\frac{d\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}+\frac{\left(2b^2d\sqrt{1-c^2x^2}\right)\int\arcsin(cx)\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= \frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b^2dx\sqrt{1-c^2x^2}\arcsin(cx)}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}}\\
&\quad+\frac{d\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}-\frac{\left(2b^2cd\sqrt{1-c^2x^2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= \frac{2abdx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b^2d(1-c^2x^2)}{c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b^2dx\sqrt{1-c^2x^2}\arcsin(cx)}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&\quad-\frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{d\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 2.32 (sec) , antiderivative size = 298, normalized size of antiderivative = 1.29

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx$$
$$= \frac{3\sqrt{d+cdx}\sqrt{e-cex}\left(2abcx-a^2\sqrt{1-c^2x^2}+2b^2\sqrt{1-c^2x^2}\right)+6b\sqrt{d+cdx}\sqrt{e-cex}\left(bcx-a\sqrt{1-c^2x^2}\right)\text{a}}{}$$

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/Sqrt[e - c*e*x],x]
```

```
[Out] (3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*a*b*c*x - a^2*Sqrt[1 - c^2*x^2] + 2*b
^2*Sqrt[1 - c^2*x^2]) + 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(b*c*x - a*Sqrt
[1 - c^2*x^2])*ArcSin[c*x] + 3*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a - b*Sqr
t[1 - c^2*x^2])*ArcSin[c*x]^2 + b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[
c*x]^3 - 3*a^2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))])/(3*c*e*Sqrt[1 - c^2*x
^2])
```

Maple [F]

$$\int \frac{\sqrt{cdx+d}\,(a+b\arcsin(cx))^2}{\sqrt{-cex+e}}dx$$

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x)
```

Fricas [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \int \frac{\sqrt{cdx+d}(b\arcsin(cx)+a)^2}{\sqrt{-cex+e}}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c*e*x - e), x)
```

Sympy [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \int \frac{\sqrt{d\,(cx+1)}(a+b\operatorname{asin}{(cx)})^2}{\sqrt{-e\,(cx-1)}}\,dx$$

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(1/2),x)
[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))**2/sqrt(-e*(c*x - 1)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \int \frac{\sqrt{cdx+d}(b\arcsin{(cx)}+a)^2}{\sqrt{-cex+e}}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(1/2),x, algorithm
="giac")
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)^2/sqrt(-c*e*x + e), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{\sqrt{e-cex}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}}{\sqrt{e-c\,e\,x}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2))/(e - c*e*x)^(1/2),x)
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2))/(e - c*e*x)^(1/2), x)
```

3.561 $\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 55

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}$$

```
[Out] 1/3*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(
1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.062$, Rules used = {4763, 4737}

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\ &= \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}\end{aligned}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 159 vs. 2(55) = 110.

Time = 2.67 (sec) , antiderivative size = 159, normalized size of antiderivative = 2.89

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \frac{\frac{3ab\sqrt{1-c^2x^2}\arcsin(cx)^2}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)^3}{\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3a^2\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right)}{\sqrt{d}\sqrt{e}}}{3c}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] ((3*a*b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
+ (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^3)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) -
 (3*a^2*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 +
 c^2*x^2))])/(Sqrt[d]*Sqrt[e]))/(3*c)
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\,\sqrt{-cex+e}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}\sqrt{-cex+e}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^2*d*e*x^2 - d*e), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2}{\sqrt{d\,(cx+1)}\sqrt{-e\,(cx-1)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}\sqrt{-cex+e}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)), x)
```

3.562 $\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 455

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx &= -\frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{ie(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{4ibe(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{2be(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{2ib^2e(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{2ib^2e(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{ib^2e(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}\end{aligned}$$

```
[Out] -e*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+e*x*
(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*e*(-c^2
*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*I*b*
e*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(
c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*b*e*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*
ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*I*b
^2*e*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d
)^(3/2)/(-c*e*x+e)^(3/2)-2*I*b^2*e*(-c^2*x^2+1)^(3/2)*polylog(2,I*(I*c*x+(-
c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*b^2*e*(-c^2*x^2+1)^
```

```
(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)
^(3/2)
```

Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 455, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.344$, Rules used = {4763, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266}

$$\begin{aligned}
&\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx = \\
&-\frac{4ibe(1-c^2x^2)^{3/2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
&-\frac{ie(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
&-\frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}+\frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}} \\
&+\frac{2be(1-c^2x^2)^{3/2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
&+\frac{2ib^2e(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
&-\frac{2ib^2e(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
&-\frac{ib^2e(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}
\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*Sqrt[e - c*e*x]),x]
```

```
[Out] -((e*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^
(3/2))) + (e*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2)) - (I*e*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*
d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*b*e*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
n[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
+ (2*b*e*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*
x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((2*I)*b^2*e*(1 - c^2*x^2)^
(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^
(3/2)) - ((2*I)*b^2*e*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/
(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*e*(1 - c^2*x^2)^(3/2)*Poly
Log[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(1-c^2x^2)^{3/2}\int \frac{(e-cex)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{(1-c^2x^2)^{3/2}\int \left(\frac{e(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}-\frac{cex(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{\left(e(1-c^2x^2)^{3/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{\left(ce(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= -\frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad +\frac{\left(2be(1-c^2x^2)^{3/2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{\left(2bce(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}$$

$$=-\frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{\left(2be(1-c^2x^2)^{3/2}\right)\operatorname{Subst}(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx))}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{\left(2be(1-c^2x^2)^{3/2}\right)\operatorname{Subst}(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx))}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$=-\frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{ie(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{4ibe(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{\left(4ibe(1-c^2x^2)^{3/2}\right)\operatorname{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{\left(2b^2e(1-c^2x^2)^{3/2}\right)\operatorname{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{\left(2b^2e(1-c^2x^2)^{3/2}\right)\operatorname{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$=-\frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{ie(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{4ibe(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{2be(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{\left(2ib^2e(1-c^2x^2)^{3/2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{\left(2ib^2e(1-c^2x^2)^{3/2}\right)\operatorname{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{\left(2b^2e(1-c^2x^2)^{3/2}\right)\operatorname{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{e(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{ex(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{ie(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{4ibe(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+ \frac{2be(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+ \frac{2ib^2e(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{2ib^2e(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+ \frac{\left(ib^2e(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{e(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{ex(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{ie(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{4ibe(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+ \frac{2be(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+ \frac{2ib^2e(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{2ib^2e(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{ib^2e(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

Mathematica [A] (verified)

Time = 2.72 (sec) , antiderivative size = 225, normalized size of antiderivative = 0.49

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx =$$
$$-\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(-b^2\sqrt{1-c^2x^2}\arcsin(cx)^2\left(-i+\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\right)+2b\sqrt{1-c^2x^2}\arcsin(cx)\,(\right.}{}$$

[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*Sqrt[e - c*e*x]),x]

[Out] -((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-(b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2*(-I + Cot[(Pi + 2*ArcSin[c*x])/4])) + 2*b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(-(a*Cot[(Pi + 2*ArcSin[c*x])/4]) + 2*b*Log[1 + I/E^(I*ArcSin[c*x])]) + a*(-a + a*c*x + 4*b*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]) + (4*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)/E^(I*ArcSin[c*x])]))/(c*d^2*e*(-1 + c*x)*(1 + c*x)))

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{3}{2}}\sqrt{-cex+e}}dx$$

[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x)

[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x)

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}\sqrt{-cex+e}}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x, algorithm="fricas")

[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^3*d^2*e*x^3 + c^2*d^2*e*x^2 - c*d^2*e*x - d^2*e), x)

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2}{(d\,(cx+1))^{\frac{3}{2}}\,\sqrt{-e\,(cx-1)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(1/2),x)
[Out] Integral((a + b*asin(c*x))**2/((d*(c*x + 1))**(3/2)*sqrt(-e*(c*x - 1))), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin\,(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}\sqrt{-cex+e}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x, algorithm
="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*sqrt(-c*e*x + e)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{3/2}\,\sqrt{e-c\,e\,x}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(1/2)),x)
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(1/2)), x)
```

3.563 $\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 896

$$\begin{aligned}
\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx &= -\frac{2b^2e^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{2b^2e^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b^2e^2(1-c^2x^2)^{5/2}\arcsin(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{be^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2be^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{bce^2x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2e^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{2e^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{ie^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{4ibe^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{2be^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{2ib^2e^2(1-c^2x^2)^{5/2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{2ib^2e^2(1-c^2x^2)^{5/2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{ib^2e^2(1-c^2x^2)^{5/2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}$$

```
[Out] -2/3*b^2*e^2*(-c^2*x^2+1)^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*b^2*e^2*
x*(-c^2*x^2+1)^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b^2*e^2*(-c^2*x^2+1)^
(5/2)*arcsin(c*x)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*e^2*(-c^2*x^2+1)
^(3/2)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*b*e^2*x*(-c
^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*c*
e^2*x^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/
2)-2/3*e^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5
/2)+1/3*e^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(
5/2)+1/3*c^2*e^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e
*x+e)^(5/2)+2/3*e^2*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-
c*e*x+e)^(5/2)-1/3*I*e^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)
^(5/2)/(-c*e*x+e)^(5/2)-1/3*I*b^2*e^2*(-c^2*x^2+1)^(5/2)*polylog(2,-(I*c*x+
(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*b*e^2*(-c^2*x
^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/((c*d*x+d
)^(5/2)/(-c*e*x+e)^(5/2)-4/3*I*b*e^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*a
rctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*I*b^
2*e^2*(-c^2*x^2+1)^(5/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+
d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*b^2*e^2*(-c^2*x^2+1)^(5/2)*polylog(2,I*(I*c
*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)
```

Rubi [A] (verified)

Time = 0.83 (sec) , antiderivative size = 896, normalized size of antiderivative = 1.00, number of steps used = 30, number of rules used = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.562$, Rules used = {4763, 4847, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 4749, 4266, 267,

4771, 4791, 294, 222}

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx = \frac{c^2e^2(1-c^2x^2)\,(a+b\arcsin(cx))^2x^3}{3(cxd+d)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{bce^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))x^2}{3(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{2b^2e^2(1-c^2x^2)^2\,x}{3(cxd+d)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{2e^2(1-c^2x^2)^2\,(a+b\arcsin(cx))^2x}{3(cxd+d)^{5/2}(e-cex)^{5/2}}+\frac{e^2(1-c^2x^2)\,(a+b\arcsin(cx))^2x}{3(cxd+d)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{2be^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))x}{3(cxd+d)^{5/2}(e-cex)^{5/2}}-\frac{2b^2e^2(1-c^2x^2)^2}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{ie^2(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}-\frac{2e^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{b^2e^2(1-c^2x^2)^{5/2}\arcsin(cx)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}-\frac{be^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{4ibe^2(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{2be^2(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{2ib^2e^2(1-c^2x^2)^{5/2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{2ib^2e^2(1-c^2x^2)^{5/2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{ib^2e^2(1-c^2x^2)^{5/2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*Sqrt[e - c*e*x]),x]
```

```
[Out] (-2*b^2*e^2*(1 - c^2*x^2)^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2
*b^2*e^2*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b^2*
e^2*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/
2)) - (b*e^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2
)*(e - c*e*x)^(5/2)) + (2*b*e^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/
(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*c*e^2*x^2*(1 - c^2*x^2)^(3/2)*
(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (2*e^2*(1 -
c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) +
 (e^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*
x)^(5/2)) + (c^2*e^2*x^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x
)^(5/2)*(e - c*e*x)^(5/2)) + (2*e^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2
)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - ((I/3)*e^2*(1 - c^2*x^2)^(5/2)*
(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((4*I)/3)
*b*e^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(
```

```
c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*b*e^2*(1 - c^2*x^2)^(5/2)*(a +
b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e -
c*e*x)^(5/2)) + (((2*I)/3)*b^2*e^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I
*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((2*I)/3)*b^2*e^
2*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)
*(e - c*e*x)^(5/2)) - ((I/3)*b^2*e^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*
I)*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 294

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(
n - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*n*(p + 1))), x] - Dist[c^n
*((m - n + 1)/(b*n*(p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
```

```
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int \frac{(e-cex)^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{(1-c^2x^2)^{5/2}\int \left(\frac{e^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}} - \frac{2ce^2x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}} + \frac{c^2e^2x^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(e^2(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2ce^2(1-c^2x^2)^{5/2}\right)\int \frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(c^2e^2(1-c^2x^2)^{5/2}\right)\int \frac{x^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2e^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2e^2(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(4be^2(1-c^2x^2)^{5/2}\right)\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2bce^2(1-c^2x^2)^{5/2}\right)\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2bc^3e^2(1-c^2x^2)^{5/2}\right)\int \frac{x^3(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{be^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2be^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bce^2x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2e^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2e^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2be^2(1-c^2x^2)^{5/2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(b^2e^2(1-c^2x^2)^{5/2}\right)\int \frac{1}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2bce^2(1-c^2x^2)^{5/2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(4bce^2(1-c^2x^2)^{5/2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2b^2ce^2(1-c^2x^2)^{5/2}\right)\int \frac{x}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(b^2c^2e^2(1-c^2x^2)^{5/2}\right)\int \frac{x^2}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$
\begin{aligned}
&= -\frac{2b^2e^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2e^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{be^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2be^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{bce^2x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2e^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2e^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(b^2e^2(1-c^2x^2)^{5/2}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{\left(2be^2(1-c^2x^2)^{5/2}\right)\text{Subst}(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{\left(2be^2(1-c^2x^2)^{5/2}\right)\text{Subst}(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{\left(4be^2(1-c^2x^2)^{5/2}\right)\text{Subst}(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{2b^2e^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2e^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad -\frac{b^2e^2(1-c^2x^2)^{5/2}\arcsin(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{be^2(1-c^2x^2)^{3/2}\left(a+b\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad +\frac{2be^2x(1-c^2x^2)^{3/2}\left(a+b\arcsin(cx)\right)}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad -\frac{bce^2x^2(1-c^2x^2)^{3/2}\left(a+b\arcsin(cx)\right)}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{2e^2(1-c^2x^2)\left(a+b\arcsin(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad +\frac{e^2x(1-c^2x^2)\left(a+b\arcsin(cx)\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{c^2e^2x^3(1-c^2x^2)\left(a+b\arcsin(cx)\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad +\frac{2e^2x(1-c^2x^2)^2\left(a+b\arcsin(cx)\right)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{ie^2(1-c^2x^2)^{5/2}\left(a+b\arcsin(cx)\right)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad -\frac{4ibe^2(1-c^2x^2)^{5/2}\left(a+b\arcsin(cx)\right)\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad -\frac{\left(4ibe^2(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad +\frac{\left(8ibe^2(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad -\frac{\left(2b^2e^2(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad +\frac{\left(2b^2e^2(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

$$= -\frac{2b^2e^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2e^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{b^2e^2(1-c^2x^2)^{5/2}\arcsin(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{2be^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{bce^2x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2e^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{2e^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{ie^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{4ibe^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{2be^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(2ib^2e^2(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(2ib^2e^2(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(2b^2e^2(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(4b^2e^2(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$
\begin{aligned}
&= -\frac{2b^2e^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2e^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{b^2e^2(1-c^2x^2)^{5/2}\arcsin(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2be^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{bce^2x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2e^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2e^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{ie^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{4ibe^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2be^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2ib^2e^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{2ib^2e^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{\left(ib^2e^2(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{\left(2ib^2e^2(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{2b^2e^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2e^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{b^2e^2(1-c^2x^2)^{5/2}\arcsin(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2be^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{bce^2x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2e^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2e^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{ie^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{4ibe^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2be^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2ib^2e^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{2ib^2e^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{ib^2e^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 8.37 (sec) , antiderivative size = 369, normalized size of antiderivative = 0.41

$$
\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx = -\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(\frac{2a^2(2+cx)}{(1+cx)^2} + \frac{b^2\left(\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\left(4+\arcsin(cx)^2\left(2+\csc^2\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\right)\right)+2\arcsin(cx)(-i\arcsin(cx)+\cdots}{\sqrt{1-c^2x^2}}\cdots\right)}{\cdots}
$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*Sqrt[e - c*e*x]),x]
```

```
[Out] -1/6*(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((2*a^2*(2 + c*x))/(1 + c*x)^2 + (b^2
*(Cot[(Pi + 2*ArcSin[c*x])/4]*(4 + ArcSin[c*x]^2*(2 + Csc[(Pi + 2*ArcSin[c*
x])/4]^2)) + 2*ArcSin[c*x]*((-I)*ArcSin[c*x] + Csc[(Pi + 2*ArcSin[c*x])/4]^
2 - 4*Log[1 + I/E^(I*ArcSin[c*x])]) - (8*I)*PolyLog[2, (-I)/E^(I*ArcSin[c*x
])]))/Sqrt[1 - c^2*x^2] + (2*a*b*(Cos[ArcSin[c*x]/2]*(2 + 3*ArcSin[c*x] - 6
*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*(Ar
```

```
cSin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(1 + (-1 +
Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 2*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c
*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[
ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3)))/(c*d^3*e)
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{5}{2}}\sqrt{-cex+e}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}\sqrt{-cex+e}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^4*d^3*e*x^4 + 2*c^3*d^3*e*x^3 - 2*c*d^3*e*x - d^3*e), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2}{(d\,(cx+1))^{\frac{5}{2}}\sqrt{-e\,(cx-1)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(5/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/((d*(c*x + 1))**(5/2)*sqrt(-e*(c*x - 1))), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}\sqrt{-cex+e}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(5/2)*sqrt(-c*e*x + e)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{5/2}\,\sqrt{e-c\,e\,x}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(1/2)), x)
```

3.564 $\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 918

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2d^4(1-c^2x^2)^{3/2}\arcsin(cx)}{4c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bcd^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8d^4(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8d^4x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8id^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{5d^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{32ibd^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{16bd^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{16ib^2d^4(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{16ib^2d^4(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8ib^2d^4(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

```
[Out] -8*a*b*d^4*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*b^2*d^4*
(-c^2*x^2+1)^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-1/4*b^2*d^4*x*(-c^2*x^2+1
)^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+1/4*b^2*d^4*(-c^2*x^2+1)^(3/2)*arcsin(
c*x)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*b^2*d^4*x*(-c^2*x^2+1)^(3/2)*arcs
in(c*x)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-1/2*b*c*d^4*x^2*(-c^2*x^2+1)^(3/2)
*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+8*d^4*(-c^2*x^2+1)*(a+b
*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+8*d^4*x*(-c^2*x^2+1)*(a+
b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+32*I*b*d^4*(-c^2*x^2+1)^(
3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+d)^(3/2)/(
-c*e*x+e)^(3/2)+4*d^4*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/
(-c*e*x+e)^(3/2)+1/2*d^4*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/
2)/(-c*e*x+e)^(3/2)-5/2*d^4*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^3/b/c/(c*d
```

```
*x+d)^(3/2)/(-c*e*x+e)^(3/2)+16*I*b^2*d^4*(-c^2*x^2+1)^(3/2)*polylog(2,I*(I
*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+16*b*d^4*(-c^2
*x^2+1)^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x
+d)^(3/2)/(-c*e*x+e)^(3/2)-16*I*b^2*d^4*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*
c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*I*d^4*(-c^2*x
^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*I*b^2*
d^4*(-c^2*x^2+1)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)
^(3/2)/(-c*e*x+e)^(3/2)
```

Rubi [A] (verified)

Time = 0.84 (sec) , antiderivative size = 918, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.594$, Rules used = {4763, 4859, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266, 4737, 4715, 267, 4795, 4723, 327, 222}

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx =$$

$$-\frac{5(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3d^4}{2bc(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{b^2x(1-c^2x^2)^2d^4}{4(cxd+d)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{8b^2(1-c^2x^2)^2d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{x(1-c^2x^2)^2(a+b\arcsin(cx))^2d^4}{2(cxd+d)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{4(1-c^2x^2)^2(a+b\arcsin(cx))^2d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{8i(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{8x(1-c^2x^2)(a+b\arcsin(cx))^2d^4}{(cxd+d)^{3/2}(e-cex)^{3/2}}+\frac{8(1-c^2x^2)(a+b\arcsin(cx))^2d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{8abx(1-c^2x^2)^{3/2}d^4}{(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{8b^2x(1-c^2x^2)^{3/2}\arcsin(cx)d^4}{(cxd+d)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{b^2(1-c^2x^2)^{3/2}\arcsin(cx)d^4}{4c(cxd+d)^{3/2}(e-cex)^{3/2}}-\frac{bcx^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))d^4}{2(cxd+d)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{32ib(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{16b(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{16ib^2(1-c^2x^2)^{3/2}\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{16ib^2(1-c^2x^2)^{3/2}\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{8ib^2(1-c^2x^2)^{3/2}\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)d^4}{c(cxd+d)^{3/2}(e-cex)^{3/2}}$$

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```

```
[Out] (-8*a*b*d^4*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
(8*b^2*d^4*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (b^2*
d^4*x*(1 - c^2*x^2)^2)/(4*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (b^2*d^4*(
1 - c^2*x^2)^(3/2)*ArcSin[c*x])/(4*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
 (8*b^2*d^4*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*
x)^(3/2)) - (b*c*d^4*x^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(2*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*d^4*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2
)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*d^4*x*(1 - c^2*x^2)*(a + b*A
rcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I)*d^4*(1 - c^2*
x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) +
 (4*d^4*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*
e*x)^(3/2)) + (d^4*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(2*(d + c*d*x)^
(3/2)*(e - c*e*x)^(3/2)) - (5*d^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^3
)/(2*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((32*I)*b*d^4*(1 - c^2*x^2)
^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*
(e - c*e*x)^(3/2)) + (16*b*d^4*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[
1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((16*
I)*b^2*d^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d +
c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((16*I)*b^2*d^4*(1 - c^2*x^2)^(3/2)*PolyL
og[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((8*I
)*b^2*d^4*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c
*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
```

```
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
```

```
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{3/2}\int \frac{(d+cdx)^4(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{(1-c^2x^2)^{3/2}\int \left(\frac{8(d^4+cd^4x)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}} - \frac{7d^4(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{4cd^4x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{c^2d^4x^2(a+b\arcsin(cx$$

$$= \frac{\left(8(1-c^2x^2)^{3/2}\right)\int \frac{(d^4+cd^4x)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(7d^4(1-c^2x^2)^{3/2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$- \frac{\left(4cd^4(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(c^2d^4(1-c^2x^2)^{3/2}\right)\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{4d^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{7d^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(8(1-c^2x^2)^{3/2}\right)\int\left(\frac{d^4(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}} + \frac{cd^4x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(d^4(1-c^2x^2)^{3/2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(8bd^4(1-c^2x^2)^{3/2}\right)\int(a+b\arcsin(cx))\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(bcd^4(1-c^2x^2)^{3/2}\right)\int x(a+b\arcsin(cx))\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bcd^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{5d^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(8d^4(1-c^2x^2)^{3/2}\right)\int\frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(8b^2d^4(1-c^2x^2)^{3/2}\right)\int\arcsin(cx)\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(8cd^4(1-c^2x^2)^{3/2}\right)\int\frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(b^2c^2d^4(1-c^2x^2)^{3/2}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}dx}{2(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bcd^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8d^4(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8d^4x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{5d^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(16bd^4(1-c^2x^2)^{3/2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(b^2d^4(1-c^2x^2)^{3/2}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(16bcd^4(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(8b^2cd^4(1-c^2x^2)^{3/2}\right)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2d^4(1-c^2x^2)^{3/2}\arcsin(cx)}{4c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bcd^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8d^4(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8d^4x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{5d^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(16bd^4(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(16bd^4(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$
\begin{aligned}
&= -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{b^2d^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2d^4(1-c^2x^2)^{3/2}\arcsin(cx)}{4c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{8b^2d^4x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bcd^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{8d^4(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8d^4x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{8id^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{d^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{5d^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{32ibd^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{\left(32ibd^4(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{\left(16b^2d^4(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{\left(16b^2d^4(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{b^2d^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2d^4(1-c^2x^2)^{3/2}\arcsin(cx)}{4c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{8b^2d^4x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bcd^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{8d^4(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8d^4x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{8id^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{d^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{5d^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{32ibd^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{16bd^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{\left(16ib^2d^4(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{\left(16ib^2d^4(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{\left(16b^2d^4(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

$$= -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{b^2d^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2d^4(1-c^2x^2)^{3/2}\arcsin(cx)}{4c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bcd^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8d^4(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8d^4x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8id^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{5d^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{32ibd^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{16bd^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{16ib^2d^4(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{16ib^2d^4(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(8ib^2d^4(1-c^2x^2)^{3/2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$
\begin{aligned}
&= -\frac{8abd^4x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8b^2d^4(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{b^2d^4x(1-c^2x^2)^2}{4(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{b^2d^4(1-c^2x^2)^{3/2}\arcsin(cx)}{4c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{8b^2d^4x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{bcd^4x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{2(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{8d^4(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8d^4x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{8id^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^4(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{d^4x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{2(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{5d^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{2bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{32ibd^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{16bd^4(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{16ib^2d^4(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{16ib^2d^4(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{8ib^2d^4(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 2041 vs. $2(918) = 1836$.

Time = 20.33 (sec) , antiderivative size = 2041, normalized size of antiderivative = 2.22

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \text{Result too large to show}$$

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((4*a^2*d^2)/e^2 + (a^2*c*d^2*x)/(
2*e^2) - (8*a^2*d^2)/(e^2*(-1 + c*x))))/c + (15*a^2*d^(5/2)*ArcTan[(c*x*Sqr
t[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*(1 + c*x)
)])/(2*c*e^(3/2)) - (a*b*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt
[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*((-4 + ArcSin[c*x])*ArcSin[c*x]
- 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) - (ArcSin[c*x]*(4 + ArcSi
```

n[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2
]))/(c*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x
]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (
4*a*b*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2
))]*(Cos[ArcSin[c*x]/2]*(-(c*x) + 2*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[
c*x] - ArcSin[c*x]^2 + 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + (c
*x + 2*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]^2 - 4*Log[
Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(c*e^2*Sqrt[
(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSi
n[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) - (b^2*d^2*(1 + c*x
)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-18*I)*Pi*Ar
cSin[c*x] - (6 - 6*I)*ArcSin[c*x]^2 + ArcSin[c*x]^3 - 24*Pi*Log[1 + E^((-I)
*ArcSin[c*x])] + 12*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 24*
Pi*Log[Cos[ArcSin[c*x]/2]] - 12*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (24*
I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (12*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2
])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])))/(3*c*e^2*Sqrt[(-d - c*d*x)*(
e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2)
- (b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^
2))]*((96*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - ((48 - 48*I)*ArcSin[c*x]^2)/
Sqrt[1 - c^2*x^2] + (20*ArcSin[c*x]^3)/Sqrt[1 - c^2*x^2] - 48*(-2 + ArcSin[
c*x]^2) - 6*c*x*(-1 + 2*ArcSin[c*x]^2) - (6*ArcSin[c*x]*Cos[2*ArcSin[c*x]])
/Sqrt[1 - c^2*x^2] + (48*((-3*I)*Pi*ArcSin[c*x] - 4*Pi*Log[1 + E^((-I)*ArcS
in[c*x])] + 2*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 4*Pi*Log[
Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLo
g[2, (-I)*E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (96*ArcSin[c*x]^2*Sin[Ar
cSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]))
))/(24*c*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] + Sin[ArcSi
n[c*x]/2])^2) - (2*b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-
(d*e*(1 - c^2*x^2))]*(6 + (6*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - 3*ArcSin[
c*x]^2 - ((6 - 6*I)*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] + (2*ArcSin[c*x]^3)/Sq
rt[1 - c^2*x^2] + (6*((-3*I)*Pi*ArcSin[c*x] - 4*Pi*Log[1 + E^((-I)*ArcSin[c
x])] + 2(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[
ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2,
 (-I)*E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (12*ArcSin[c*x]^2*Sin[ArcSin
[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]))))/(
3*c*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x
]/2])^2) + (a*b*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1
 - c^2*x^2))]*((-15 + 14*ArcSin[c*x])*Cos[(3*ArcSin[c*x])/2] + Cos[(5*ArcSi
n[c*x])/2] + 2*ArcSin[c*x]*Cos[(5*ArcSin[c*x])/2] + Cos[ArcSin[c*x]/2]*(16
+ 48*ArcSin[c*x] - 20*ArcSin[c*x]^2 + 64*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSi
n[c*x]/2]]) - 16*Sin[ArcSin[c*x]/2] + 48*ArcSin[c*x]*Sin[ArcSin[c*x]/2] + 2
0*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2] - 64*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin
[c*x]/2]]*Sin[ArcSin[c*x]/2] - 15*Sin[(3*ArcSin[c*x])/2] - 14*ArcSin[c*x]*S
in[(3*ArcSin[c*x])/2] - Sin[(5*ArcSin[c*x])/2] + 2*ArcSin[c*x]*Sin[(5*ArcSi
n[c*x])/2]))/(8*c*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos

```
[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]
/2])^2)
```

Maple [F]

$$\int \frac{(cdx+d)^{\frac{5}{2}} (a+b\arcsin(cx))^2}{(-cex+e)^{\frac{3}{2}}} dx$$

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
```

Fricas [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
[Out] integral((a^2*c^2*d^2*x^2 + 2*a^2*c*d^2*x + a^2*d^2 + (b^2*c^2*d^2*x^2 + 2*
b^2*c*d^2*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x +
 a*b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^2*e^2*x^2 - 2*c*
e^2*x + e^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(3/2),x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{5/2}}{(e-c\,e\,x)^{3/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(5/2))/(e - c*e*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(5/2))/(e - c*e*x)^(3/2), x)
```

3.565 $\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 713

$$\begin{aligned}
\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx &= -\frac{2abd^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{2b^2d^3(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{4d^3(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{4id^3(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{d^3(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^3(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{16ibd^3(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{8bd^3(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{8ib^2d^3(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{8ib^2d^3(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&- \frac{4ib^2d^3(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}$$

```
[Out] -2*a*b*d^3*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-2*b^2*d^3*
(-c^2*x^2+1)^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-2*b^2*d^3*x*(-c^2*x^2+1)^
```

```
(3/2)*arcsin(c*x)/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*d^3*(-c^2*x^2+1)*(a+b*
arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*d^3*x*(-c^2*x^2+1)*(a+b
*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*I*d^3*(-c^2*x^2+1)^(3/2)
*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+d^3*(-c^2*x^2+1)^2*
(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-d^3*(-c^2*x^2+1)^(3/
2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+16*I*b*d^3*(-c^
2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+
d)^(3/2)/(-c*e*x+e)^(3/2)+8*b*d^3*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*ln(1
+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-8*I*b^2*d
^3*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^
(3/2)/(-c*e*x+e)^(3/2)+8*I*b^2*d^3*(-c^2*x^2+1)^(3/2)*polylog(2,I*(I*c*x+(-
c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*I*b^2*d^3*(-c^2*x^2
+1)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*
x+e)^(3/2)
```

Rubi [A] (verified)

Time = 0.70 (sec) , antiderivative size = 713, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.469$, Rules used = {4763, 4859, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266, 4737, 4715, 267}

$$\begin{aligned}
\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx &= \frac{16ibd^3(1-c^2x^2)^{3/2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
&- \frac{d^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
&- \frac{4id^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{4d^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{4d^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{8bd^3(1-c^2x^2)^{3/2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
&- \frac{2abd^3x(1-c^2x^2)^{3/2}}{(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{8ib^2d^3(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
&+ \frac{8ib^2d^3(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{4ib^2d^3(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}} \\
&- \frac{2b^2d^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3(1-c^2x^2)^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}}
\end{aligned}$$

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```

```
[Out] (-2*a*b*d^3*x*(1 - c^2*x^2)^(3/2))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) -
(2*b^2*d^3*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (2*b^
2*d^3*x*(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/
```

```
2)) + (4*d^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2)) + (4*d^3*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)
^(3/2)*(e - c*e*x)^(3/2)) - ((4*I)*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*
x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (d^3*(1 - c^2*x^2)^2*(a +
b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (d^3*(1 - c^2*x
^2)^(3/2)*(a + b*ArcSin[c*x])^3)/(b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
+ ((16*I)*b*d^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[
c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (8*b*d^3*(1 - c^2*x^2)^(3
/2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2
)*(e - c*e*x)^(3/2)) - ((8*I)*b^2*d^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E
^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((8*I)*b^2*d^3
*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*
(e - c*e*x)^(3/2)) - ((4*I)*b^2*d^3*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I
)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
```

```
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(1-c^2x^2)^{3/2}\int \frac{(d+cdx)^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}\\
&= \frac{(1-c^2x^2)^{3/2}\int \left(\frac{4(d^3+cd^3x)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}-\frac{3d^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{cd^3x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}\\
&= \frac{\left(4(1-c^2x^2)^{3/2}\right)\int \frac{(d^3+cd^3x)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}\\
&\quad-\frac{\left(3d^3(1-c^2x^2)^{3/2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{\left(cd^3(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}$$

$$= \frac{d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(4(1-c^2x^2)^{3/2}\right)\int\left(\frac{d^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}} + \frac{cd^3x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2bd^3(1-c^2x^2)^{3/2}\right)\int(a+b\arcsin(cx))\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2abd^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(4d^3(1-c^2x^2)^{3/2}\right)\int\frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2b^2d^3(1-c^2x^2)^{3/2}\right)\int\arcsin(cx)\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(4cd^3(1-c^2x^2)^{3/2}\right)\int\frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2abd^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(8bd^3(1-c^2x^2)^{3/2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(8bcd^3(1-c^2x^2)^{3/2}\right)\int\frac{x(a+b\arcsin(cx))}{1-c^2x^2}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2b^2cd^3(1-c^2x^2)^{3/2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2abd^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(8bd^3(1-c^2x^2)^{3/2}\right)\text{Subst}(\int(a+bx)\sec(x)\,dx, x, \arcsin(cx))}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(8bd^3(1-c^2x^2)^{3/2}\right)\text{Subst}(\int(a+bx)\tan(x)\,dx, x, \arcsin(cx))}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2abd^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4id^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{16ibd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(16ibd^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(8b^2d^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(8b^2d^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2abd^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4id^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{16ibd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(8ib^2d^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(8ib^2d^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(8b^2d^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2abd^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4id^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{16ibd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8ib^2d^3(1-c^2x^2)^{3/2}\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8ib^2d^3(1-c^2x^2)^{3/2}\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(4ib^2d^3(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{2abd^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3(1-c^2x^2)^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2b^2d^3x(1-c^2x^2)^{3/2}\arcsin(cx)}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4d^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4id^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{d^3(1-c^2x^2)^2(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{16ibd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8bd^3(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{8ib^2d^3(1-c^2x^2)^{3/2}\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8ib^2d^3(1-c^2x^2)^{3/2}\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4ib^2d^3(1-c^2x^2)^{3/2}\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

Mathematica [A] (verified)

Time = 15.84 (sec) , antiderivative size = 1255, normalized size of antiderivative = 1.76

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \frac{\sqrt{-e(-1+cx)}\sqrt{d(1+cx)}\left(\frac{a^2d}{e^2}-\frac{4a^2d}{e^2(-1+cx)}\right)}{c}$$

$$+\frac{3a^2d^{3/2}\arctan\left(\frac{cx\sqrt{-e(-1+cx)}\sqrt{d(1+cx)}}{\sqrt{d}\sqrt{e}(-1+cx)(1+cx)}\right)}{ce^{3/2}}$$

$$-\frac{abd(1+cx)\sqrt{d+cdx}\sqrt{e-cex}\sqrt{-de\left(1-c^2x^2\right)}\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)\left((-4+\arcsin(cx))\arcsin(cx)-8\log\right.\right.}{ce^2\sqrt{(-d-cdx)(e-cex)}\sqrt{1-c^2x^2}\left(\cos\right.}$$

$$+\frac{2abd(1+cx)\sqrt{d+cdx}\sqrt{e-cex}\sqrt{-de\left(1-c^2x^2\right)}\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)\left(-cx+2\arcsin(cx)+\sqrt{1-c^2x^2}\,\mathrm{arcs}\right.\right.}{ce^2\sqrt{(-d-c}}$$

$$-\frac{b^2d(1+cx)\sqrt{d+cdx}\sqrt{e-cex}\sqrt{-de\left(1-c^2x^2\right)}\left(-18i\pi\arcsin(cx)-(6-6i)\arcsin(cx)^2+\arcsin(cx)^3-\right.}{}$$

$$-\frac{b^2d(1+cx)\sqrt{d+cdx}\sqrt{e-cex}\sqrt{-de\left(1-c^2x^2\right)}\left(6+\frac{6cx\arcsin(cx)}{\sqrt{1-c^2x^2}}-3\arcsin(cx)^2-\frac{(6-6i)\arcsin(cx)^2}{\sqrt{1-c^2x^2}}+\frac{2\,\mathrm{arcsin}}{\sqrt{1-c}}\right.}{}$$

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]

[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((a^2*d)/e^2 - (4*a^2*d)/(e^2*(-1
+ c*x))))/c + (3*a^2*d^(3/2)*ArcTan[(c*x*Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 +
c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*(1 + c*x))])/(c*e^(3/2)) - (a*b*d*(1 + c
*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[
c*x]/2]*((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]]) - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2]
- Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(c*e^2*Sqrt[(-d - c*d*x)*(e - c
*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[Arc
Sin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (2*a*b*d*(1 + c*x)*Sqrt[d + c*d*x]*S
qrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(-(c*x) + 2*A
rcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x] - ArcSin[c*x]^2 + 4*Log[Cos[ArcS
in[c*x]/2] - Sin[ArcSin[c*x]/2]]) + (c*x + 2*ArcSin[c*x] - Sqrt[1 - c^2*x^2
]*ArcSin[c*x] + ArcSin[c*x]^2 - 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/
2]])*Sin[ArcSin[c*x]/2]))/(c*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^
2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[
ArcSin[c*x]/2])^2) - (b^2*d*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[
-(d*e*(1 - c^2*x^2))]*((-18*I)*Pi*ArcSin[c*x] - (6 - 6*I)*ArcSin[c*x]^2 + A
rcSin[c*x]^3 - 24*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 12*(Pi - 2*ArcSin[c*x]
)*Log[1 + I*E^(I*ArcSin[c*x])] + 24*Pi*Log[Cos[ArcSin[c*x]/2]] - 12*Pi*Log[
-Cos[(Pi + 2*ArcSin[c*x])/4]] + (24*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] -
 (12*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x
]/2])))/(3*c*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcS
```

```
in[c*x]/2] + Sin[ArcSin[c*x]/2])^2) - (b^2*d*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(6 + (6*c*x*ArcSin[c*x])/Sqrt[1 - c^
2*x^2] - 3*ArcSin[c*x]^2 - ((6 - 6*I)*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] + (2
*ArcSin[c*x]^3)/Sqrt[1 - c^2*x^2] + (6*((-3*I)*Pi*ArcSin[c*x] - 4*Pi*Log[1
+ E^((-I)*ArcSin[c*x])] + 2*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x]
)] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]
+ (4*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] - (12*ArcSin
[c*x]^2*Sin[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]))))/(3*c*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2
] + Sin[ArcSin[c*x]/2])^2)
```

Maple [F]

$$\int \frac{(cdx+d)^{\frac{3}{2}} (a+b\arcsin(cx))^2}{(-cex+e)^{\frac{3}{2}}}dx$$

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
```

Fricas [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
[Out] integral((a^2*c*d*x + a^2*d + (b^2*c*d*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*c*
d*x + a*b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^2*e^2*x^2 - 2
*c*e^2*x + e^2), x)
```

Sympy [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \int \frac{(d(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))^2}{(-e(cx-1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(3/2),x)
[Out] Integral((d*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/(-e*(c*x - 1))**(3/2), x
)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}}{(e-c\,e\,x)^{3/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2))/(e - c*e*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2))/(e - c*e*x)^(3/2), x)
```

3.566 $\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 530

$$\begin{aligned}\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx &= \frac{2d^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{2d^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2id^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{d^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{8ibd^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{4bd^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{4ib^2d^2(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{4ib^2d^2(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{2ib^2d^2(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}\end{aligned}$$

```
[Out] 2*d^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2
*d^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-2*
I*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(
3/2)-1/3*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(3/2)/(-c
*e*x+e)^(3/2)+8*I*b*d^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(
-c^2*x^2+1)^(1/2))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*b*d^2*(-c^2*x^2+1)^
```

```
(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2
)/(-c*e*x+e)^(3/2)-4*I*b^2*d^2*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c^2
*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*I*b^2*d^2*(-c^2*x^2+1)
^(3/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)
^(3/2)-2*I*b^2*d^2*(-c^2*x^2+1)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))
^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)
```

Rubi [A] (verified)

Time = 0.62 (sec) , antiderivative size = 530, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.406$, Rules used = {4763, 4859, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266, 4737}

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \frac{8ibd^2(1-c^2x^2)^{3/2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{d^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{3bc(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{2id^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{4bd^2(1-c^2x^2)^{3/2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{4ib^2d^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{4ib^2d^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{2ib^2d^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}$$

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```

```
[Out] (2*d^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x
)^(3/2)) + (2*d^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)
*(e - c*e*x)^(3/2)) - ((2*I)*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (d^2*(1 - c^2*x^2)^(3/2)*(a + b*
ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((8*I)*b*d^2*
(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d +
c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (4*b*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
n[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3
/2)) - ((4*I)*b^2*d^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])
])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + ((4*I)*b^2*d^2*(1 - c^2*x^2)^(
3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - ((2*I)*b^2*d^2*(1 - c^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])
/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(1-c^2x^2\right)^{3/2}\int \frac{(d+cdx)^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(1-c^2x^2\right)^{3/2}\int \left(\frac{2(d^2+cd^2x)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}-\frac{d^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{(d^2+cd^2x)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(d^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{d^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2\left(1-c^2x^2\right)^{3/2}\right)\int \left(\frac{d^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}+\frac{cd^2x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= -\frac{d^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2d^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2cd^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(4bd^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(4bcd^2\left(1-c^2x^2\right)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(4bd^2\left(1-c^2x^2\right)^{3/2}\right)\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(4bd^2\left(1-c^2x^2\right)^{3/2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$=\frac{2d^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{2d^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{2id^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{d^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{8ibd^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{\left(8ibd^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{\left(4b^2d^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{\left(4b^2d^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$=\frac{2d^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{2d^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{2id^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{d^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{8ibd^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{4bd^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{\left(4ib^2d^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$+\frac{\left(4ib^2d^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$
$$-\frac{\left(4b^2d^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2id^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8ibd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4ib^2d^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4ib^2d^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2ib^2d^2(1-c^2x^2)^{3/2}\right)\operatorname{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2id^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{d^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{8ibd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{4ib^2d^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4ib^2d^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2ib^2d^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

Mathematica [A] (verified)

Time = 6.73 (sec) , antiderivative size = 513, normalized size of antiderivative = 0.97

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx =$$

$$-\frac{\frac{6a^2\sqrt{d+cdx}\sqrt{e-cex}}{-1+cx}-3a^2\sqrt{d}\sqrt{e}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right)+\frac{3ab(1+cx)\sqrt{d+cdx}\sqrt{e-cex}(\cos(\frac{1}{2}\arcsin(cx))((-4+\arcsin(cx))\arcs}{\sqrt{1-}}}{}$$

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(3/2),x]
```

```
[Out] -1/3*((6*a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(-1 + c*x) - 3*a^2*Sqrt[d]*Sq
rt[e]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c
^2*x^2))] + (3*a*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(Cos[ArcSin[c*
x]/2]*((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] - Sin[ArcS
in[c*x]/2]]) - (ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] -
Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) +
(b^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((-18*I)*Pi*ArcSin[c*x] - (6
 - 6*I)*ArcSin[c*x]^2 + ArcSin[c*x]^3 - 24*Pi*Log[1 + E^((-I)*ArcSin[c*x])]
 + 12*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 24*Pi*Log[Cos[Arc
Sin[c*x]/2]] - 12*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (24*I)*PolyLog[2,
(-I)*E^(I*ArcSin[c*x])] - (12*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin
[c*x]/2] - Sin[ArcSin[c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + S
in[ArcSin[c*x]/2])^2))/(c*e^2)
```

Maple [F]

$$\int \frac{\sqrt{cdx+d}\,(a+b\arcsin(cx))^2}{(-cex+e)^{\frac{3}{2}}}dx$$

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x)
```

Fricas [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \int \frac{\sqrt{cdx+d}(b\arcsin(cx)+a)^2}{(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^2*e^2*x^2 - 2*c*e^2*x + e^2), x)
```

Sympy [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \int \frac{\sqrt{d(cx+1)}(a+b\operatorname{asin}(cx))^2}{(-e(cx-1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(3/2),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))**2/(-e*(c*x - 1))**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \int \frac{\sqrt{cdx+d}(b\arcsin(cx)+a)^2}{(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}}{(e-c\,e\,x)^{3/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2))/(e - c*e*x)^(3/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2))/(e - c*e*x)^(3/2), x)
```

3.567 $\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 454

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx &= \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{dx(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{id(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{4ibd(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{2bd(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{2ib^2d(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{2ib^2d(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{ib^2d(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}\end{aligned}$$

```
[Out] d*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+d*x*(
-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*d*(-c^2*
x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*I*b*d
*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c
*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*b*d*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*l
n(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-2*I*b^
2*d*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)
^(3/2)/(-c*e*x+e)^(3/2)+2*I*b^2*d*(-c^2*x^2+1)^(3/2)*polylog(2,I*(I*c*x+(-c
^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*b^2*d*(-c^2*x^2+1)^(
```

```
3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^
(3/2)
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 454, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {4763, 4847, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 4749, 4266}

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx = \frac{4ibd(1-c^2x^2)^{3/2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{id(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{2bd(1-c^2x^2)^{3/2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{2ib^2d(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{2ib^2d(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{ib^2d(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)),x]
```

```
[Out] (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3
/2)) + (d*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*
e*x)^(3/2)) - (I*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x
)^(3/2)*(e - c*e*x)^(3/2)) + ((4*I)*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c
*x])*ArcTan[E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) + (
2*b*d*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])
])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - ((2*I)*b^2*d*(1 - c^2*x^2)^(3/
2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/
2)) + ((2*I)*b^2*d*(1 - c^2*x^2)^(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*
(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*d*(1 - c^2*x^2)^(3/2)*PolyLog
[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{3/2}\int\frac{(d+cdx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{(1-c^2x^2)^{3/2}\int\left(\frac{d(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}+\frac{cdx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{\left(d(1-c^2x^2)^{3/2}\right)\int\frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{\left(cd(1-c^2x^2)^{3/2}\right)\int\frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2bd(1-c^2x^2)^{3/2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{\left(2bcd(1-c^2x^2)^{3/2}\right)\int\frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2bd(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2bd(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{id(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4ibd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(4ibd(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2b^2d(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2b^2d(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{id(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4ibd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2ib^2d(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(2ib^2d(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2b^2d(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{id(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4ibd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2ib^2d(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2ib^2d(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(ib^2d(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{id(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{4ibd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{2ib^2d(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2ib^2d(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{ib^2d(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

Mathematica [A] (verified)

Time = 3.25 (sec) , antiderivative size = 221, normalized size of antiderivative = 0.49

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx = -\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(a\left(a+acx+4b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\right)\right)-4ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2\right.\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)),x]
```

```
[Out] -((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a*(a + a*c*x + 4*b*Sqrt[1 - c^2*x^2]*Lo
g[Cos[(Pi + 2*ArcSin[c*x])/4]]) - (4*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-
I)*E^(I*ArcSin[c*x])] + b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2*(-I + Tan[(Pi +
 2*ArcSin[c*x])/4]) + 2*b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(2*b*Log[1 + I*E^(I
*ArcSin[c*x])] + a*Tan[(Pi + 2*ArcSin[c*x])/4])))/(c*d*e^2*(-1 + c*x)*(1 +
c*x)))
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\,(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^3*d*e^2*x^3 - c^2*d*e^2*x^2 - c*d*e^2*x + d*e^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{\sqrt{d(cx+1)}\,(-e(cx-1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(3/2),x)
[Out] Integral((a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*(-e*(c*x - 1))**(3/2)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x, algorithm
="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*(-c*e*x + e)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d+c\,d\,x}\,(e-c\,e\,x)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(3/2)),x)
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(3/2)), x)
```

3.568 $\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 217

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{x(1-c^2x^2)(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b(1-c^2x^2)^{3/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{ib^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

```
[Out] x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*(-c^2
*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*b*(-
c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*
d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*b^2*(-c^2*x^2+1)^(3/2)*polylog(2,-(I*c*x+(-
c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)
```

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.219$, Rules used

$= \{4763, 4745, 4765, 3800, 2221, 2317, 2438\}$

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = -\frac{i(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{x(1-c^2x^2)(a+b\arcsin(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{2b(1-c^2x^2)^{3/2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{ib^2(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - (I*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e
- c*e*x)^(3/2)) + (2*b*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((
2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*(1 - c
^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(1-c^2x^2)^{3/2}\int\frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}\\
&= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{\left(2bc(1-c^2x^2)^{3/2}\right)\int\frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}}\\
&= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{\left(2b(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}\\
&= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{i(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}\\
&\quad+\frac{\left(4ib(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}\\
&= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{i(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}\\
&\quad+\frac{2b(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}\\
&\quad-\frac{\left(2b^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}$$

$$= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(ib^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{ib^2(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 550 vs. 2(217) = 434.

Time = 4.47 (sec) , antiderivative size = 550, normalized size of antiderivative = 2.53

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{a^2cx+2abcx\arcsin(cx)+2ib^2\pi\sqrt{1-c^2x^2}\arcsin(cx)+b^2cx\arcsin(cx)^2-i}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (a^2*c*x + 2*a*b*c*x*ArcSin[c*x] + (2*I)*b^2*Pi*Sqrt[1 - c^2*x^2]*ArcSin[c*
x] + b^2*c*x*ArcSin[c*x]^2 - I*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 + 4*b^2*
Pi*Sqrt[1 - c^2*x^2]*Log[1 + E^((-I)*ArcSin[c*x])] + b^2*Pi*Sqrt[1 - c^2*x^
2]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1
 - I*E^(I*ArcSin[c*x])] - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[1 + I*E^(I*ArcSin[c*
x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - 4
*b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2]] + b^2*Pi*Sqrt[1 - c^2*x^2
]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSi
n[c*x]/2] - Sin[ArcSin[c*x]/2]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]] - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcS
in[c*x])/4]] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d*e*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x])
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^4*d^2*e^2*x^4 - 2*c^2*d^2*e^2*x^2 + d^2*e^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{(d(cx+1))^{\frac{3}{2}}(-e(cx-1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
[Out] Integral((a + b*asin(c*x))**2/((d*(c*x + 1))**(3/2)*(-e*(c*x - 1))**(3/2)),
 x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
[Out] -b^2*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^2*d*e*x^2 -
 d*e)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/(sqrt(d)*sqrt(e)) + 2*a*b*x*arcsin(
c*x)/(sqrt(-c^2*d*e*x^2 + d*e)*d*e) + a^2*x/(sqrt(-c^2*d*e*x^2 + d*e)*d*e)
- a*b*sqrt(1/(d*e))*log(x^2 - 1/c^2)/(c*d*e)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x)
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)), x)
```

3.569 $\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 709

$$\begin{aligned}
\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx &= -\frac{b^2e(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{b^2ex(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{bex(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2ex(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{2ie(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{2ibe(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{4be(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{ib^2e(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{ib^2e(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{2ib^2e(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}$$

```
[Out] -1/3*b^2*e*(-c^2*x^2+1)^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*b^2*e*x*(-
c^2*x^2+1)^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*e*(-c^2*x^2+1)^(3/2)*(a
```

```
+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*b*e*x*(-c^2*x^2+1)^(
3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*e*(-c^2*x^2+1)*
(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*e*x*(-c^2*x^2+1)
*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*e*x*(-c^2*x^2+1)^
2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*e*(-c^2*x^2+1)
^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*b*e*(-c
^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x
+d)^(5/2)/(-c*e*x+e)^(5/2)+4/3*b*e*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(
1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*I*b^
2*e*(-c^2*x^2+1)^(5/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)
^(5/2)/(-c*e*x+e)^(5/2)-1/3*I*b^2*e*(-c^2*x^2+1)^(5/2)*polylog(2,I*(I*c*x+(
-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*b^2*e*(-c^2*x^
2+1)^(5/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e
*x+e)^(5/2)
```

Rubi [A] (verified)

Time = 0.61 (sec) , antiderivative size = 709, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.438$, Rules used = {4763, 4847, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 4749, 4266, 267}

$$\begin{aligned}
&\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \\
&-\frac{2ibe(1-c^2x^2)^{5/2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&-\frac{2ie(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{2ex(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&-\frac{be(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{bex(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&-\frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&+\frac{4be(1-c^2x^2)^{5/2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&+\frac{ib^2e(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&-\frac{ib^2e(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&-\frac{2ib^2e(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} \\
&-\frac{b^2e(1-c^2x^2)^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}+\frac{b^2ex(1-c^2x^2)^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}}
\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] -1/3*(b^2*e*(1 - c^2*x^2)^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (b^2
*e*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*e*(1 - c
^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)
) + (b*e*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e
 - c*e*x)^(5/2)) - (e*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)
^(5/2)*(e - c*e*x)^(5/2)) + (e*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d
 + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*e*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c
*x])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((2*I)/3)*e*(1 - c^2*x^2
)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - ((
(2*I)/3)*b*e*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x
])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*b*e*(1 - c^2*x^2)^(5/2)*(
a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(
e - c*e*x)^(5/2)) + ((I/3)*b^2*e*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I*A
rcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - ((I/3)*b^2*e*(1 - c
^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*
e*x)^(5/2)) - (((2*I)/3)*b^2*e*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I)*Arc
Sin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
```

```
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int \frac{(e-cex)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{(1-c^2x^2)^{5/2}\int \left(\frac{e(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}} - \frac{cex(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(e(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(ce(1-c^2x^2)^{5/2}\right)\int \frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2e(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2be(1-c^2x^2)^{5/2}\right)\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2bce(1-c^2x^2)^{5/2}\right)\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=-\frac{be(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{bex(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2ex(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(be(1-c^2x^2)^{5/2}\right)\int\frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(b^2e(1-c^2x^2)^{5/2}\right)\int\frac{1}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{\left(4bce(1-c^2x^2)^{5/2}\right)\int\frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{\left(b^2ce(1-c^2x^2)^{5/2}\right)\int\frac{x}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=-\frac{b^2e(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{b^2ex(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{be(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{bex(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2ex(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(be(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{\left(4be(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{b^2e(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2ex(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{bex(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2ex(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2ie(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2ibe(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(8ibe(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(b^2e(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(b^2e(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{b^2e(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2ex(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{bex(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2ex(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2ie(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2ibe(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4be(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(ib^2e(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(ib^2e(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{\log(1+ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(4b^2e(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{b^2e(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2ex(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{bex(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2ex(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2ie(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2ibe(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4be(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{ib^2e(1-c^2x^2)^{5/2}\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{ib^2e(1-c^2x^2)^{5/2}\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2ib^2e(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{b^2e(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2ex(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{be(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{bex(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{e(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{ex(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2ex(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2ie(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2ibe(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4be(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{ib^2e(1-c^2x^2)^{5/2}\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{ib^2e(1-c^2x^2)^{5/2}\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2ib^2e(1-c^2x^2)^{5/2}\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

Mathematica [A] (warning: unable to verify)

Time = 10.31 (sec) , antiderivative size = 739, normalized size of antiderivative = 1.04

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \frac{\sqrt{-e(-1+cx)}\sqrt{d(1+cx)}\left(-\frac{a^2}{4d^3e^2(-1+cx)}-\frac{a^2}{6d^3e^2(1+cx)^2}-\frac{5a^2}{12d^3e^2(1+cx)}\right)}{c} + \frac{ab\sqrt{d+cdx}\sqrt{e-cex}\left(2\arcsin(cx)(-2cx+\cos(2\arcsin(cx)))-\sqrt{1-c^2x^2}\left(-1+3\log\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)\right)\right.\right.}{3cd^2e\sqrt{(-}} + \frac{b^2\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}\left(-7i\pi\arcsin(cx)+(1+4i)\arcsin(cx)^2-16\pi\log\left(1+e^{-i\arcsin(cx)}\right)-5(\pi\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*(-1/4*a^2/(d^3*e^2*(-1 + c*x)) - a
^2/(6*d^3*e^2*(1 + c*x)^2) - (5*a^2)/(12*d^3*e^2*(1 + c*x))))/c + (a*b*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]*(2*ArcSin[c*x]*(-2*c*x + Cos[2*ArcSin[c*x]]) -
Sqrt[1 - c^2*x^2]*(-1 + 3*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 5*
Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + c*x*(3*Log[Cos[ArcSin[c*x]/2
] - Sin[ArcSin[c*x]/2]] + 5*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])))
)/(3*c*d^2*e*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos
[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x]*Sqrt[1 - c^2*x^2]*((-7*I)*Pi*ArcSin[c*x] + (1 + 4*I)*ArcSin[c*x]^2 - 1
6*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 5*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*
ArcSin[c*x])] + 3*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 16*Pi
*Log[Cos[ArcSin[c*x]/2]] - 3*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 5*Pi*Lo
g[Sin[(Pi + 2*ArcSin[c*x])/4]] + (6*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] +
 (10*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] - (3*ArcSin[c*x]^2*Sin[ArcSin[c*x]/
2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (2*ArcSin[c*x]^2*Sin[ArcSin
[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (ArcSin[c*x]*(2 + A
rcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 - ((4 + 5*ArcSin[c
*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(6*c
*d^2*e*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[-(d*e*(1 - c^2*x^2))])
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^5*d^3*e^2*x^5 + c^4*d^3*e^2*x^4 - 2*c^3*d^3*e^2*x^3 - 2*c^2
*d^3*e^2*x^2 + c*d^3*e^2*x + d^3*e^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(5/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x, algorithm
="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(5/2)*(-c*e*x + e)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{5/2}\,(e-c\,e\,x)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)),x)
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)), x)
```

3.570 $\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 730

$$
\begin{aligned}
\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx &= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{2b^2d^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{28id^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{d^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{112bd^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{112ib^2d^5(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{8bd^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{16b^2d^5(1-c^2x^2)^{5/2}\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{28d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{4d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

```
[Out] 2*a*b*d^5*x*(-c^2*x^2+1)^(5/2)/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2*b^2*d^5*(
-c^2*x^2+1)^3/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2*b^2*d^5*x*(-c^2*x^2+1)^(
5/2)*arcsin(c*x)/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-28/3*I*d^5*(-c^2*x^2+1)^(
5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-d^5*(-c^2*x^2+1
```

```
)^3*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+5/3*d^5*(-c^2*x^
2+1)^(5/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-112/3*b
*d^5*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1-I/(I*c*x+(-c^2*x^2+1)^(1/2))
)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-112/3*I*b^2*d^5*(-c^2*x^2+1)^(5/2)*pol
ylog(2,I/(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-8/3
*b*d^5*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*sec(1/4*Pi+1/2*arcsin(c*x))^2/c
/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+16/3*b^2*d^5*(-c^2*x^2+1)^(5/2)*tan(1/4*P
i+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-28/3*d^5*(-c^2*x^2+1)
^(5/2)*(a+b*arcsin(c*x))^2*tan(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-
c*e*x+e)^(5/2)+4/3*d^5*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*sec(1/4*Pi+1/
2*arcsin(c*x))^2*tan(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(
5/2)
```

Rubi [A] (verified)

Time = 0.86 (sec) , antiderivative size = 730, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {4763, 4859, 4737, 4767, 4715, 267, 4857, 3399, 4271, 3852, 8, 4269, 3798, 2221, 2317, 2438}

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \frac{5d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{d^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{28id^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{112bd^5(1-c^2x^2)^{5/2}\log\left(1-ie^{-i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{28d^5(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{8bd^5(1-c^2x^2)^{5/2}\sec^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{4d^5(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\sec^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{2abd^5x(1-c^2x^2)^{5/2}}{(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{112ib^2d^5(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{16b^2d^5(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5(1-c^2x^2)^3}{c(cdx+d)^{5/2}(e-cex)^{5/2}}$$

```
[In] Int[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

```
[Out] (2*a*b*d^5*x*(1 - c^2*x^2)^(5/2))/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (
2*b^2*d^5*(1 - c^2*x^2)^3)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*b^2
*d^5*x*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2
)) - (((28*I)/3)*d^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d
*x)^(5/2)*(e - c*e*x)^(5/2)) - (d^5*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x])^2)/
(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (5*d^5*(1 - c^2*x^2)^(5/2)*(a + b
*ArcSin[c*x])^3)/(3*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (112*b*d^5*(
1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Log[1 - I/E^(I*ArcSin[c*x])])/(3*c*(
d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((112*I)/3)*b^2*d^5*(1 - c^2*x^2)^(5
/2)*PolyLog[2, I/E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)
) - (8*b*d^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]
/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (16*b^2*d^5*(1 - c^2*x^2
)^(5/2)*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)
) - (28*d^5*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x
]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*d^5*(1 - c^2*x^2)^(5/2
)*(a + b*ArcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[c*x]/
2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4271

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> Simp[(-b^2)*(c + d*x)^m*Cot[e + f*x]*((b*Csc[e + f*x])^(n - 2)/(f*(n
- 1))), x] + (Dist[b^2*d^2*m*((m - 1)/(f^2*(n - 1)*(n - 2))), Int[(c + d*x)
^(m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[b^2*((n - 2)/(n - 1)), Int
[(c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[b^2*d*m*(c + d*x)^(m -
 1)*((b*Csc[e + f*x])^(n - 2)/(f^2*(n - 1)*(n - 2))), x]) /; FreeQ[{b, c, d
, e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int\frac{(d+cdx)^5(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{(1-c^2x^2)^{5/2}\int\left(\frac{5d^5(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{cd^5x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{8d^5(a+b\arcsin(cx))^2}{(-1+cx)^2\sqrt{1-c^2x^2}}+\frac{12d^5(a+b\arcsin(cx))^2}{(-1+cx)\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(5d^5(1-c^2x^2)^{5/2}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(8d^5(1-c^2x^2)^{5/2}\right)\int\frac{(a+b\arcsin(cx))^2}{(-1+cx)^2\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(12d^5(1-c^2x^2)^{5/2}\right)\int\frac{(a+b\arcsin(cx))^2}{(-1+cx)\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(cd^5(1-c^2x^2)^{5/2}\right)\int\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{d^5(1-c^2x^2)^3\,(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5d^5(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(12d^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{(a+bx)^2}{-c+c\sin(x)}\,dx,x,\arcsin(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2bd^5(1-c^2x^2)^{5/2}\right)\int(a+b\arcsin(cx))\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(8cd^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{(a+bx)^2}{(-c+c\sin(x))^2}\,dx,x,\arcsin(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{d^5(1-c^2x^2)^3\,(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5d^5(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2b^2d^5(1-c^2x^2)^{5/2}\right)\int\arcsin(cx)\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2d^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)^2\csc^4\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(6d^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)^2\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{d^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{8bd^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{12d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{4d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(4d^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)^2\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(24bd^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)\cot\left(\frac{\pi}{4}-\frac{x}{2}\right)dx, x, \arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(8b^2d^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(2b^2cd^5(1-c^2x^2)^{5/2}\right)\int\frac{x}{\sqrt{1-c^2x^2}}dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{2b^2d^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{12id^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{d^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{8bd^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{28d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{4d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(16bd^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)\cot\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(48bd^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{e^{-ix}(a+bx)}{1-ie^{-ix}}\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(16b^2d^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int 1\,dx,x,\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{2b^2d^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{28id^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{d^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{16b^2d^5(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{48bd^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{8bd^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{28d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{4d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(32bd^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{e^{-ix}(a+bx)}{1-ie^{-ix}}\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(48b^2d^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\log\left(1-ie^{-ix}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{2b^2d^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{28id^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{d^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{16b^2d^5(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{112bd^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{8bd^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{28d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{4d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(48ib^2d^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx, x, e^{-i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(32b^2d^5(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\log\left(1-ie^{-ix}\right)\,dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$
\begin{aligned}
&= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{2b^2d^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{28id^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{d^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{16b^2d^5(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{112bd^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{48ib^2d^5(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{8bd^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{28d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{4d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{\left(32ib^2d^5(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2abd^5x(1-c^2x^2)^{5/2}}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^5(1-c^2x^2)^3}{c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{2b^2d^5x(1-c^2x^2)^{5/2}\arcsin(cx)}{(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{28id^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{d^5(1-c^2x^2)^3(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{5d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{16b^2d^5(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{112bd^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{112ib^2d^5(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{8bd^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{28d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{4d^5(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 2312 vs. $2(730) = 1460$.

Time = 21.10 (sec) , antiderivative size = 2312, normalized size of antiderivative = 3.17

$$
\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \text{Result too large to show}
$$

```
[In] Integrate[((d + c*d*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*(-((a^2*d^2)/e^3) + (8*a^2*d^2)/(3
*e^3*(-1 + c*x)^2) + (28*a^2*d^2)/(3*e^3*(-1 + c*x))))/c - (5*a^2*d^(5/2)*A
rcTan[(c*x*Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 +
c*x)*(1 + c*x))]])/(c*e^(5/2)) + (a*b*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sq
rt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Co
s[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) - Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*
x] - 2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(2 + 2*ArcSin[c*x]
 + Sqrt[1 - c^2*x^2]*ArcSin[c*x] + 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2]] + 2*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*
Sin[ArcSin[c*x]/2]))/(3*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) +
```

(a*b*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(-8 - 6*ArcSin[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*(-(ArcSin[c*x]*(14 + 3*ArcSin[c*x])) + 28*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(4 + 4*ArcSin[c*x] - 6*ArcSin[c*x]^2 + 56*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + Sqrt[1 - c^2*x^2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]))*Sin[ArcSin[c*x]/2]))/(3*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) + (b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-3*I)*Pi*ArcSin[c*x] + (4*ArcSin[c*x])/(-1 + c*x) - (1 - I)*ArcSin[c*x]^2 - (2*ArcSin[c*x]^2)/(-1 + c*x) - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Log[1 + I*E^(I*ArcSin[c*x])] - 4*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (2*(4 + ArcSin[c*x]^2 + c*x*(-4 + ArcSin[c*x]^2))*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3))/(3*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(6 + (6*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (2*(-2 + ArcSin[c*x])*ArcSin[c*x])/((-1 + c*x)*Sqrt[1 - c^2*x^2]) - 3*ArcSin[c*x]^2 - ((13 - 13*I)*ArcSin[c*x]^2)/Sqrt[1 - c^2*x^2] + (3*ArcSin[c*x]^3)/Sqrt[1 - c^2*x^2] + (13*((-3*I)*Pi*ArcSin[c*x] - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 2*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3) + (2*(4 - 13*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]))))/(3*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (2*b^2*d^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-21*I)*Pi*ArcSin[c*x] - (2*(-2 + ArcSin[c*x])*ArcSin[c*x])/(-1 + c*x) - (7 - 7*I)*ArcSin[c*x]^2 + ArcSin[c*x]^3 - 28*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 14*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x])] + 28*Pi*Log[Cos[ArcSin[c*x]/2]] - 14*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (28*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3 + (2*(4 - 7*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])))/(3*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (a*b*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(3*Cos[(5*ArcSin[c*x])/2] + 3*ArcSin[c*x]*Cos[(5*ArcSin[c*x])/2] + Cos[ArcSin[c*x]/2]*(-20 - 24*ArcSin[c*x] + 27*ArcSin[c*x]^2 - 156*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*(9 - 35*ArcSin[c*x] - 9*ArcSin[c*x]^2 + 52*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 20*Sin[ArcSin[c*x]/2] - 24*ArcSin[c*x]*Sin[ArcSin[c*x]/2] - 27*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2] + 156*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]*Sin[ArcSin[c*x]/2] + 9*Sin[(3*ArcSin[c*x])/2] + 35*Ar

```
cSin[c*x]*Sin[(3*ArcSin[c*x])/2] - 9*ArcSin[c*x]^2*Sin[(3*ArcSin[c*x])/2] +
 52*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]*Sin[(3*ArcSin[c*x])/2] - 3
*Sin[(5*ArcSin[c*x])/2] + 3*ArcSin[c*x]*Sin[(5*ArcSin[c*x])/2]))/(6*c*e^3*S
qrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]))
```

Maple [F]

$$\int \frac{(cdx+d)^{\frac{5}{2}} (a+b\arcsin(cx))^2}{(-cex+e)^{\frac{5}{2}}}dx$$

```
[In] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

Fricas [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{(-cex+e)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c^2*d^2*x^2 + 2*a^2*c*d^2*x + a^2*d^2 + (b^2*c^2*d^2*x^2 + 2
*b^2*c*d^2*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x
+ a*b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^3*e^3*x^3 - 3*c
^2*e^3*x^2 + 3*c*e^3*x - e^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(5/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \int \frac{(cdx+d)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{(-cex+e)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(5/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(5/2)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{5/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{5/2}}{(e-c\,e\,x)^{5/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(5/2))/(e - c*e*x)^(5/2),x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(5/2))/(e - c*e*x)^(5/2), x)
```

3.571 $\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 544

$$\begin{aligned}
&\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \\
&-\frac{8id^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&-\frac{32bd^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&-\frac{32ib^2d^4(1-c^2x^2)^{5/2}\,\mathrm{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&-\frac{4bd^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+\frac{8b^2d^4(1-c^2x^2)^{5/2}\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&-\frac{8d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+\frac{2d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}$$

```
[Out] -8/3*I*d^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x
+e)^(5/2)+1/3*d^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(5/2
)/(-c*e*x+e)^(5/2)-32/3*b*d^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1-I/(
I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-32/3*I*b^2*d^
4*(-c^2*x^2+1)^(5/2)*polylog(2,I/(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5
/2)/(-c*e*x+e)^(5/2)-4/3*b*d^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*sec(1/4
```

```
*Pi+1/2*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+8/3*b^2*d^4*(-c^2
*x^2+1)^(5/2)*tan(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2
)-8/3*d^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*tan(1/4*Pi+1/2*arcsin(c*x)
)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*d^4*(-c^2*x^2+1)^(5/2)*(a+b*arcsin
(c*x))^2*sec(1/4*Pi+1/2*arcsin(c*x))^2*tan(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x
+d)^(5/2)/(-c*e*x+e)^(5/2)
```

Rubi [A] (verified)

Time = 0.78 (sec) , antiderivative size = 544, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.406$, Rules used = {4763, 4859, 4737, 4857, 3399, 4271, 3852, 8, 4269, 3798, 2221, 2317, 2438}

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \frac{d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{8id^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{32bd^4(1-c^2x^2)^{5/2}\log\left(1-ie^{-i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{8d^4(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{4bd^4(1-c^2x^2)^{5/2}\sec^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{2d^4(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\sec^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{32ib^2d^4(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{8b^2d^4(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}$$

```
[In] Int[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]

[Out] (((-8*I)/3)*d^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(
5/2)*(e - c*e*x)^(5/2)) + (d^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^3)/(
3*b*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (32*b*d^4*(1 - c^2*x^2)^(5/2)*
(a + b*ArcSin[c*x])*Log[1 - I/E^(I*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e
 - c*e*x)^(5/2)) - (((32*I)/3)*b^2*d^4*(1 - c^2*x^2)^(5/2)*PolyLog[2, I/E^(
I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (4*b*d^4*(1 - c^
2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d
*x)^(5/2)*(e - c*e*x)^(5/2)) + (8*b^2*d^4*(1 - c^2*x^2)^(5/2)*Tan[Pi/4 + Ar
cSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (8*d^4*(1 - c^2*x
^2)^(5/2)*(a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)
^(5/2)*(e - c*e*x)^(5/2)) + (2*d^4*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^
```

```
2*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(
5/2)*(e - c*e*x)^(5/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4271

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> Simp[(-b^2)*(c + d*x)^m*Cot[e + f*x]*((b*Csc[e + f*x])^(n - 2)/(f*(n
- 1))), x] + (Dist[b^2*d^2*m*((m - 1)/(f^2*(n - 1)*(n - 2))), Int[(c + d*x)
^(m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[b^2*((n - 2)/(n - 1)), Int
[(c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[b^2*d*m*(c + d*x)^(m -
 1)*((b*Csc[e + f*x])^(n - 2)/(f^2*(n - 1)*(n - 2))), x]) /; FreeQ[{b, c, d
, e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int \frac{(d+cdx)^4(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{(1-c^2x^2)^{5/2}\int \left(\frac{d^4(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} + \frac{4d^4(a+b\arcsin(cx))^2}{(-1+cx)^2\sqrt{1-c^2x^2}} + \frac{4d^4(a+b\arcsin(cx))^2}{(-1+cx)\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(d^4(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(4d^4(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(-1+cx)^2\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(4d^4(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(-1+cx)\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(4d^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{-c+c\sin(x)}\,dx, x, \arcsin(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(4cd^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{(-c+c\sin(x))^2}\,dx, x, \arcsin(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(d^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int (a+bx)^2\csc^4\left(\frac{\pi}{4}-\frac{x}{2}\right)dx, x, \arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2d^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int (a+bx)^2\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)dx, x, \arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4bd^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2d^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)^2\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(8bd^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)\cot\left(\frac{\pi}{4}-\frac{x}{2}\right)dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(4b^2d^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{4id^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4bd^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{8d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(8bd^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)\cot\left(\frac{\pi}{4}-\frac{x}{2}\right)dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(16bd^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{e^{-ix}(a+bx)}{1-ie^{-ix}}dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(8b^2d^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int 1\,dx,x,\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{8id^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{8b^2d^4(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{16bd^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{4bd^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{8d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{2d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(16bd^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{e^{-ix}(a+bx)}{1-ie^{-ix}}\,dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(16b^2d^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \log\left(1-ie^{-ix}\right)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{8id^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{8b^2d^4(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{32bd^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{4bd^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{8d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{2d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(16ib^2d^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{-i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(16b^2d^4(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \log\left(1-ie^{-ix}\right)\,dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=-\frac{8id^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{8b^2d^4(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{32bd^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{16ib^2d^4(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{4bd^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{8d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{2d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{\left(16ib^2d^4(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=-\frac{8id^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^3}{3bc(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{8b^2d^4(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{32bd^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{32ib^2d^4(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{4bd^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{8d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{2d^4(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1419 vs. $2(544) = 1088$.

Time = 15.57 (sec) , antiderivative size = 1419, normalized size of antiderivative = 2.61

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \frac{\sqrt{-e(-1+cx)}\sqrt{d(1+cx)}\left(\frac{4a^2d}{3e^3(-1+cx)^2}+\frac{8a^2d}{3e^3(-1+cx)}\right)}{c}$$

$$-\frac{a^2d^{3/2}\arctan\left(\frac{cx\sqrt{-e(-1+cx)}\sqrt{d(1+cx)}}{\sqrt{d}\sqrt{e}(-1+cx)(1+cx)}\right)}{ce^{5/2}}$$

$$+\frac{abd\sqrt{d+cdx}\sqrt{e-cex}\sqrt{-de\,(1-c^2x^2)}\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)\left(-4+3\arcsin(cx)-6\log\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)\right.\right.\right.}{}$$

$$+\frac{abd\sqrt{d+cdx}\sqrt{e-cex}\sqrt{-de\,(1-c^2x^2)}\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)\left(-8-6\arcsin(cx)+9\arcsin(cx)^2-84\log\left(\mathrm{co}\right.\right.\right.}{}$$

$$+\frac{b^2d(1+cx)\sqrt{d+cdx}\sqrt{e-cex}\sqrt{-de\,(1-c^2x^2)}\left(-3i\pi\arcsin(cx)+\frac{4\arcsin(cx)}{-1+cx}-(1-i)\arcsin(cx)^2-\frac{2\arcsin}{-}\right.}{}$$

$$+\frac{b^2d(1+cx)\sqrt{d+cdx}\sqrt{e-cex}\sqrt{-de\,(1-c^2x^2)}\left(-21i\pi\arcsin(cx)-\frac{2(-2+\arcsin(cx))\arcsin(cx)}{-1+cx}-(7-7i)\arcs\right.}{}$$

```
[In] Integrate[((d + c*d*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((4*a^2*d)/(3*e^3*(-1 + c*x)^2) +
(8*a^2*d)/(3*e^3*(-1 + c*x))))/c - (a^2*d^(3/2)*ArcTan[(c*x*Sqrt[-(e*(-1 +
c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*(1 + c*x))])/(c*e^(5/
2)) + (a*b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Co
s[ArcSin[c*x]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSi
n[c*x]/2]]) - Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Log[Cos[ArcSin[c*x]/2
] - Sin[ArcSin[c*x]/2]]) + 2*(2 + 2*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[
c*x] + 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 2*Sqrt[1 - c^2*x^2]
*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(3*c*e^
3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^
4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) + (a*b*d*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(-8 - 6*ArcSin[c*
x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + C
os[(3*ArcSin[c*x])/2]*(-(ArcSin[c*x]*(14 + 3*ArcSin[c*x])) + 28*Log[Cos[Arc
Sin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(4 + 4*ArcSin[c*x] - 6*ArcSin[c*x]^2
 + 56*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + Sqrt[1 - c^2*x^2]*((14
 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]
/2]]))*Sin[ArcSin[c*x]/2]))/(6*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[Ar
```

```
cSin[c*x]/2] - Sin[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2])) + (b^2*d*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2
*x^2))]*((-3*I)*Pi*ArcSin[c*x] + (4*ArcSin[c*x])/(-1 + c*x) - (1 - I)*ArcSi
n[c*x]^2 - (2*ArcSin[c*x]^2)/(-1 + c*x) - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])
] + 2*Pi*Log[1 + I*E^(I*ArcSin[c*x])] - 4*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin
[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])
/4]] + (4*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (2*(4 + ArcSin[c*x]^2 + c
*x*(-4 + ArcSin[c*x]^2))*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcS
in[c*x]/2])^3))/(3*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (b^2*d*(1 + c*x)*Sqrt[d + c*d
*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-21*I)*Pi*ArcSin[c*x] - (2
*(-2 + ArcSin[c*x])*ArcSin[c*x])/(-1 + c*x) - (7 - 7*I)*ArcSin[c*x]^2 + Arc
Sin[c*x]^3 - 28*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 14*(Pi - 2*ArcSin[c*x])*
Log[1 + I*E^(I*ArcSin[c*x])] + 28*Pi*Log[Cos[ArcSin[c*x]/2]] - 14*Pi*Log[-C
os[(Pi + 2*ArcSin[c*x])/4]] + (28*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (
4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2
])^3 + (2*(4 - 7*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - S
in[ArcSin[c*x]/2])))/(3*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x
^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2)
```

Maple [F]

$$\int \frac{(cdx+d)^{\frac{3}{2}} (a+b \arcsin (cx))^2}{(-cex+e)^{\frac{5}{2}}}dx$$

```
[In] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

Fricas [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{(-cex+e)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c*d*x + a^2*d + (b^2*c*d*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*c
*d*x + a*b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^3*e^3*x^3 -
3*c^2*e^3*x^2 + 3*c*e^3*x - e^3), x)
```

Sympy [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \int \frac{(d(cx+1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))^2}{(-e\,(cx-1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)**(3/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(5/2),x)
```

```
[Out] Integral((d*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/(-e*(c*x - 1))**(5/2), x
)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(b\arcsin\,(cx)+a)^2}{(-cex+e)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{3/2}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(d+c\,d\,x\right)^{3/2}}{\left(e-c\,e\,x\right)^{5/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2))/(e - c*e*x)^(5/2),x)
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2))/(e - c*e*x)^(5/2), x)
```

3.572 $\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 486

$$
\begin{aligned}
\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx &= -\frac{id^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{4ib^2d^3(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{2bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{4b^2d^3(1-c^2x^2)^{5/2}\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{d^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{d^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

```
[Out] -1/3*I*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x
+e)^(5/2)-4/3*b*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1-I/(I*c*x+(-c^
2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-4/3*I*b^2*d^3*(-c^2*x^2
+1)^(5/2)*polylog(2,I/(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x
+e)^(5/2)-2/3*b*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*sec(1/4*Pi+1/2*arc
sin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+4/3*b^2*d^3*(-c^2*x^2+1)^(5/
2)*tan(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*d^3*(
-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*tan(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+
d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*d^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2*se
```

```
c(1/4*Pi+1/2*arcsin(c*x))^2*tan(1/4*Pi+1/2*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(
-c*e*x+e)^(5/2)
```

Rubi [A] (verified)

Time = 0.73 (sec) , antiderivative size = 486, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4763, 4859, 4857, 3399, 4271, 3852, 8, 4269, 3798, 2221, 2317, 2438}

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = -\frac{id^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{4bd^3(1-c^2x^2)^{5/2}\log\left(1-ie^{-i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{d^3(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{2bd^3(1-c^2x^2)^{5/2}\sec^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{d^3(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\sec^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{4ib^2d^3(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{4b^2d^3(1-c^2x^2)^{5/2}\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}}$$

```
[In] Int[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

```
[Out] ((-1/3*I)*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/
2)*(e - c*e*x)^(5/2)) - (4*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*Lo
g[1 - I/E^(I*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((
4*I)/3)*b^2*d^3*(1 - c^2*x^2)^(5/2)*PolyLog[2, I/E^(I*ArcSin[c*x])])/(c*(d
+ c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (2*b*d^3*(1 - c^2*x^2)^(5/2)*(a + b*Arc
Sin[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(
5/2)) + (4*b^2*d^3*(1 - c^2*x^2)^(5/2)*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d +
 c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c
*x])^2*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
 + (d^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]/2]
^2*Tan[Pi/4 + ArcSin[c*x]/2])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3399

```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Dist[(2*a)^n, Int[(c + d*x)^m*Sin[(1/2)*(e + Pi*(a/(2*b))) +
 f*(x/2)]^(2*n), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[a^2 - b^2
, 0] && IntegerQ[n] && (GtQ[n, 0] || IGtQ[m, 0])
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 3852

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> Dist[-d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 4269

```
Int[csc[(e_.) + (f_.)*(x_)]^2*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp
[(-(c + d*x)^m)*(Cot[e + f*x]/f), x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*
Cot[e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 4271

```
Int[(csc[(e_.) + (f_.)*(x_)]*(b_.))^(n_)*((c_.) + (d_.)*(x_))^(m_), x_Symbo
l] :> Simp[(-b^2)*(c + d*x)^m*Cot[e + f*x]*((b*Csc[e + f*x])^(n - 2)/(f*(n
```

```
- 1))), x] + (Dist[b^2*d^2*m*((m - 1)/(f^2*(n - 1)*(n - 2))), Int[(c + d*x)
^(m - 2)*(b*Csc[e + f*x])^(n - 2), x], x] + Dist[b^2*((n - 2)/(n - 1)), Int
[(c + d*x)^m*(b*Csc[e + f*x])^(n - 2), x], x] - Simp[b^2*d*m*(c + d*x)^(m -
 1)*((b*Csc[e + f*x])^(n - 2)/(f^2*(n - 1)*(n - 2))), x]) /; FreeQ[{b, c, d
, e, f}, x] && GtQ[n, 1] && NeQ[n, 2] && GtQ[m, 1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4857

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Dist[1/(c^(m + 1)*Sqrt[d]), Subst[Int
[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c,
 d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (Gt
Q[m, 0] || IGtQ[n, 0])
```

Rule 4859

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{(1-c^2x^2)^{5/2}\int \frac{(d+cdx)^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}\\
&= \frac{(1-c^2x^2)^{5/2}\int \left(\frac{2d^3(a+b\arcsin(cx))^2}{(-1+cx)^2\sqrt{1-c^2x^2}}+\frac{d^3(a+b\arcsin(cx))^2}{(-1+cx)\sqrt{1-c^2x^2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}\\
&= \frac{\left(d^3(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(-1+cx)\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(2d^3(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(-1+cx)^2\sqrt{1-c^2x^2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}\\
&= \frac{\left(d^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{-c+c\sin(x)}\,dx,x,\arcsin(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}}\\
&\quad+\frac{\left(2cd^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{(a+bx)^2}{(-c+c\sin(x))^2}\,dx,x,\arcsin(cx)\right)}{(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

$$= -\frac{\left(d^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int (a+bx)^2\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{2c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(d^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int (a+bx)^2\csc^4\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{2c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{2bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{d^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(d^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int (a+bx)^2\csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2bd^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int (a+bx)\cot\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2b^2d^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \csc^2\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{id^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{d^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(4bd^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int (a+bx)\cot\left(\frac{\pi}{4}-\frac{x}{2}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(4bd^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{e^{-ix}(a+bx)}{1-ie^{-ix}}\,dx,x,\arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(4b^2d^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int 1\,dx,x,\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{id^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4b^2d^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{2bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{d^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{d^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(8bd^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{e^{-ix}(a+bx)}{1-ie^{-ix}}\,dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(4b^2d^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \log\left(1-ie^{-ix}\right)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{id^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4b^2d^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{2bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{d^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{d^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(4ib^2d^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{-i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(8b^2d^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \log\left(1-ie^{-ix}\right)\,dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{id^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4b^2d^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4ib^2d^3(1-c^2x^2)^{5/2}\text{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{d^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(8ib^2d^3(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{id^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4b^2d^3(1-c^2x^2)^{5/2}\cot\left(\frac{\pi}{4}-\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{4ib^2d^3(1-c^2x^2)^{5/2}\text{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2bd^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{d^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^3(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

Mathematica [A] (warning: unable to verify)

Time = 10.90 (sec) , antiderivative size = 687, normalized size of antiderivative = 1.41

$$\int\frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \frac{\sqrt{-e(-1+cx)}\sqrt{d(1+cx)}\left(\frac{2a^2}{3e^3(-1+cx)^2}+\frac{a^2}{3e^3(-1+cx)}\right)}{c} + \frac{ab\sqrt{d+cdx}\sqrt{e-cex}\sqrt{-de\left(1-c^2x^2\right)}\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)\left(-4+3\arcsin(cx)-6\log\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)-\right.\right.\right.}{} + \frac{b^2(1+cx)\sqrt{d+cdx}\sqrt{e-cex}\sqrt{-de\left(1-c^2x^2\right)}\left(-3i\pi\arcsin(cx)+\frac{4\arcsin(cx)}{-1+cx}-(1-i)\arcsin(cx)^2-\frac{2\arcsin}{-1+}\right.}{}$$

```
[In] Integrate[(Sqrt[d + c*d*x]*(a + b*ArcSin[c*x])^2)/(e - c*e*x)^(5/2),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((2*a^2)/(3*e^3*(-1 + c*x)^2) + a^
2/(3*e^3*(-1 + c*x))))/c + (a*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*
(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2]*(-4 + 3*ArcSin[c*x] - 6*Log[Cos[ArcSin[
c*x]/2] - Sin[ArcSin[c*x]/2]]) - Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Lo
g[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(2 + 2*ArcSin[c*x] + Sqrt[1
 - c^2*x^2]*ArcSin[c*x] + 4*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] +
2*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*Sin[ArcSi
n[c*x]/2]))/(3*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] - S
in[ArcSin[c*x]/2])^4*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) + (b^2*(1 +
 c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*((-3*I)*Pi
*ArcSin[c*x] + (4*ArcSin[c*x])/(-1 + c*x) - (1 - I)*ArcSin[c*x]^2 - (2*ArcS
in[c*x]^2)/(-1 + c*x) - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Log[1 + I
*E^(I*ArcSin[c*x])] - 4*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] + 4*Pi*Log
[Cos[ArcSin[c*x]/2]] - 2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyL
og[2, (-I)*E^(I*ArcSin[c*x])] + (2*(4 + ArcSin[c*x]^2 + c*x*(-4 + ArcSin[c*
x]^2))*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3))/(3
*c*e^3*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2]
 + Sin[ArcSin[c*x]/2])^2)
```

Maple [F]

$$\int \frac{\sqrt{cdx+d}\,(a+b\arcsin(cx))^{2}}{(-cex+e)^{\frac{5}{2}}}dx$$

```
[In] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

```
[Out] int((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x)
```

Fricas [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \int \frac{\sqrt{cdx+d}(b\arcsin(cx)+a)^{2}}{(-cex+e)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^3*e^3*x^3 - 3*c^2*e^3*x^2 + 3*c*e^3*x - e^3), x)
```

Sympy [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \int \frac{\sqrt{d\,(cx+1)}(a+b\,\text{asin}\,(cx))^2}{(-e\,(cx-1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)**(1/2)*(a+b*asin(c*x))**2/(-c*e*x+e)**(5/2),x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*(a + b*asin(c*x))**2/(-e*(c*x - 1))**(5/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \int \frac{\sqrt{cdx+d}(b\arcsin\,(cx)+a)^2}{(-cex+e)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(a+b*arcsin(c*x))^2/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*(b*arcsin(c*x) + a)^2/(-c*e*x + e)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d+cdx}(a+b\arcsin(cx))^2}{(e-cex)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}}{(e-c\,e\,x)^{5/2}}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2))/(e - c*e*x)^(5/2),x)
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2))/(e - c*e*x)^(5/2), x)
```

3.573 $\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 896

$$
\begin{aligned}
\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx &= \frac{2b^2d^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{2b^2d^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b^2d^2(1-c^2x^2)^{5/2}\arcsin(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2bd^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{bcd^2x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2d^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{2d^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{id^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{4ibd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{2ib^2d^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{2ib^2d^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{ib^2d^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

```
[Out] 2/3*b^2*d^2*(-c^2*x^2+1)^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*b^2*d^2*x
*(-c^2*x^2+1)^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b^2*d^2*(-c^2*x^2+1)^(
5/2)*arcsin(c*x)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*d^2*(-c^2*x^2+1)^
(3/2)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*b*d^2*x*(-c^
2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*c*d
^2*x^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2
)+2/3*d^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/
2)+1/3*d^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5
/2)+1/3*c^2*d^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*
x+e)^(5/2)+2/3*d^2*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c
*e*x+e)^(5/2)-1/3*I*b^2*d^2*(-c^2*x^2+1)^(5/2)*polylog(2,-(I*c*x+(-c^2*x^2+
1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*b^2*d^2*(-c^2*x^2+1)^
(5/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)
^(5/2)+2/3*b*d^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2
+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+4/3*I*b*d^2*(-c^2*x^2+1)^(
5/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+d)^(5/2)/(
-c*e*x+e)^(5/2)+2/3*I*b^2*d^2*(-c^2*x^2+1)^(5/2)*polylog(2,I*(I*c*x+(-c^2*x
^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*I*d^2*(-c^2*x^2+1)^(5/
2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)
```

Rubi [A] (verified)

Time = 0.82 (sec) , antiderivative size = 896, normalized size of antiderivative = 1.00, number of steps used = 30, number of rules used = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.562$, Rules used = {4763, 4847, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 4749, 4266, 267,

4771, 4791, 294, 222}

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \frac{c^2d^2(1-c^2x^2)\,(a+b\arcsin(cx))^2x^3}{3(cxd+d)^{5/2}(e-cex)^{5/2}}
- \frac{bcd^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))x^2}{3(cxd+d)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^2(1-c^2x^2)^2\,x}{3(cxd+d)^{5/2}(e-cex)^{5/2}}
+ \frac{2d^2(1-c^2x^2)^2\,(a+b\arcsin(cx))^2x}{3(cxd+d)^{5/2}(e-cex)^{5/2}} + \frac{d^2(1-c^2x^2)\,(a+b\arcsin(cx))^2x}{3(cxd+d)^{5/2}(e-cex)^{5/2}}
- \frac{2bd^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))x}{3(cxd+d)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^2(1-c^2x^2)^2}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}
- \frac{id^2(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}{3c(cxd+d)^{5/2}(e-cex)^{5/2}} + \frac{2d^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}
- \frac{b^2d^2(1-c^2x^2)^{5/2}\arcsin(cx)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}} - \frac{bd^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}
+ \frac{4ibd^2(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}
+ \frac{2bd^2(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}
- \frac{2ib^2d^2(1-c^2x^2)^{5/2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}
+ \frac{2ib^2d^2(1-c^2x^2)^{5/2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}
- \frac{ib^2d^2(1-c^2x^2)^{5/2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(cxd+d)^{5/2}(e-cex)^{5/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)),x]
```

```
[Out] (2*b^2*d^2*(1 - c^2*x^2)^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*
b^2*d^2*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b^2*d
^2*(1 - c^2*x^2)^(5/2)*ArcSin[c*x])/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2
)) - (b*d^2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)
*(e - c*e*x)^(5/2)) - (2*b*d^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(
3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*c*d^2*x^2*(1 - c^2*x^2)^(3/2)*(
a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*d^2*(1 - c
^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) +
(d^2*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) + (c^2*d^2*x^3*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)
^(5/2)*(e - c*e*x)^(5/2)) + (2*d^2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)
/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - ((I/3)*d^2*(1 - c^2*x^2)^(5/2)*(
a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((4*I)/3)*
b*d^2*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c
```

```
*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*b*d^2*(1 - c^2*x^2)^(5/2)*(a + b
*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c
*e*x)^(5/2)) - (((2*I)/3)*b^2*d^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I*
ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((2*I)/3)*b^2*d^2
*(1 - c^2*x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*
(e - c*e*x)^(5/2)) - ((I/3)*b^2*d^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I
)*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 294

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(
n - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*n*(p + 1))), x] - Dist[c^n
*((m - n + 1)/(b*n*(p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
```

```
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int \frac{(d+cdx)^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{(1-c^2x^2)^{5/2}\int \left(\frac{d^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}+\frac{2cd^2x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}+\frac{c^2d^2x^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{\left(d^2(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2cd^2(1-c^2x^2)^{5/2}\right)\int \frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(c^2d^2(1-c^2x^2)^{5/2}\right)\int \frac{x^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2d^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2d^2(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(4bd^2(1-c^2x^2)^{5/2}\right)\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2bcd^2(1-c^2x^2)^{5/2}\right)\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2bc^3d^2(1-c^2x^2)^{5/2}\right)\int \frac{x^3(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2bd^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bcd^2x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2d^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2d^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2bd^2(1-c^2x^2)^{5/2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(b^2d^2(1-c^2x^2)^{5/2}\right)\int \frac{1}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2bcd^2(1-c^2x^2)^{5/2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(4bcd^2(1-c^2x^2)^{5/2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2b^2cd^2(1-c^2x^2)^{5/2}\right)\int \frac{x}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(b^2c^2d^2(1-c^2x^2)^{5/2}\right)\int \frac{x^2}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{2b^2d^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2bd^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bcd^2x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2d^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2d^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(b^2d^2(1-c^2x^2)^{5/2}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2bd^2(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2bd^2(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(4bd^2(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{2b^2d^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2b^2d^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{b^2d^2(1-c^2x^2)^{5/2}\arcsin(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{2bd^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{bcd^2x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{c^2d^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{2d^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{id^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{4ibd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{\left(4ibd^2(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{\left(8ibd^2(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{\left(2b^2d^2(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{\left(2b^2d^2(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$
\begin{aligned}
&= \frac{2b^2d^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{b^2d^2(1-c^2x^2)^{5/2}\arcsin(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{2bd^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{bcd^2x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2d^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2d^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{id^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{4ibd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{\left(2ib^2d^2(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{\left(2ib^2d^2(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{\left(2b^2d^2(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{\left(4b^2d^2(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2b^2d^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{b^2d^2(1-c^2x^2)^{5/2}\arcsin(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{2bd^2x(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{bcd^2x^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2d^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{d^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2d^2x^3(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2d^2x(1-c^2x^2)^2\,(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{id^2(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{4ibd^2(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2bd^2(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{2ib^2d^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2ib^2d^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{\left(ib^2d^2(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{\left(2ib^2d^2(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{2b^2d^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{b^2d^2(1-c^2x^2)^{5/2}\arcsin(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{2bd^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{bcd^2x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2d^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2d^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{id^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{4ibd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{2ib^2d^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad + \frac{2ib^2d^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&\quad - \frac{ib^2d^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 6.54 (sec) , antiderivative size = 388, normalized size of antiderivative = 0.43

$$
\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \frac{\sqrt{d+cdx}\sqrt{e-cex}\left(-\frac{2a^2(-2+cx)}{(-1+cx)^2}+\frac{2ab\left(\cos\left(\frac{3}{2}\arcsin(cx)\right)\left(\arcsin(cx)-2\log\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)\right.\right.\right.}{}
$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)),x]
```

```
[Out] (Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((-2*a^2*(-2 + c*x))/(-1 + c*x)^2 + (2*a*b
*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Log[Cos[ArcSin[c*x]/2] - Sin[ArcS
in[c*x]/2]]) + Cos[ArcSin[c*x]/2]*(-2 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*
x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(1 - (-1 + Sqrt[1 - c^2*x^2])*ArcSin[c*x]
 - 2*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]])*S
in[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x
]/2])^3) + (b^2*((-8*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + ArcSin[c*x]*(8
*Log[1 + I*E^(I*ArcSin[c*x])] - 2*Sec[(Pi + 2*ArcSin[c*x])/4]^2) + 4*Tan[(P
```

```
i + 2*ArcSin[c*x])/4] + ArcSin[c*x]^2*(-2*I + (2 + Sec[(Pi + 2*ArcSin[c*x])
/4]^2)*Tan[(Pi + 2*ArcSin[c*x])/4])))/Sqrt[1 - c^2*x^2]))/(6*c*d*e^3)
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\,(-cex+e)^{\frac{5}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x)
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}(-cex+e)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^4*d*e^3*x^4 - 2*c^3*d*e^3*x^3 + 2*c*d*e^3*x - d*e^3), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{\sqrt{d(cx+1)}\,(-e(cx-1))^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(5/2),x)
[Out] Integral((a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*(-e*(c*x - 1))**(5/2)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}(-cex+e)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*(-c*e*x + e)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d+c\,d\,x}\,(e-c\,e\,x)^{5/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(5/2)), x)
```

3.574 $\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 709

$$
\begin{aligned}
\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx &= \frac{b^2d(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{b^2dx(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{bdx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2dx(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{2id(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{2ibd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{4bd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{ib^2d(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&+ \frac{ib^2d(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
&- \frac{2ib^2d(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

```
[Out] 1/3*b^2*d*(-c^2*x^2+1)^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*b^2*d*x*(-c
^2*x^2+1)^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*d*(-c^2*x^2+1)^(3/2)*(a+
```

```
b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*d*x*(-c^2*x^2+1)^(3
/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*d*(-c^2*x^2+1)*(
a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*d*x*(-c^2*x^2+1)*
(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*d*x*(-c^2*x^2+1)^2
*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*d*(-c^2*x^2+1)^
(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*I*b*d*(-c^
2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+
d)^(5/2)/(-c*e*x+e)^(5/2)+4/3*b*d*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1
+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*I*b^2
*d*(-c^2*x^2+1)^(5/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^
(5/2)/(-c*e*x+e)^(5/2)+1/3*I*b^2*d*(-c^2*x^2+1)^(5/2)*polylog(2,I*(I*c*x+(-
c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*b^2*d*(-c^2*x^2
+1)^(5/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*
x+e)^(5/2)
```

Rubi [A] (verified)

Time = 0.57 (sec) , antiderivative size = 709, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.438$, Rules used = {4763, 4847, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197, 4749, 4266, 267}

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \frac{2ibd(1-c^2x^2)^{5/2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{2id(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{2dx(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{bdx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{4bd(1-c^2x^2)^{5/2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{ib^2d(1-c^2x^2)^{5/2}\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{ib^2d(1-c^2x^2)^{5/2}\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{2ib^2d(1-c^2x^2)^{5/2}\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{b^2d(1-c^2x^2)^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{b^2dx(1-c^2x^2)^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)),x]
```

```
[Out] (b^2*d*(1 - c^2*x^2)^2)/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (b^2*d*
x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*d*(1 - c^2*
```

```
x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) -
 (b*d*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*(d + c*d*x)^(5/2)*(e -
c*e*x)^(5/2)) + (d*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c*(d + c*d*x)^(5
/2)*(e - c*e*x)^(5/2)) + (d*x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d +
c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (2*d*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]
)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (((2*I)/3)*d*(1 - c^2*x^2)^(
5/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (((2*
I)/3)*b*d*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])]
)/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*b*d*(1 - c^2*x^2)^(5/2)*(a +
 b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e -
 c*e*x)^(5/2)) - ((I/3)*b^2*d*(1 - c^2*x^2)^(5/2)*PolyLog[2, (-I)*E^(I*ArcS
in[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + ((I/3)*b^2*d*(1 - c^2*
x^2)^(5/2)*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) - (((2*I)/3)*b^2*d*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I)*ArcSin
[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4847

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{(1-c^2x^2)^{5/2}\int\frac{(d+cdx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}\\
&= \frac{(1-c^2x^2)^{5/2}\int\left(\frac{d(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}+\frac{cdx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\right)dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}\\
&= \frac{\left(d(1-c^2x^2)^{5/2}\right)\int\frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(cd(1-c^2x^2)^{5/2}\right)\int\frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}\\
&= \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}\\
&\quad+\frac{\left(2d(1-c^2x^2)^{5/2}\right)\int\frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{\left(2bd(1-c^2x^2)^{5/2}\right)\int\frac{a+b\arcsin(cx)}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}\\
&\quad-\frac{\left(2bcd(1-c^2x^2)^{5/2}\right)\int\frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}
$$

$$= -\frac{bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bdx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{2dx(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(bd(1-c^2x^2)^{5/2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(b^2d(1-c^2x^2)^{5/2}\right)\int \frac{1}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(4bcd(1-c^2x^2)^{5/2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{\left(b^2cd(1-c^2x^2)^{5/2}\right)\int \frac{x}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{b^2d(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2dx(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bdx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+ \frac{2dx(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(bd(1-c^2x^2)^{5/2}\right)\text{Subst}(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$- \frac{\left(4bd(1-c^2x^2)^{5/2}\right)\text{Subst}(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{b^2d(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2dx(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bdx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2dx(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2id(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2ibd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(8ibd(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(b^2d(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(b^2d(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{b^2d(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{b^2dx(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bdx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2dx(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2id(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2ibd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4bd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(ib^2d(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(ib^2d(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(4b^2d(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{b^2d(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{b^2dx(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{bdx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{2dx(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{2id(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{2ibd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{4bd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{ib^2d(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{ib^2d(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{\left(2ib^2d(1-c^2x^2)^{5/2}\right)\operatorname{Subst}\left(\int\frac{\log(1+x)}{x}dx,x,e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{b^2d(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{b^2dx(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{bd(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{bdx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{d(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{dx(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{2dx(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{2id(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{2ibd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{4bd(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{ib^2d(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$+\frac{ib^2d(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$
$$-\frac{2ib^2d(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

Mathematica [A] (warning: unable to verify)

Time = 9.90 (sec) , antiderivative size = 764, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \frac{\sqrt{-e(-1+cx)}\sqrt{d(1+cx)}\left(\frac{a^2}{6d^2e^3(-1+cx)^2}-\frac{5a^2}{12d^2e^3(-1+cx)}-\frac{a^2}{4d^2e^3(1+cx)}\right)}{c} - \frac{ab\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}\left(2\arcsin(cx)(2cx+\cos(2\arcsin(cx)))+\sqrt{1-c^2x^2}\left(-1+5\log\left(\cos\left(\frac{1}{2}\text{ar}\right.\right.\right.\right.}{3cde^2\sqrt{(-d-cdx)(e-c}} - \frac{b^2\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}\left(9i\pi\arcsin(cx)-\frac{(-2+\arcsin(cx))\arcsin(cx)}{-1+cx}+(1-4i)\arcsin(cx)^2+16\pi\log\left(\right.\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)),x]
```

```
[Out] (Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*(a^2/(6*d^2*e^3*(-1 + c*x)^2) - (5
*a^2)/(12*d^2*e^3*(-1 + c*x)) - a^2/(4*d^2*e^3*(1 + c*x))))/c - (a*b*Sqrt[d
 + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(2*ArcSin[c*x]*(2*c*x + Cos[2*A
rcSin[c*x]]) + Sqrt[1 - c^2*x^2]*(-1 + 5*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSi
n[c*x]/2]] + 3*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - c*x*(5*Log[Co
s[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 3*Log[Cos[ArcSin[c*x]/2] + Sin[Arc
Sin[c*x]/2]]))))/(3*c*d*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[-(d*e*(1 -
c^2*x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3*(Cos[ArcSin[c*x]/2]
+ Sin[ArcSin[c*x]/2])) - (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*
x^2]*((9*I)*Pi*ArcSin[c*x] - ((-2 + ArcSin[c*x])*ArcSin[c*x])/(-1 + c*x) +
(1 - 4*I)*ArcSin[c*x]^2 + 16*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + 3*(Pi + 2*A
rcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] - 5*(Pi - 2*ArcSin[c*x])*Log[1 + I
*E^(I*ArcSin[c*x])] - 16*Pi*Log[Cos[ArcSin[c*x]/2]] + 5*Pi*Log[-Cos[(Pi + 2
*ArcSin[c*x])/4]] - 3*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (10*I)*PolyLog[
2, (-I)*E^(I*ArcSin[c*x])] - (6*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] + (2*Arc
Sin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3
+ ((4 + 5*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcS
in[c*x]/2]) + (3*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2])))/(6*c*d*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[-(d*e*(1
 - c^2*x^2))])
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{5}{2}}}dx$$

[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x)

[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x)

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x, algorithm ="fricas")

[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^5*d^2*e^3*x^5 - c^4*d^2*e^3*x^4 - 2*c^3*d^2*e^3*x^3 + 2*c^2*d^2*e^3*x^2 + c*d^2*e^3*x - d^2*e^3), x)

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \text{Timed out}$$

[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(5/2),x)

[Out] Timed out

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x, algorithm ="maxima")

[Out] 1/6*a*b*c*(2*sqrt(d)*sqrt(e)/(c^3*d^2*e^3*x - c^2*d^2*e^3) + 3*log(c*x + 1)/(c^2*d^(3/2)*e^(5/2)) + 5*log(c*x - 1)/(c^2*d^(3/2)*e^(5/2))) - 2/3*a*b*(1/(sqrt(-c^2*d*e*x^2 + d*e)*c^2*d*e^2*x - sqrt(-c^2*d*e*x^2 + d*e)*c*d*e^2)

```
- 2*x/(sqrt(-c^2*d*e*x^2 + d*e)*d*e^2))*arcsin(c*x) - 1/3*a^2*(1/(sqrt(-c^2
*d*e*x^2 + d*e)*c^2*d*e^2*x - sqrt(-c^2*d*e*x^2 + d*e)*c*d*e^2) - 2*x/(sqrt
(-c^2*d*e*x^2 + d*e)*d*e^2)) + b^2*integrate(arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1))^2/((c^3*d*e^2*x^3 - c^2*d*e^2*x^2 - c*d*e^2*x + d*e^2)*sqrt(c*
x + 1)*sqrt(-c*x + 1)), x)/(sqrt(d)*sqrt(e))
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{5/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)), x)
```

3.575 $\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 366

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx &= \frac{b^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\ &- \frac{b(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\ &+ \frac{2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2i(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\ &+ \frac{4b(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\ &- \frac{2ib^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}\end{aligned}$$

```
[Out] 1/3*b^2*x*(-c^2*x^2+1)^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*(-c^2*x^2+1
)^(3/2)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+1/3*x*(-c^2*x^
2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*x*(-c^2*x^2+1
)^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*(-c^2*x^2+1)
^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+4/3*b*(-c^2*x
^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d
)^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*b^2*(-c^2*x^2+1)^(5/2)*polylog(2,-(I*c*x+(-c
^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 366, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {4763, 4747, 4745, 4765, 3800, 2221, 2317, 2438, 4767, 197}

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx = -\frac{2i(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{b(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{4b(1-c^2x^2)^{5/2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} - \frac{2ib^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(cdx+d)^{5/2}(e-cex)^{5/2}} + \frac{b^2x(1-c^2x^2)^2}{3(cdx+d)^{5/2}(e-cex)^{5/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)),x]
```

```
[Out] (b^2*x*(1 - c^2*x^2)^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) - (b*(1 - c
^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)
) + (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)*(e - c*e*x
)^(5/2)) + (2*x*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x])^2)/(3*(d + c*d*x)^(5/2)
*(e - c*e*x)^(5/2)) - (((2*I)/3)*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)
/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)) + (4*b*(1 - c^2*x^2)^(5/2)*(a + b*
ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c*(d + c*d*x)^(5/2)*(e - c*
e*x)^(5/2)) - (((2*I)/3)*b^2*(1 - c^2*x^2)^(5/2)*PolyLog[2, -E^((2*I)*ArcSi
n[c*x])])/(c*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4747

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Dist[(2*p + 3)/(2*d*(p + 1)), Int[(d + e*x^2)^(p + 1)*(a + b*Arc
Sin[c*x])^n, x], x] + Dist[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*
x^2)^p], Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x])
 /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -
1] && NeQ[p, -3/2]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\text{integral} = \frac{(1-c^2x^2)^{5/2}\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\,dx}{(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(2(1-c^2x^2)^{5/2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(2bc(1-c^2x^2)^{5/2}\right)\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= -\frac{b(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(b^2(1-c^2x^2)^{5/2}\right)\int \frac{1}{(1-c^2x^2)^{3/2}}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(4bc(1-c^2x^2)^{5/2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{3(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{b^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{\left(4b(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$= \frac{b^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2i(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{\left(8ib(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{b^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{b(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{2i(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{4b(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{\left(4b^2(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{b^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{b(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{2i(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{4b(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{\left(2ib^2(1-c^2x^2)^{5/2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

$$=\frac{b^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{b(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{2i(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}+\frac{4b(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}-\frac{2ib^2(1-c^2x^2)^{5/2}\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

Mathematica [A] (warning: unable to verify)

Time = 10.85 (sec) , antiderivative size = 722, normalized size of antiderivative = 1.97

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx = \frac{4a^2cx(3-2c^2x^2)+b^2\Big(cx+6cx\arcsin(cx)^2+4i\pi\arcsin(cx)\cos(3\arcsin(}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)),x]
```

```
[Out] (4*a^2*c*x*(3 - 2*c^2*x^2) + b^2*(c*x + 6*c*x*ArcSin[c*x]^2 + (4*I)*Pi*ArcS
in[c*x]*Cos[3*ArcSin[c*x]] - (2*I)*ArcSin[c*x]^2*Cos[3*ArcSin[c*x]] + 8*Pi*
Cos[3*ArcSin[c*x]]*Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Cos[3*ArcSin[c*x]]*
Log[1 - I*E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 - I*E
^(I*ArcSin[c*x])] - 2*Pi*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x])] +
4*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x])] - 8*Pi*Cos[3*
ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Cos[3*ArcSin[c*x]]*Log[-Cos[(Pi
 + 2*ArcSin[c*x])/4]] + 2*Sqrt[1 - c^2*x^2]*((-3*I)*ArcSin[c*x]^2 + ArcSin[
c*x]*(-2 + (6*I)*Pi + 6*Log[1 - I*E^(I*ArcSin[c*x])] + 6*Log[1 + I*E^(I*Arc
Sin[c*x])]) + 3*Pi*(4*Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 - I*E^(I*ArcSin
[c*x])] - Log[1 + I*E^(I*ArcSin[c*x])] - 4*Log[Cos[ArcSin[c*x]/2]] + Log[-C
os[(Pi + 2*ArcSin[c*x])/4]] - Log[Sin[(Pi + 2*ArcSin[c*x])/4]])) - 2*Pi*Cos
[3*ArcSin[c*x]]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (16*I)*(1 - c^2*x^2)^(3/
2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (16*I)*(1 - c^2*x^2)^(3/2)*PolyLog[
2, I*E^(I*ArcSin[c*x])] + Sin[3*ArcSin[c*x]] + 2*ArcSin[c*x]^2*Sin[3*ArcSin
[c*x]]) + 4*a*b*(Sqrt[1 - c^2*x^2]*(-1 + 2*Log[Cos[ArcSin[c*x]/2] - Sin[Arc
Sin[c*x]/2]] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + 2*Cos[2*Arc
Sin[c*x]]*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]])) + ArcSin[c*x]*(3*c*x + Sin[3*ArcSin[c*x]])))/
(12*d^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(c - c^3*x^2))
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{5}{2}}}\,dx$$

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{(cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x, algorithm
="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^6*d^3*e^3*x^6 - 3*c^4*d^3*e^3*x^4 + 3*c^2*d^3*e^3*x^2 - d^
3*e^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(5/2)/(-c*e*x+e)**(5/2),x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{(cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x, algorithm
="maxima")
```

```
[Out] 1/3*a*b*c*(1/(c^4*d^(5/2)*e^(5/2)*x^2 - c^2*d^(5/2)*e^(5/2)) + 2*log(c*x +
1)/(c^2*d^(5/2)*e^(5/2)) + 2*log(c*x - 1)/(c^2*d^(5/2)*e^(5/2))) + 2/3*a*b*
(x/((-c^2*d*e*x^2 + d*e)^(3/2)*d*e) + 2*x/(sqrt(-c^2*d*e*x^2 + d*e)*d^2*e^2
))*arcsin(c*x) + 1/3*a^2*(x/((-c^2*d*e*x^2 + d*e)^(3/2)*d*e) + 2*x/(sqrt(-c
^2*d*e*x^2 + d*e)*d^2*e^2)) + b^2*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))^2/((c^4*d^2*e^2*x^4 - 2*c^2*d^2*e^2*x^2 + d^2*e^2)*sqrt(c*x + 1
)*sqrt(-c*x + 1)), x)/(sqrt(d)*sqrt(e))
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{5}{2}}}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x, algorithm ="giac")

[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(5/2)*(-c*e*x + e)^(5/2)), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{5/2}\,(e-c\,e\,x)^{5/2}}\,dx$$

[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)),x)

[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)), x)

3.576 $\int x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 35, antiderivative size = 351

$$\begin{aligned}
&\int x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx \\
&= \frac{b^2x\sqrt{d+cdx}\sqrt{e-cex}}{64c^2}-\frac{1}{32}b^2x^3\sqrt{d+cdx}\sqrt{e-cex} \\
&\quad -\frac{b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{64c^3\sqrt{1-c^2x^2}}+\frac{bx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} \\
&\quad -\frac{bcx^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}-\frac{x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{8c^2} \\
&\quad +\frac{1}{4}x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2+\frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] 1/64*b^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^2-1/32*b^2*x^3*(c*d*x+d)^(1/2
)*(-c*e*x+e)^(1/2)-1/8*x*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/
2)/c^2+1/4*x^3*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)-1/64*b^
2*arcsin(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+1/8*b
*x^2*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c/(-c^2*x^2+1)^(1/2
)-1/8*b*c*x^4*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+
1)^(1/2)+1/24*(a+b*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/b/c^3/(-
c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 351, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4823, 4783, 4795, 4737, 4723, 327, 222}

$$\int x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$$
$$=\frac{bx^2\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}}-\frac{bcx^4\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}$$
$$-\frac{x\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2}{8c^2}+\frac{\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}}$$
$$+\frac{1}{4}x^3\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2-\frac{b^2\arcsin(cx)\sqrt{cdx+d}\sqrt{e-cex}}{64c^3\sqrt{1-c^2x^2}}$$
$$+\frac{b^2x\sqrt{cdx+d}\sqrt{e-cex}}{64c^2}-\frac{1}{32}b^2x^3\sqrt{cdx+d}\sqrt{e-cex}$$

```
[In] Int[x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (b^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(64*c^2) - (b^2*x^3*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x])/32 - (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(6
4*c^3*Sqrt[1 - c^2*x^2]) + (b*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*Ar
cSin[c*x]))/(8*c*Sqrt[1 - c^2*x^2]) - (b*c*x^4*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x]))/(8*Sqrt[1 - c^2*x^2]) - (x*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x]*(a + b*ArcSin[c*x])^2)/(8*c^2) + (x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x])^2)/4 + (Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcS
in[c*x])^3)/(24*b*c^3*Sqrt[1 - c^2*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
```

```
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{4}x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}} - \frac{\left(bc\sqrt{d+cdx}\sqrt{e-cex}\right)\int x^3(a+b\arcsin(cx))\,dx}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{bcx^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{8c^2} + \frac{1}{4}x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8c^2\sqrt{1-c^2x^2}} + \frac{\left(b\sqrt{d+cdx}\sqrt{e-cex}\right)\int x(a+b\arcsin(cx))\,dx}{4c\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{32}b^2x^3\sqrt{d+cdx}\sqrt{e-cex} + \frac{bx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} - \frac{bcx^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{8c^2} + \frac{1}{4}x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}} + \frac{\left(3b^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{32\sqrt{1-c^2x^2}} - \frac{\left(b^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}}$$

$$= \frac{b^2x\sqrt{d+cdx}\sqrt{e-cex}}{64c^2} - \frac{1}{32}b^2x^3\sqrt{d+cdx}\sqrt{e-cex} + \frac{bx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} - \frac{bcx^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{8c^2} + \frac{1}{4}x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}} + \frac{\left(3b^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{64c^2\sqrt{1-c^2x^2}} - \frac{\left(b^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{16c^2\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{b^2 x\sqrt{d+cdx}\sqrt{e-cex}}{64c^2} - \frac{1}{32}b^2x^3\sqrt{d+cdx}\sqrt{e-cex} \\
&\quad - \frac{b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{64c^3\sqrt{1-c^2x^2}} + \frac{bx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} \\
&\quad - \frac{bcx^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&\quad - \frac{x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{8c^2} \\
&\quad + \frac{1}{4}x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad + \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.30 (sec) , antiderivative size = 297, normalized size of antiderivative = 0.85

$$
\int x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx
$$

$$
= \frac{32b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 96a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right) - 12b\sqrt{d+cdx}\sqrt{e-}
$$

```
[In] Integrate[x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 96*a^2*Sqrt[d]*Sqrt
[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]
*Sqrt[e]*(-1 + c^2*x^2))] - 12*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x
]*(b*Cos[4*ArcSin[c*x]] + 4*a*Sin[4*ArcSin[c*x]]) - 24*b*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*ArcSin[c*x]^2*(-4*a + b*Sin[4*ArcSin[c*x]]) + 3*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(32*a^2*c*x*Sqrt[1 - c^2*x^2]*(-1 + 2*c^2*x^2) - 4*a*b*C
os[4*ArcSin[c*x]] + b^2*Sin[4*ArcSin[c*x]]))/(768*c^3*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$
\int x^2\sqrt{cdx+d}\,\sqrt{-cex+e}\,(a+b\arcsin(cx))^2\,dx
$$

```
[In] int(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [F]

$$\int x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int \sqrt{cdx+d}\sqrt{-cex+e}(b\arcsin(cx)+a)^2x^2\,dx$$

```
[In] integrate(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="fricas")
```

```
[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(c*d
*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F]

$$\int x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int x^2\sqrt{d(cx+1)}\sqrt{-e(cx-1)}(a+b\,\mathrm{asin}\,(cx))^2\,dx$$

```
[In] integrate(x**2*(c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Integral(x**2*sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$$
$$=\int\sqrt{cdx+d}\sqrt{-cex+e}(b\arcsin(cx)+a)^2x^2\,dx$$

```
[In] integrate(x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="giac")
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2*x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$$
$$=\int x^2\,(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}\,dx$$

```
[In] int(x^2*(a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2),x)
[Out] int(x^2*(a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2), x)
```

3.577 $\int x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 33, antiderivative size = 225

$$\begin{aligned}
&\int x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx\\
&=\frac{4b^2\sqrt{d+cdx}\sqrt{e-cex}}{9c^2}+\frac{2b^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{27c^2}\\
&\quad+\frac{2bx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}}-\frac{2bcx^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}\\
&\quad-\frac{\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c^2}
\end{aligned}$$

```
[Out] 4/9*b^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^2+2/27*b^2*(-c^2*x^2+1)*(c*d*x+d
)^(1/2)*(-c*e*x+e)^(1/2)/c^2-1/3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(c*d*x+d)
^(1/2)*(-c*e*x+e)^(1/2)/c^2+2/3*b*x*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e
*x+e)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/9*b*c*x^3*(a+b*arcsin(c*x))*(c*d*x+d)^(1
/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 225, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used

$= \{4823, 4767, 4739, 455, 45\}$

$$\int x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \frac{2bx\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} - \frac{(1-c^2x^2)\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2}{3c^2} - \frac{2bcx^3\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + \frac{2b^2(1-c^2x^2)\sqrt{cdx+d}\sqrt{e-cex}}{27c^2} + \frac{4b^2\sqrt{cdx+d}\sqrt{e-cex}}{9c^2}$$

```
[In] Int[x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (4*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(9*c^2) + (2*b^2*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*(1 - c^2*x^2))/(27*c^2) + (2*b*x*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x]))/(3*c*Sqrt[1 - c^2*x^2]) - (2*b*c*x^3*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) - (Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(3*c^2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
```

```
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c^2} \\
&\quad+\frac{\left(2b\sqrt{d+cdx}\sqrt{e-cex}\right)\int (1-c^2x^2)\,(a+b\arcsin(cx))\,dx}{3c\sqrt{1-c^2x^2}} \\
&= \frac{2bx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} \\
&\quad-\frac{2bcx^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&\quad-\frac{\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c^2} \\
&\quad-\frac{\left(2b^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}} \\
&= \frac{2bx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} \\
&\quad-\frac{2bcx^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&\quad-\frac{\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c^2} \\
&\quad-\frac{\left(b^2\sqrt{d+cdx}\sqrt{e-cex}\right)\operatorname{Subst}\left(\int \frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{3\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{2bx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} - \frac{2bcx^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} - \frac{\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c^2} - \frac{\left(b^2\sqrt{d+cdx}\sqrt{e-cex}\right)\mathrm{Subst}\left(\int\left(\frac{2}{3\sqrt{1-c^2x}}+\frac{1}{3}\sqrt{1-c^2x}\right)\,dx,x,x^2\right)}{3\sqrt{1-c^2x^2}}$$

$$= \frac{4b^2\sqrt{d+cdx}\sqrt{e-cex}}{9c^2} + \frac{2b^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{27c^2} + \frac{2bx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} - \frac{2bcx^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} - \frac{\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c^2}$$

Mathematica [A] (verified)

Time = 1.31 (sec) , antiderivative size = 178, normalized size of antiderivative = 0.79

$$\int x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \frac{\sqrt{d+cdx}\sqrt{e-cex}\left(6abcx\sqrt{1-c^2x^2}(-3+c^2x^2)+9a^2(-1+c^2x^2)^2-2b^2(7-8c^2x^2+c^4x^4)+6b\left(bcx\sqrt{1}\right.\right.}{27c^2\,(-1+c^2x^2)}$$

```
[In] Integrate[x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(6*a*b*c*x*Sqrt[1 - c^2*x^2]*(-3 + c^2*x^2
) + 9*a^2*(-1 + c^2*x^2)^2 - 2*b^2*(7 - 8*c^2*x^2 + c^4*x^4) + 6*b*(b*c*x*S
qrt[1 - c^2*x^2]*(-3 + c^2*x^2) + 3*a*(-1 + c^2*x^2)^2)*ArcSin[c*x] + 9*b^2
*(-1 + c^2*x^2)^2*ArcSin[c*x]^2))/(27*c^2*(-1 + c^2*x^2))
```

Maple [F]

$$\int x\sqrt{cdx+d}\,\sqrt{-cex+e}\,(a+b\arcsin(cx))^2\,dx$$

[In] int(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)

[Out] int(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 197, normalized size of antiderivative = 0.88

$$\int x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$$
$$= \frac{((9\,a^2-2\,b^2)c^4x^4-2\,(9\,a^2-8\,b^2)c^2x^2+9\,(b^2c^4x^4-2\,b^2c^2x^2+b^2)\arcsin(cx)^2+9\,a^2-14\,b^2+18\,(abc^4x}{2}$$

[In] integrate(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")

[Out] 1/27*((9*a^2 - 2*b^2)*c^4*x^4 - 2*(9*a^2 - 8*b^2)*c^2*x^2 + 9*(b^2*c^4*x^4 - 2*b^2*c^2*x^2 + b^2)*arcsin(c*x)^2 + 9*a^2 - 14*b^2 + 18*(a*b*c^4*x^4 - 2*a*b*c^2*x^2 + a*b)*arcsin(c*x) + 6*(a*b*c^3*x^3 - 3*a*b*c*x + (b^2*c^3*x^3 - 3*b^2*c*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^4*x^2 - c^2)

Sympy [F]

$$\int x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx=\int x\sqrt{d\,(cx+1)}\,\sqrt{-e\,(cx-1)}\,(a+b\,\mathrm{asin}\,(cx))^2\,dx$$

[In] integrate(x*(c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)

[Out] Integral(x*sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2, x)

Maxima [F(-2)]

Exception generated.

$$\int x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int \sqrt{cdx+d}\sqrt{-cex+e}(b\arcsin(cx)+a)^2x\,dx$$

```
[In] integrate(x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2*x, x)
```

Mupad [F(-1)]

Timed out.

$$\int x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int x\,(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}\,dx$$

```
[In] int(x*(a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2),x)
```

```
[Out] int(x*(a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2), x)
```

3.578 $\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 222

$$\begin{aligned}\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx =& -\frac{1}{4}b^2x\sqrt{d+cdx}\sqrt{e-cex} \\ &+ \frac{b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} \\ &- \frac{bcx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\ &+ \frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\ &+ \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}\end{aligned}$$

```
[Out] -1/4*b^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+1/2*x*(c*d*x+d)^(1/2)*(-c*e*x+e
)^(1/2)*(a+b*arcsin(c*x))^2+1/4*b^2*arcsin(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^
(1/2)/c/(-c^2*x^2+1)^(1/2)-1/2*b*c*x^2*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-
c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+1/6*(a+b*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(
-c*e*x+e)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 222, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used

$= \{4763, 4741, 4737, 4723, 327, 222\}$

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \frac{\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} - \frac{bcx^2\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{b^2\arcsin(cx)\sqrt{cdx+d}\sqrt{e-cex}}{4c\sqrt{1-c^2x^2}} - \frac{1}{4}b^2x\sqrt{cdx+d}\sqrt{e-cex}$$

```
[In] Int[Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/4*(b^2*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x]*ArcSin[c*x])/(4*c*Sqrt[1 - c^2*x^2]) - (b*c*x^2*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2]) + (x*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/2 + (Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*(a + b*ArcSin[c*x])^3)/(6*b*c*Sqrt[1 - c^2*x^2])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}}$$

$$= \frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} - \frac{\left(bc\sqrt{d+cdx}\sqrt{e-cex}\right)\int x(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{bcx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{bcx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}} + \frac{\left(b^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{4}b^2x\sqrt{d+cdx}\sqrt{e-cex} + \frac{b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} - \frac{bcx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 0.44 (sec) , antiderivative size = 288, normalized size of antiderivative = 1.30

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$$

$$= \frac{4b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 12a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right) + 6b\sqrt{d+cdx}\sqrt{e-ce}}{}$$

```
[In] Integrate[Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (4*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 12*a^2*Sqrt[d]*Sqrt[
e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*
Sqrt[e]*(-1 + c^2*x^2))] + 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*
(b*Cos[2*ArcSin[c*x]] + 2*a*Sin[2*ArcSin[c*x]]) + 6*b*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*ArcSin[c*x]^2*(2*a + b*Sin[2*ArcSin[c*x]]) + 3*Sqrt[d + c*d*x]*S
qrt[e - c*e*x]*(4*a^2*c*x*Sqrt[1 - c^2*x^2] + 2*a*b*Cos[2*ArcSin[c*x]] - b^
2*Sin[2*ArcSin[c*x]]))/(24*c*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int \sqrt{cdx+d}\,\sqrt{-cex+e}\,(a+b\arcsin(cx))^2\,dx$$

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [F]

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int \sqrt{cdx+d}\sqrt{-cex+e}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e), x)
```

Sympy [F]

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$$
$$= \int \sqrt{d\,(cx+1)}\sqrt{-e\,(cx-1)}(a+b\,\mathrm{asin}\,(cx))^2\;dx$$

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)
[Out] Integral(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int \sqrt{cdx+d}\sqrt{-cex+e}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2),x)
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2), x)
```

3.579 $\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 432

$$\begin{aligned}
&\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x}\,dx \\
&= -2b^2\sqrt{d+cdx}\sqrt{e-cex} - \frac{2abcx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{2b^2cx\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{\sqrt{1-c^2x^2}} + \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad - \frac{2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{2ib\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{2ib\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{2b^2\sqrt{d+cdx}\sqrt{e-cex}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{2b^2\sqrt{d+cdx}\sqrt{e-cex}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] -2*b^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a
+b*arcsin(c*x))^2-2*a*b*c*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(
1/2)-2*b^2*c*x*arcsin(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1
/2)-2*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(c*d*x+d)^(1/2)
*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+2*I*b*(a+b*arcsin(c*x))*polylog(2,-I*c
*x-(-c^2*x^2+1)^(1/2))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-
2*I*b*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(c*d*x+d)^(1/2)
*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-2*b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1
```

```
/2))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+2*b^2*polylog(3,I*
c*x+(-c^2*x^2+1)^(1/2))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 432, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.257, Rules used = {4823, 4783, 4803, 4268, 2611, 2320, 6724, 4715, 267}

$$\begin{aligned}
&\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x}\,dx \\
&= -\frac{2\sqrt{cdx+d}\sqrt{e-cex}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} \\
&\quad+\frac{2ib\sqrt{cdx+d}\sqrt{e-cex}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} \\
&\quad-\frac{2ib\sqrt{cdx+d}\sqrt{e-cex}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} \\
&\quad+\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2-\frac{2abcx\sqrt{cdx+d}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} \\
&\quad-\frac{2b^2\sqrt{cdx+d}\sqrt{e-cex}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad+\frac{2b^2\sqrt{cdx+d}\sqrt{e-cex}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad-\frac{2b^2cx\arcsin(cx)\sqrt{cdx+d}\sqrt{e-cex}}{\sqrt{1-c^2x^2}}-2b^2\sqrt{cdx+d}\sqrt{e-cex}
\end{aligned}$$

```
[In] Int[(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] -2*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x] - (2*a*b*c*x*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x])/Sqrt[1 - c^2*x^2] - (2*b^2*c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Ar
cSin[c*x])/Sqrt[1 - c^2*x^2] + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSi
n[c*x])^2 - (2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2*ArcTan
h[E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + ((2*I)*b*Sqrt[d + c*d*x]*Sqrt[e -
 c*e*x]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^
2] - ((2*I)*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])*PolyLog[2
, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (2*b^2*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*PolyLog[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (2*b^2*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
```

```
NeQ[p, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
```

```
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{x}\,dx}{\sqrt{1-c^2x^2}} \\
&= \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2+\frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(2bc\sqrt{d+cdx}\sqrt{e-cex}\right)\int (a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{2abcx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}}+\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad +\frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\mathrm{Subst}\left(\int (a+bx)^2\csc(x)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} \\
&\quad -\frac{\left(2b^2c\sqrt{d+cdx}\sqrt{e-cex}\right)\int \arcsin(cx)\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{2abcx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{\sqrt{1-c^2x^2}} + \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 - \frac{2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2b\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}\left(\int(a+bx)\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{\left(2b\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}\left(\int(a+bx)\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{\left(2b^2c^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}$$

$$= -2b^2\sqrt{d+cdx}\sqrt{e-cex} - \frac{2abcx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{\sqrt{1-c^2x^2}} + \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 - \frac{2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2ib\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2ib\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2ib^2\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}\left(\int\text{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} + \frac{\left(2ib^2\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}\left(\int\text{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= -2b^2\sqrt{d+cdx}\sqrt{e-cex} - \frac{2abcx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{\sqrt{1-c^2x^2}} + \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 - \frac{2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2ib\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2ib\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2b^2\sqrt{d+cdx}\sqrt{e-cex}\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{\left(2b^2\sqrt{d+cdx}\sqrt{e-cex}\right)\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}(2,x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

$$= -2b^2\sqrt{d+cdx}\sqrt{e-cex} - \frac{2abcx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2b^2cx\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{\sqrt{1-c^2x^2}} + \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 - \frac{2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2ib\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2ib\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2b^2\sqrt{d+cdx}\sqrt{e-cex}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2b^2\sqrt{d+cdx}\sqrt{e-cex}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 2.25 (sec) , antiderivative size = 434, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x}\,dx$$
$$= a^2\sqrt{d+cdx}\sqrt{e-cex}+a^2\sqrt{d}\sqrt{e}\log(cx)-a^2\sqrt{d}\sqrt{e}\log\left(de+\sqrt{d}\sqrt{e}\sqrt{d+cdx}\sqrt{e-cex}\right)$$
$$-\frac{2ab\sqrt{d+cdx}\sqrt{e-cex}\left(cx-\sqrt{1-c^2x^2}\arcsin(cx)-\arcsin(cx)\log\left(1-e^{i\arcsin(cx)}\right)+\arcsin(cx)\log\left(1\right.\right.}{\sqrt{1-c^2x^2}}$$
$$-\frac{b^2\sqrt{d+cdx}\sqrt{e-cex}\left(2\sqrt{1-c^2x^2}+2cx\arcsin(cx)-\sqrt{1-c^2x^2}\arcsin(cx)^2-\arcsin(cx)^2\log\left(1-e^{i\,\mathrm{ar}}\right.\right.}{}$$

```
[In] Integrate[(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x] + a^2*Sqrt[d]*Sqrt[e]*Log[c*x] - a^2*Sq
rt[d]*Sqrt[e]*Log[d*e + Sqrt[d]*Sqrt[e]*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]] -
(2*a*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c*x]
 - ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]*Log[1 + E^(I*ArcSin
[c*x])] - I*PolyLog[2, -E^(I*ArcSin[c*x])] + I*PolyLog[2, E^(I*ArcSin[c*x])
]))/Sqrt[1 - c^2*x^2] - (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*Sqrt[1 - c^
2*x^2] + 2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 - ArcSin[c*x]^
2*Log[1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] - (
2*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] + (2*I)*ArcSin[c*x]*PolyLog
[2, E^(I*ArcSin[c*x])] + 2*PolyLog[3, -E^(I*ArcSin[c*x])] - 2*PolyLog[3, E^
(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2]
```

Maple [F]

$$\int \frac{\sqrt{cdx+d}\,\sqrt{-cex+e}\,(a+b\arcsin(cx))^2}{x}dx$$

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x)
```

Fricas [F]

$$\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x}\,dx=\int \frac{\sqrt{cdx+d}\sqrt{-cex+e}(b\arcsin(cx)+a)^2}{x}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/x, x)
```

Sympy [F]

$$\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x}\,dx$$
$$= \int \frac{\sqrt{d\,(cx+1)}\sqrt{-e\,(cx-1)}(a+b\,\mathrm{asin}\,(cx))^2}{x}\,dx$$

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2/x,x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2/x, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x}\,dx = \int \frac{\sqrt{cdx+d}\sqrt{-cex+e}(b\arcsin(cx)+a)^2}{x}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2))/x,x)
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2))/x, x)
```

3.580 $\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x^2}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 257

$$\begin{aligned}
\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x^2}\,dx
&= -\frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x} - \frac{ic\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{c\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} \\
&\quad + \frac{2bc\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{ib^2c\sqrt{d+cdx}\sqrt{e-cex}\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] -(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x-I*c*(a+b*arcsin(c*x
))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-1/3*c*(a+b*arcsin(
c*x))^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/b/(-c^2*x^2+1)^(1/2)+2*b*c*(a+b*ar
csin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1
/2)/(-c^2*x^2+1)^(1/2)-I*b^2*c*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(c*d
*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.229, Rules used = {4823, 4781, 4721, 3798, 2221, 2317, 2438, 4737}

$$\begin{aligned}
&\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x^2}\,dx \\
&= -\frac{c\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} - \frac{ic\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{2bc\sqrt{cdx+d}\sqrt{e-cex}\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x} \\
&\quad - \frac{ib^2c\sqrt{cdx+d}\sqrt{e-cex}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[In] Int[(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] -((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x) - (I*c*Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2] - (c*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(3*b*Sqrt[1 - c^2*x^2])
+ (2*b*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])*Log[1 - E^((2*
I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^2*c*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4781

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[b*c*(n/(f*(m + 1)))*Simp[Sqrt[d + e*x^
2]/Sqrt[1 - c^2*x^2]], Int[(f*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x
] + Dist[(c^2/(f^2*(m + 1)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(
f*x)^(m + 2)*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a
, b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[m, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{x^2}\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x} + \frac{\left(2bc\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{a+b\arcsin(cx)}{x}\,dx}{\sqrt{1-c^2x^2}} - \frac{\left(c^2\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x} - \frac{c\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} + \frac{\left(2bc\sqrt{d+cdx}\sqrt{e-cex}\right)\mathrm{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x} - \frac{ic\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{c\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} - \frac{\left(4ibc\sqrt{d+cdx}\sqrt{e-cex}\right)\mathrm{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x} - \frac{ic\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{c\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} + \frac{2bc\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{\left(2b^2c\sqrt{d+cdx}\sqrt{e-cex}\right)\mathrm{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x} - \frac{ic\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{c\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}} + \frac{2bc\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{\left(ib^2c\sqrt{d+cdx}\sqrt{e-cex}\right)\mathrm{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

$$= -\frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x} - \frac{ic\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}$$
$$- \frac{c\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{3b\sqrt{1-c^2x^2}}$$
$$+ \frac{2bc\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$- \frac{ib^2c\sqrt{d+cdx}\sqrt{e-cex}\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 1.35 (sec) , antiderivative size = 374, normalized size of antiderivative = 1.46

$$\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x^2}\,dx$$
$$= \frac{-3a^2\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2} - 3ib\sqrt{d+cdx}\sqrt{e-cex}\left(-iacx+bcx-ib\sqrt{1-c^2x^2}\right)\arcsin(cx)^2 - b^2}{}$$

```
[In] Integrate[(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/x^2,x]
```

```
[Out] (-3*a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2] - (3*I)*b*Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x]*((-I)*a*c*x + b*c*x - I*b*Sqrt[1 - c^2*x^2])*ArcSi
n[c*x]^2 - b^2*c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 + 3*a^2*c*
Sqrt[d]*Sqrt[e]*x*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*
x]*ArcSin[c*x]*(-(a*Sqrt[1 - c^2*x^2]) + b*c*x*Log[1 - E^((2*I)*ArcSin[c*x]
)]) + 6*a*b*c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Log[c*x] - (3*I)*b^2*c*x*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(3*x*Sqrt[
1 - c^2*x^2])
```

Maple [F]

$$\int \frac{\sqrt{cdx+d}\,\sqrt{-cex+e}\,(a+b\arcsin(cx))^2}{x^2}dx$$

```
[In] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x)
```

```
[Out] int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x)
```

Fricas [F]

$$\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x^2}\,dx = \int \frac{\sqrt{cdx+d}\sqrt{-cex+e}(b\arcsin(cx)+a)^2}{x^2}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/x^2, x)
```

Sympy [F]

$$\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x^2}\,dx = \int \frac{\sqrt{d(cx+1)}\sqrt{-e(cx-1)}(a+b\,\mathrm{asin}(cx))^2}{x^2}\,dx$$

```
[In] integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2/x**2,x)
```

```
[Out] Integral(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2/x**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x^2}\,dx = \int \frac{\sqrt{cdx+d}\sqrt{-cex+e}(b\arcsin(cx)+a)^2}{x^2}\,dx$$

```
[In] integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="giac")
```

```
[Out] integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/x^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}{x^2}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2))/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2))/x^2, x)
```

3.581 $\int x^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 35, antiderivative size = 509

$$\int x^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = -\frac{7b^2dex\sqrt{d+cdx}\sqrt{e-cex}}{1152c^2}-\frac{43b^2dex^3\sqrt{d+cdx}\sqrt{e-cex}}{1728}+\frac{1}{108}b^2c^2dex^5\sqrt{d+cdx}\sqrt{e-cex}+\frac{7b^2de\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{1152c^3\sqrt{1-c^2x^2}}+\frac{bdex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}}-\frac{7bcdex^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}}+\frac{bc^3dex^6\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}}-\frac{dex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{16c^2}+\frac{1}{8}dex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2+\frac{1}{6}dex^3\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}}$$

```
[Out] -7/1152*b^2*d*e*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^2-43/1728*b^2*d*e*x^3*
(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+1/108*b^2*c^2*d*e*x^5*(c*d*x+d)^(1/2)*(-c*
e*x+e)^(1/2)-1/16*d*e*x*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2
)/c^2+1/8*d*e*x^3*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+1/6*
d*e*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+7
/1152*b^2*d*e*arcsin(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^3/(-c^2*x^2+1)
^(1/2)+1/16*b*d*e*x^2*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c/
(-c^2*x^2+1)^(1/2)-7/48*b*c*d*e*x^4*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e
*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+1/18*b*c^3*d*e*x^6*(a+b*arcsin(c*x))*(c*d*x+
```

```
d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+1/48*d*e*(a+b*arcsin(c*x))^3*(
c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.70 (sec) , antiderivative size = 509, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.343$, Rules used = {4823, 4787, 4783, 4795, 4737, 4723, 327, 222, 14, 4777, 12, 470}

$$\begin{aligned}&\int x^2(d+cdx)^{3/2}(e\\&-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\frac{bdex^2\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}}\\&-\frac{7bcdex^4\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}}\\&+\frac{1}{6}dex^3\left(1-c^2x^2\right)\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2\\&-\frac{dex\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2}{16c^2}\\&+\frac{de\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}}\\&+\frac{bc^3dex^6\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}}\\&+\frac{1}{8}dex^3\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2\\&+\frac{7b^2de\arcsin(cx)\sqrt{cdx+d}\sqrt{e-cex}}{1152c^3\sqrt{1-c^2x^2}}+\frac{1}{108}b^2c^2dex^5\sqrt{cdx+d}\sqrt{e-cex}\\&-\frac{7b^2dex\sqrt{cdx+d}\sqrt{e-cex}}{1152c^2}-\frac{43b^2dex^3\sqrt{cdx+d}\sqrt{e-cex}}{1728}\end{aligned}$$

```
[In] Int[x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (-7*b^2*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(1152*c^2) - (43*b^2*d*e*x^3
*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/1728 + (b^2*c^2*d*e*x^5*Sqrt[d + c*d*x]*S
qrt[e - c*e*x])/108 + (7*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x
])/(1152*c^3*Sqrt[1 - c^2*x^2]) + (b*d*e*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*(a + b*ArcSin[c*x]))/(16*c*Sqrt[1 - c^2*x^2]) - (7*b*c*d*e*x^4*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(48*Sqrt[1 - c^2*x^2]) + (b*c^3*
d*e*x^6*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(18*Sqrt[1 - c
^2*x^2]) - (d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(1
6*c^2) + (d*e*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/8
+ (d*e*x^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x]
)^2)/6 + (d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^3)/(48*b*
c^3*Sqrt[1 - c^2*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4777

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist[
a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x
^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] &&
 IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
```

```
EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(de\sqrt{d+cdx}\sqrt{e-cex}\right)\int x^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} \\
&= \frac{1}{6}dex^3\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad+\frac{\left(de\sqrt{d+cdx}\sqrt{e-cex}\right)\int x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{2\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(bcde\sqrt{d+cdx}\sqrt{e-cex}\right)\int x^3\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{3\sqrt{1-c^2x^2}} \\
&= -\frac{bcdex^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{12\sqrt{1-c^2x^2}} \\
&\quad+\frac{bc^3dex^6\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} \\
&\quad+\frac{1}{8}dex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad+\frac{1}{6}dex^3\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad+\frac{\left(de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{8\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(bcde\sqrt{d+cdx}\sqrt{e-cex}\right)\int x^3(a+b\arcsin(cx))\,dx}{4\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(b^2c^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x^4\left(3-2c^2x^2\right)}{12\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{7bcdex^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} + \frac{bc^3dex^6\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} - \frac{dex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{16c^2} + \frac{1}{8}dex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{1}{6}dex^3\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{\left(de\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{16c^2\sqrt{1-c^2x^2}} + \frac{\left(bde\sqrt{d+cdx}\sqrt{e-cex}\right)\int x(a+b\arcsin(cx))\,dx}{8c\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x^4(3-2c^2x^2)}{\sqrt{1-c^2x^2}}dx}{36\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}dx}{16\sqrt{1-c^2x^2}}$$

$$= -\frac{1}{64}b^2dex^3\sqrt{d+cdx}\sqrt{e-cex} + \frac{1}{108}b^2c^2dex^5\sqrt{d+cdx}\sqrt{e-cex} + \frac{bdex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}} - \frac{7bcdex^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} + \frac{bc^3dex^6\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} - \frac{dex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{16c^2} + \frac{1}{8}dex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{1}{6}dex^3\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}} + \frac{\left(3b^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}dx}{64\sqrt{1-c^2x^2}} - \frac{\left(b^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}dx}{16\sqrt{1-c^2x^2}} + \frac{\left(b^2c^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}dx}{27\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{b^2dex\sqrt{d+cdx}\sqrt{e-cex}}{128c^2} - \frac{43b^2dex^3\sqrt{d+cdx}\sqrt{e-cex}}{1728} \\
&+ \frac{1}{108}b^2c^2dex^5\sqrt{d+cdx}\sqrt{e-cex} + \frac{bdex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}} \\
&- \frac{7bcdex^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} \\
&+ \frac{bc^3dex^6\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} \\
&- \frac{dex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{16c^2} \\
&+ \frac{1}{8}dex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+ \frac{1}{6}dex^3\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&+ \frac{de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}} \\
&+ \frac{\left(b^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{36\sqrt{1-c^2x^2}} \\
&+ \frac{\left(3b^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{128c^2\sqrt{1-c^2x^2}} \\
&- \frac{\left(b^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{32c^2\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{7b^2dex\sqrt{d+cdx}\sqrt{e-cex}}{1152c^2} - \frac{43b^2dex^3\sqrt{d+cdx}\sqrt{e-cex}}{1728} + \frac{1}{108}b^2c^2dex^5\sqrt{d+cdx}\sqrt{e-cex} - \frac{b^2de\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{128c^3\sqrt{1-c^2x^2}} + \frac{bdex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}} - \frac{7bcdex^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} + \frac{bc^3dex^6\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} - \frac{dex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{16c^2} + \frac{1}{8}dex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{1}{6}dex^3\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}} + \frac{\left(b^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{72c^2\sqrt{1-c^2x^2}}$$

$$= -\frac{7b^2dex\sqrt{d+cdx}\sqrt{e-cex}}{1152c^2} - \frac{43b^2dex^3\sqrt{d+cdx}\sqrt{e-cex}}{1728} + \frac{1}{108}b^2c^2dex^5\sqrt{d+cdx}\sqrt{e-cex} + \frac{7b^2de\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{1152c^3\sqrt{1-c^2x^2}} + \frac{bdex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}} - \frac{7bcdex^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} + \frac{bc^3dex^6\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} - \frac{dex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{16c^2} + \frac{1}{8}dex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{1}{6}dex^3\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 + \frac{de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 2.26 (sec) , antiderivative size = 452, normalized size of antiderivative = 0.89

$$\int x^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{288b^2de\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3-864a^2d^{3/2}e^{3/2}\sqrt{1-c^2x^2}\arctan\left(\right.}{}$$

```
[In] Integrate[x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (288*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 864*a^2*d^(3/2
)*e^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(S
qrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 12*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*
ArcSin[c*x]*(-18*b*Cos[2*ArcSin[c*x]] + 9*b*Cos[4*ArcSin[c*x]] + 2*b*Cos[6*
ArcSin[c*x]] - 36*a*Sin[2*ArcSin[c*x]] + 36*a*Sin[4*ArcSin[c*x]] + 12*a*Sin
[6*ArcSin[c*x]]) - 72*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(
-12*a - 3*b*Sin[2*ArcSin[c*x]] + 3*b*Sin[4*ArcSin[c*x]] + b*Sin[6*ArcSin[c*
x]]) + d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-864*a^2*c*x*Sqrt[1 - c^2*x^2]
+ 4032*a^2*c^3*x^3*Sqrt[1 - c^2*x^2] - 2304*a^2*c^5*x^5*Sqrt[1 - c^2*x^2] +
 216*a*b*Cos[2*ArcSin[c*x]] - 108*a*b*Cos[4*ArcSin[c*x]] - 24*a*b*Cos[6*Arc
Sin[c*x]] - 108*b^2*Sin[2*ArcSin[c*x]] + 27*b^2*Sin[4*ArcSin[c*x]] + 4*b^2*
Sin[6*ArcSin[c*x]]))/(13824*c^3*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int x^2(cdx+d)^{\frac{3}{2}}\,(-cex+e)^{\frac{3}{2}}\,(a+b\arcsin\,(cx))^2\,dx$$

```
[In] int(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [F]

$$\int x^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin\,(cx)+a)^2x^2\,dx$$

```
[In] integrate(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="fricas")
```

```
[Out] integral(-(a^2*c^2*d*e*x^4 - a^2*d*e*x^2 + (b^2*c^2*d*e*x^4 - b^2*d*e*x^2)*
arcsin(c*x)^2 + 2*(a*b*c^2*d*e*x^4 - a*b*d*e*x^2)*arcsin(c*x))*sqrt(c*d*x +
 d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)]

Timed out.

$$\int x^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

```
[In] integrate(x**2*(c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int x^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int x^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2x^2\,dx$$

```
[In] integrate(x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algor
ithm="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2*x^2, x
)
```

Mupad [F(-1)]

Timed out.

$$\int x^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\int x^2\,(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}\,dx$$

```
[In] int(x^2*(a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2),x)
[Out] int(x^2*(a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2), x)
```

3.582 $\int x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 33, antiderivative size = 338

$$\begin{aligned}\int x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx &= \frac{16b^2de\sqrt{d+cdx}\sqrt{e-cex}}{75c^2}\\
&+\frac{8b^2de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{225c^2}+\frac{2b^2de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^2}{125c^2}\\
&+\frac{2bdex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}\\
&-\frac{4bcdex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}}\\
&+\frac{2bc^3dex^5\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}\\
&-\frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{5c^2}\end{aligned}$$

```
[Out] 16/75*b^2*d*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^2+8/225*b^2*d*e*(-c^2*x^2+
1)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^2+2/125*b^2*d*e*(-c^2*x^2+1)^2*(c*d*x
+d)^(1/2)*(-c*e*x+e)^(1/2)/c^2-1/5*d*e*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2*(
c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c^2+2/5*b*d*e*x*(a+b*arcsin(c*x))*(c*d*x+d)
^(1/2)*(-c*e*x+e)^(1/2)/c/(-c^2*x^2+1)^(1/2)-4/15*b*c*d*e*x^3*(a+b*arcsin(c
*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+2/25*b*c^3*d*e*x^5
*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 338, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.212, Rules used = {4823, 4767, 200, 4739, 12, 1261, 712}

$$\int x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\frac{2bdex\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}-\frac{de(1-c^2x^2)^2\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2}{5c^2}-\frac{4bcdex^3\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}}+\frac{2bc^3dex^5\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}+\frac{2b^2de(1-c^2x^2)^2\sqrt{cdx+d}\sqrt{e-cex}}{125c^2}+\frac{8b^2de(1-c^2x^2)\sqrt{cdx+d}\sqrt{e-cex}}{225c^2}+\frac{16b^2de\sqrt{cdx+d}\sqrt{e-cex}}{75c^2}$$

```
[In] Int[x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (16*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(75*c^2) + (8*b^2*d*e*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2))/(225*c^2) + (2*b^2*d*e*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)^2)/(125*c^2) + (2*b*d*e*x*Sqrt[d + c*d*x]*
Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(5*c*Sqrt[1 - c^2*x^2]) - (4*b*c*d*e*x
^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(15*Sqrt[1 - c^2*x^
2]) + (2*b*c^3*d*e*x^5*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))
/(25*Sqrt[1 - c^2*x^2]) - (d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2
)^2*(a + b*ArcSin[c*x])^2)/(5*c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
```

```
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\text{integral} = \frac{\left(de\sqrt{d+cdx}\sqrt{e-cex}\right)\int x(1-c^2x^2)^{3/2}\left(a+b\arcsin(cx)\right)^2dx}{\sqrt{1-c^2x^2}}$$

$$= -\frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^2\left(a+b\arcsin(cx)\right)^2}{5c^2} + \frac{\left(2bde\sqrt{d+cdx}\sqrt{e-cex}\right)\int\left(1-c^2x^2\right)^2\left(a+b\arcsin(cx)\right)dx}{5c\sqrt{1-c^2x^2}}$$

$$=\frac{2bdex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}-\frac{4bcdex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}}+\frac{2bc^3dex^5\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}-\frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{5c^2}-\frac{\left(2b^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x(15-10c^2x^2+3c^4x^4)}{15\sqrt{1-c^2x^2}}dx}{5\sqrt{1-c^2x^2}}$$

$$=\frac{2bdex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}-\frac{4bcdex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}}+\frac{2bc^3dex^5\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}-\frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{5c^2}-\frac{\left(2b^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x(15-10c^2x^2+3c^4x^4)}{\sqrt{1-c^2x^2}}dx}{75\sqrt{1-c^2x^2}}$$

$$=\frac{2bdex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}-\frac{4bcdex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}}+\frac{2bc^3dex^5\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}-\frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{5c^2}-\frac{\left(b^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}\left(\int\frac{15-10c^2x+3c^4x^2}{\sqrt{1-c^2x}}dx,x,x^2\right)}{75\sqrt{1-c^2x^2}}$$

$$= \frac{2bdex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} - \frac{4bcdex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{2bc^3dex^5\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} - \frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{5c^2} - \frac{\left(b^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}\left(\int\left(\frac{8}{\sqrt{1-c^2x}}+4\sqrt{1-c^2x}+3(1-c^2x)^{3/2}\right)dx,x,x^2\right)}{75\sqrt{1-c^2x^2}}$$

$$= \frac{16b^2de\sqrt{d+cdx}\sqrt{e-cex}}{75c^2} + \frac{8b^2de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{225c^2} + \frac{2b^2de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^2}{125c^2} + \frac{2bdex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} - \frac{4bcdex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{2bc^3dex^5\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} - \frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^2(a+b\arcsin(cx))^2}{5c^2}$$

Mathematica [A] (verified)

Time = 2.30 (sec) , antiderivative size = 207, normalized size of antiderivative = 0.61

$$\int x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx =$$

$$-\frac{de\sqrt{d+cdx}\sqrt{e-cex}\Big(225a^2(-1+c^2x^2)^3+30abcx\sqrt{1-c^2x^2}(15-10c^2x^2+3c^4x^4)+2b^2(149-187c^2x^2\ \cdots}{}$$

```
[In] Integrate[x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/1125*(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(225*a^2*(-1 + c^2*x^2)^3 + 30
*a*b*c*x*Sqrt[1 - c^2*x^2]*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 2*b^2*(149 - 187
*c^2*x^2 + 47*c^4*x^4 - 9*c^6*x^6) + 30*b*(15*a*(-1 + c^2*x^2)^3 + b*c*x*Sq
rt[1 - c^2*x^2]*(15 - 10*c^2*x^2 + 3*c^4*x^4))*ArcSin[c*x] + 225*b^2*(-1 +
c^2*x^2)^3*ArcSin[c*x]^2))/(c^2*(-1 + c^2*x^2))
```

Maple [F]

$$\int x(cdx+d)^{\frac{3}{2}}\,(-cex+e)^{\frac{3}{2}}\,(a+b\arcsin\,(cx))^2\,dx$$

[In] int(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)

[Out] int(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 302, normalized size of antiderivative = 0.89

$$\int x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx =$$
$$-\frac{(9\,(25\,a^2-2\,b^2)c^6dex^6-(675\,a^2-94\,b^2)c^4dex^4+(675\,a^2-374\,b^2)c^2dex^2-(225\,a^2-298\,b^2)de+225\,(b^2$$

[In] integrate(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")

[Out] -1/1125*(9*(25*a^2 - 2*b^2)*c^6*d*e*x^6 - (675*a^2 - 94*b^2)*c^4*d*e*x^4 + (675*a^2 - 374*b^2)*c^2*d*e*x^2 - (225*a^2 - 298*b^2)*d*e + 225*(b^2*c^6*d*e*x^6 - 3*b^2*c^4*d*e*x^4 + 3*b^2*c^2*d*e*x^2 - b^2*d*e)*arcsin(c*x)^2 + 450*(a*b*c^6*d*e*x^6 - 3*a*b*c^4*d*e*x^4 + 3*a*b*c^2*d*e*x^2 - a*b*d*e)*arcsin(c*x) + 30*(3*a*b*c^5*d*e*x^5 - 10*a*b*c^3*d*e*x^3 + 15*a*b*c*d*e*x + (3*b^2*c^5*d*e*x^5 - 10*b^2*c^3*d*e*x^3 + 15*b^2*c*d*e*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^4*x^2 - c^2)

Sympy [F(-1)]

Timed out.

$$\int x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

[In] integrate(x*(c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)

[Out] Timed out

Maxima [F(-2)]

Exception generated.

$$\int x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2x\,dx$$

```
[In] integrate(x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorit
hm="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2*x, x)
```

Mupad [F(-1)]

Timed out.

$$\int x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int x\,(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}\,dx$$

```
[In] int(x*(a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2),x)
```

```
[Out] int(x*(a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2), x)
```

3.583 $\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 362

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx =$$

$$-\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2}-\frac{15b^2x(d+cdx)^{3/2}(e-cex)^{3/2}}{64\,(1-c^2x^2)}+\frac{9b^2(d+cdx)^{3/2}(e-cex)^{3/2}\arcsin(cx)}{64c\,(1-c^2x^2)^{3/2}}-3$$

```
[Out] -1/32*b^2*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)-15/64*b^2*x*(c*d*x+d)^(3/2)*(-
c*e*x+e)^(3/2)/(-c^2*x^2+1)+9/64*b^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*arcsi
n(c*x)/c/(-c^2*x^2+1)^(3/2)-3/8*b*c*x^2*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a
+b*arcsin(c*x))/(-c^2*x^2+1)^(3/2)+1/4*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(
a+b*arcsin(c*x))^2+3/8*x*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))
^2/(-c^2*x^2+1)+1/8*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^3/b/
c/(-c^2*x^2+1)^(3/2)+1/8*b*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x
))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 362, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.281, Rules used = {4763, 4743, 4741, 4737, 4723, 327, 222, 4767, 201}

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\frac{(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^3}{8bc\,(1-c^2x^2)^{3/2}}$$
$$+\frac{3x(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8\,(1-c^2x^2)}$$
$$+\frac{b\sqrt{1-c^2x^2}(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8c}$$
$$-\frac{3bcx^2(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8\,(1-c^2x^2)^{3/2}}$$
$$+\frac{1}{4}x(cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2+\frac{9b^2\arcsin(cx)(cdx+d)^{3/2}(e-cex)^{3/2}}{64c\,(1-c^2x^2)^{3/2}}-\frac{15b^2x(cdx+d)^{3/2}(e-}{64\,(1-c^2x^2)}$$

```
[In] Int[(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/32*(b^2*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (15*b^2*x*(d + c*d*x)^(
3/2)*(e - c*e*x)^(3/2))/(64*(1 - c^2*x^2)) + (9*b^2*(d + c*d*x)^(3/2)*(e -
c*e*x)^(3/2)*ArcSin[c*x])/(64*c*(1 - c^2*x^2)^(3/2)) - (3*b*c*x^2*(d + c*d*
x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x]))/(8*(1 - c^2*x^2)^(3/2)) + (
b*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/(8*c) + (x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/4 +
 (3*x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(8*(1 - c^
2*x^2)) + ((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^3)/(8*b*
c*(1 - c^2*x^2)^(3/2))
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
```

```
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4743

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (D
ist[2*d*(p/(2*p + 1)), Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x
] - Dist[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[x*(1 -
c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c,
d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\text{integral} = \frac{\left((d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{1}{4}x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{\left(3(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{4\left(1-c^2x^2\right)^{3/2}} - \frac{\left(bc(d+cdx)^{3/2}(e-cex)^{3/2}\right)\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{2\left(1-c^2x^2\right)^{3/2}}$$

$$= \frac{b(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{1}{4}x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{3x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8\left(1-c^2x^2\right)} + \frac{(3(}{}$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{3bcx^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8\left(1-c^2x^2\right)^{3/2}} + \frac{b(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{1}{4}x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{3x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8\left(1-c^2x^2\right)} + \frac{(d}{}$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2x(d+cdx)^{3/2}(e-cex)^{3/2}}{64\left(1-c^2x^2\right)} - \frac{3bcx^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8\left(1-c^2x^2\right)^{3/2}} + \frac{b(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{1}{4}x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{3x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8\left(1-c^2x^2\right)} + \frac{(d}{}$$

$$= -\frac{1}{32}b^2x(d+cdx)^{3/2}(e-cex)^{3/2} - \frac{15b^2x(d+cdx)^{3/2}(e-cex)^{3/2}}{64(1-c^2x^2)} + \frac{9b^2(d+cdx)^{3/2}(e-cex)^{3/2}\arcsin(cx)}{64c(1-c^2x^2)^{3/2}} - \frac{3bcx^2(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))}{8(1-c^2x^2)^{3/2}} + \frac{b(d+cdx)^{3/2}(e-cex)^{3/2}\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{1}{4}x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2 + \frac{3x(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{8(1-c^2x^2)} + \frac{(}{}$$

Mathematica [A] (verified)

Time = 0.92 (sec) , antiderivative size = 373, normalized size of antiderivative = 1.03

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{32b^2de\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 96a^2d^{3/2}e^{3/2}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{}}{\sqrt{d}}\right.}{}$$

```
[In] Integrate[(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (32*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 96*a^2*d^(3/2)*
e^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqr
t[d]*Sqrt[e]*(-1 + c^2*x^2))] + 8*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Arc
Sin[c*x]^2*(12*a + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSin[c*x]]) + d*e*Sqr
t[d + c*d*x]*Sqrt[e - c*e*x]*(160*a^2*c*x*Sqrt[1 - c^2*x^2] - 64*a^2*c^3*x^
3*Sqrt[1 - c^2*x^2] + 64*a*b*Cos[2*ArcSin[c*x]] + 4*a*b*Cos[4*ArcSin[c*x]]
- 32*b^2*Sin[2*ArcSin[c*x]] - b^2*Sin[4*ArcSin[c*x]]) + 4*b*d*e*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(16*b*Cos[2*ArcSin[c*x]] + b*Cos[4*ArcSin[
c*x]] + 4*a*(8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/(256*c*Sqrt[1 - c
^2*x^2])
```

Maple [F]

$$\int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(a+b\arcsin(cx))^2\,dx$$

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

```
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [F]

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin{(cx)}+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="fricas")
```

```
[Out] integral(-(a^2*c^2*d*e*x^2 - a^2*d*e + (b^2*c^2*d*e*x^2 - b^2*d*e)*arcsin(c
*x)^2 + 2*(a*b*c^2*d*e*x^2 - a*b*d*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*
e*x + e), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\text{Timed out}$$

```
[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

```
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm
="giac")
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2),x)
[Out] int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2), x)
```

3.584 $\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 647

$$
\begin{aligned}
&\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx = \\
&-\frac{22}{9}b^2de\sqrt{d+cdx}\sqrt{e-cex}-\frac{2abcdex\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} \\
&-\frac{2}{27}b^2de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2) \\
&-\frac{2b^2cdex\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{\sqrt{1-c^2x^2}} \\
&-\frac{2bcdex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&+\frac{2bc^3dex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&+de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+\frac{1}{3}de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2 \\
&-\frac{2de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&+\frac{2ibde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&-\frac{2ibde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&-\frac{2b^2de\sqrt{d+cdx}\sqrt{e-cex}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&+\frac{2b^2de\sqrt{d+cdx}\sqrt{e-cex}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

```
[Out] -22/9*b^2*d*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)-2/27*b^2*d*e*(-c^2*x^2+1)*(c
*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)+d*e*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*
e*x+e)^(1/2)+1/3*d*e*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(c*d*x+d)^(1/2)*(-c*e
*x+e)^(1/2)-2*a*b*c*d*e*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/
2)-2*b^2*c*d*e*x*arcsin(c*x)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^
(1/2)-2/3*b*c*d*e*x*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^
2*x^2+1)^(1/2)+2/9*b*c^3*d*e*x^3*(a+b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+
e)^(1/2)/(-c^2*x^2+1)^(1/2)-2*d*e*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x
^2+1)^(1/2))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+2*I*b*d*e*
(a+b*arcsin(c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(c*d*x+d)^(1/2)*(-c*
e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-2*I*b*d*e*(a+b*arcsin(c*x))*polylog(2,I*c*x
+(-c^2*x^2+1)^(1/2))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-2*
b^2*d*e*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/
2)/(-c^2*x^2+1)^(1/2)+2*b^2*d*e*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))*(c*d*x+
d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.65 (sec) , antiderivative size = 647, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.371$, Rules

used = {4823, 4787, 4783, 4803, 4268, 2611, 2320, 6724, 4715, 267, 4739, 455, 45}

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx = -\frac{2de\sqrt{cdx+d}\sqrt{e-cex}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} + \frac{2ibde\sqrt{cdx+d}\sqrt{e-cex}\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} - \frac{2ibde\sqrt{cdx+d}\sqrt{e-cex}\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} - \frac{2bcdex\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} + \frac{1}{3}de(1-c^2x^2)\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{2bc^3dex^3\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + de\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2 - \frac{2abcdex\sqrt{cdx+d}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2b^2de\sqrt{cdx+d}\sqrt{e-cex}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} + \frac{2b^2de\sqrt{cdx+d}\sqrt{e-cex}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{2b^2cdex\arcsin(cx)\sqrt{cdx+d}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} - \frac{2}{27}b^2de(1-c^2x^2)\sqrt{cdx+d}\sqrt{e-cex} - \frac{22}{9}b^2de\sqrt{cdx+d}\sqrt{e-cex}$$

```
[In] Int[((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] (-22*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/9 - (2*a*b*c*d*e*x*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x])/Sqrt[1 - c^2*x^2] - (2*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[
e - c*e*x]*(1 - c^2*x^2))/27 - (2*b^2*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*
x]*ArcSin[c*x])/Sqrt[1 - c^2*x^2] - (2*b*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) + (2*b*c^3*d*e*x^3*Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + d*e*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2 + (d*e*Sqrt[d + c*d*x]
*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/3 - (2*d*e*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/Sqr
t[1 - c^2*x^2] + ((2*I)*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin
[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - ((2*I)*b*d*e*Sqr
t[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x
])])/Sqrt[1 - c^2*x^2] - (2*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*PolyLog
```

```
[3, -E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] + (2*b^2*d*e*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]*PolyLog[3, E^(I*ArcSin[c*x])])/Sqrt[1 - c^2*x^2]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4739

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4783

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*Sqrt[(d_) +
(e_.)*(x_)^2], x_Symbol] :> Simp[(f*x)^(m + 1)*Sqrt[d + e*x^2]*((a + b*ArcS
in[c*x])^n/(f*(m + 2))), x] + (Dist[(1/(m + 2))*Simp[Sqrt[d + e*x^2]/Sqrt[1
 - c^2*x^2]], Int[(f*x)^m*((a + b*ArcSin[c*x])^n/Sqrt[1 - c^2*x^2]), x], x]
 - Dist[b*c*(n/(f*(m + 2)))*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(f
*x)^(m + 1)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f
, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && (IGtQ[m, -2] || EqQ[n, 1])
```

Rule 4787

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 2*p + 1))), x] + (Dist[2*d*(p/(m + 2*p + 1)), Int[(f*x)^
m*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m + 2
*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x
^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e,
 f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] &&  !LtQ[m, -1]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
```

```
x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx}{\sqrt{1-c^2x^2}}\\
&= \frac{1}{3}de\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2\\
&\quad+\frac{\left(de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{x}\,dx}{\sqrt{1-c^2x^2}}\\
&\quad-\frac{\left(2bcde\sqrt{d+cdx}\sqrt{e-cex}\right)\int \left(1-c^2x^2\right)(a+b\arcsin(cx))\,dx}{3\sqrt{1-c^2x^2}}\\
&= -\frac{2bcdex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}\\
&\quad+\frac{2bc^3dex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}\\
&\quad+de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\\
&\quad+\frac{1}{3}de\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2\\
&\quad+\frac{\left(de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}\\
&\quad-\frac{\left(2bcde\sqrt{d+cdx}\sqrt{e-cex}\right)\int (a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}\\
&\quad+\frac{\left(2b^2c^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{x\left(1-\frac{c^2x^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx}{3\sqrt{1-c^2x^2}}
\end{aligned}$$

$$=-\frac{2abcdex\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}}-\frac{2bcdex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}$$
$$+\frac{2bc^3dex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}$$
$$+de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2$$
$$+\frac{1}{3}de\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2$$
$$+\frac{\left(de\sqrt{d+cdx}\sqrt{e-cex}\right)\mathrm{Subst}\left(\int(a+bx)^2\csc(x)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$
$$-\frac{\left(2b^2cde\sqrt{d+cdx}\sqrt{e-cex}\right)\int\arcsin(cx)\,dx}{\sqrt{1-c^2x^2}}$$
$$+\frac{\left(b^2c^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\mathrm{Subst}\left(\int\frac{1-\frac{c^2x}{3}}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{3\sqrt{1-c^2x^2}}$$

$$=-\frac{2abcdex\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}}-\frac{2b^2cdex\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{\sqrt{1-c^2x^2}}$$
$$-\frac{2bcdex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}$$
$$+\frac{2bc^3dex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}$$
$$+de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2$$
$$+\frac{1}{3}de\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2$$
$$-\frac{2de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$-\frac{\left(2bde\sqrt{d+cdx}\sqrt{e-cex}\right)\mathrm{Subst}\left(\int(a+bx)\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$
$$+\frac{\left(2bde\sqrt{d+cdx}\sqrt{e-cex}\right)\mathrm{Subst}\left(\int(a+bx)\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$
$$+\frac{\left(b^2c^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\mathrm{Subst}\left(\int\left(\frac{2}{3\sqrt{1-c^2x}}+\frac{1}{3}\sqrt{1-c^2x}\right)\,dx,x,x^2\right)}{3\sqrt{1-c^2x^2}}$$
$$+\frac{\left(2b^2c^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= -\frac{22}{9}b^2de\sqrt{d+cdx}\sqrt{e-cex} - \frac{2abcdex\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{2}{27}b^2de\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right) - \frac{2b^2cdex\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{2bcdex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&\quad + \frac{2bc^3dex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&\quad + de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{3}de\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad - \frac{2de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{2ibde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{2ibde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2ib^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\operatorname{Subst}\left(\int \operatorname{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2ib^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\operatorname{Subst}\left(\int \operatorname{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{22}{9} b^2 de\sqrt{d+cdx}\sqrt{e-cex} - \frac{2abcdex\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{2}{27} b^2 de\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right) - \frac{2b^2cdex\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{2bcdex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&\quad + \frac{2bc^3dex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&\quad + de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{3} de\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2 \\
&\quad - \frac{2de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{2ibde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{2ibde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad - \frac{\left(2b^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&\quad + \frac{\left(2b^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\operatorname{Subst}\left(\int \frac{\operatorname{PolyLog}(2,x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= -\frac{22}{9}b^2de\sqrt{d+cdx}\sqrt{e-cex} - \frac{2abcdex\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{1-c^2x^2}}$$
$$-\frac{2}{27}b^2de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2) - \frac{2b^2cdex\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{\sqrt{1-c^2x^2}}$$
$$-\frac{2bcdex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}$$
$$+\frac{2bc^3dex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}$$
$$+de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2$$
$$+\frac{1}{3}de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2$$
$$-\frac{2de\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$+\frac{2ibde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$-\frac{2ibde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$-\frac{2b^2de\sqrt{d+cdx}\sqrt{e-cex}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$
$$+\frac{2b^2de\sqrt{d+cdx}\sqrt{e-cex}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 5.08 (sec) , antiderivative size = 632, normalized size of antiderivative = 0.98

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx = -\frac{1}{3}a^2de\sqrt{d+cdx}\sqrt{e-cex}\left(-4+c^2x^2\right)$$
$$+\frac{2abde\sqrt{d+cdx}\sqrt{e-cex}\left(-3cx+c^3x^3+3(1-c^2x^2)^{3/2}\arcsin(cx)\right)}{9\sqrt{1-c^2x^2}}$$
$$+a^2d^{3/2}e^{3/2}\log(cx)-a^2d^{3/2}e^{3/2}\log\left(de+\sqrt{d}\sqrt{e}\sqrt{d+cdx}\sqrt{e-cex}\right)-\frac{2abde\sqrt{d+cdx}\sqrt{e-cex}(cx-\sqrt{1-}}{}$$

```
[In] Integrate[((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/x,x]
```

```
[Out] -1/3*(a^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-4 + c^2*x^2)) + (2*a*b*d*e*
Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-3*c*x + c^3*x^3 + 3*(1 - c^2*x^2)^(3/2)*A
rcSin[c*x]))/(9*Sqrt[1 - c^2*x^2]) + a^2*d^(3/2)*e^(3/2)*Log[c*x] - a^2*d^(
3/2)*e^(3/2)*Log[d*e + Sqrt[d]*Sqrt[e]*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]] - (
2*a*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(c*x - Sqrt[1 - c^2*x^2]*ArcSin[c
*x] - ArcSin[c*x]*Log[1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]*Log[1 + E^(I*Arc
```

```
Sin[c*x])] - I*PolyLog[2, -E^(I*ArcSin[c*x])] + I*PolyLog[2, E^(I*ArcSin[c*
x])]))/Sqrt[1 - c^2*x^2] - (b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*Sqrt
[1 - c^2*x^2] + 2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 - ArcSi
n[c*x]^2*Log[1 - E^(I*ArcSin[c*x])] + ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x
])] - (2*I)*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] + (2*I)*ArcSin[c*x]*
PolyLog[2, E^(I*ArcSin[c*x])] + 2*PolyLog[3, -E^(I*ArcSin[c*x])] - 2*PolyLo
g[3, E^(I*ArcSin[c*x])]))/Sqrt[1 - c^2*x^2] + (b^2*d*e*Sqrt[d + c*d*x]*Sqrt
[e - c*e*x]*(27*Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x]^2) + (-2 + 9*ArcSin[c*x
]^2)*Cos[3*ArcSin[c*x]] - 6*ArcSin[c*x]*(9*c*x + Sin[3*ArcSin[c*x]])))/(108
*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int \frac{(cdx+d)^{\frac{3}{2}} (-cex+e)^{\frac{3}{2}} (a+b\arcsin{(cx)})^2}{x} dx$$

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x)
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x)
```

Fricas [F]

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x} dx = \int \frac{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin{(cx)}+a)^2}{x} dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="fricas")
[Out] integral(-(a^2*c^2*d*e*x^2 - a^2*d*e + (b^2*c^2*d*e*x^2 - b^2*d*e)*arcsin(c
*x)^2 + 2*(a*b*c^2*d*e*x^2 - a*b*d*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*
e*x + e)/x, x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x} dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/x,x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{x}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x,x, algorit
hm="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/x, x)
```

3.585 $\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 505

$$\begin{aligned}
\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx &= \frac{1}{4}b^2c^2dex\sqrt{d+cdx}\sqrt{e-cex} \\
&- \frac{5b^2cde\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4\sqrt{1-c^2x^2}} \\
&+ \frac{3bc^3dex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&+ bcde\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&- \frac{3}{2}c^2dex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&- \frac{icde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} \\
&- \frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{x} \\
&- \frac{cde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{2b\sqrt{1-c^2x^2}} \\
&+ \frac{2bcde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{ib^2cde\sqrt{d+cdx}\sqrt{e-cex}\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}$$

```
[Out] 1/4*b^2*c^2*d*e*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)-3/2*c^2*d*e*x*(a+b*arcsi
n(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)-d*e*(-c^2*x^2+1)*(a+b*arcsin(c*x
))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/x-5/4*b^2*c*d*e*arcsin(c*x)*(c*d*x+d)
^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+3/2*b*c^3*d*e*x^2*(a+b*arcsin(c*
x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-I*c*d*e*(a+b*arcsin
```

```
(c*x))^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-1/2*c*d*e*(a+b
*arcsin(c*x))^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/b/(-c^2*x^2+1)^(1/2)+2*b*c
*d*e*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(c*d*x+d)^(1/2)*(
-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b^2*c*d*e*polylog(2,(I*c*x+(-c^2*x^2+1
)^(1/2))^2)*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+b*c*d*e*(a+
b*arcsin(c*x))*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)^(1/2)
```

Rubi [A] (verified)

Time = 0.54 (sec) , antiderivative size = 505, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4823, 4785, 4741, 4737, 4723, 327, 222, 4773, 4721, 3798, 2221, 2317, 2438, 201}

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x^2}dx = -\frac{cde\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^3}{2b\sqrt{1-c^2x^2}} - \frac{icde\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} + bcde\sqrt{1-c^2x^2}\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx)) - \frac{de(1-c^2x^2)\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2}{x} + \frac{2bcde\sqrt{cdx+d}\sqrt{e-cex}\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}} - \frac{3}{2}c^2dex\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{3bc^3dex^2\sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{ib^2cde\sqrt{cdx+d}\sqrt{e-cex}\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{5b^2cde\arcsin(cx)\sqrt{cdx+d}\sqrt{e-cex}}{4\sqrt{1-c^2x^2}} + \frac{1}{4}b^2c^2dex\sqrt{cdx+d}\sqrt{e-cex}$$

```
[In] Int[((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/x^2,x]

[Out] (b^2*c^2*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/4 - (5*b^2*c*d*e*Sqrt[d + c
*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x])/(4*Sqrt[1 - c^2*x^2]) + (3*b*c^3*d*e*x^2
*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x]))/(2*Sqrt[1 - c^2*x^2])
 + b*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[
c*x]) - (3*c^2*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)
/2 - (I*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/Sqrt[1
 - c^2*x^2] - (d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1 - c^2*x^2)*(a + b*Arc
Sin[c*x])^2)/x - (c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])
```

```
^3)/(2*b*Sqrt[1 - c^2*x^2]) + (2*b*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a
 + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/Sqrt[1 - c^2*x^2] - (I*b^
2*c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/
Sqrt[1 - c^2*x^2]
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4741

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Dist[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]], Int[(a + b*ArcSin[c*x])^n/Sqrt[1
 - c^2*x^2], x], x] - Dist[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]
], Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x]
&& EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

Rule 4773

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.))/(x_),
x_Symbol] :> Simp[(d + e*x^2)^p*((a + b*ArcSin[c*x])/(2*p)), x] + (Dist[d,
Int[(d + e*x^2)^(p - 1)*((a + b*ArcSin[c*x])/x), x], x] - Dist[b*c*(d^p/(2*
p)), Int[(1 - c^2*x^2)^(p - 1/2), x], x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 4785

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^p*((a + b*ArcS
in[c*x])^n/(f*(m + 1))), x] + (-Dist[2*e*(p/(f^2*(m + 1))), Int[(f*x)^(m +
```

```
2)*(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c*(n/(f*(m +
1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(
p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e, f},
x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\left(de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx}{\sqrt{1-c^2x^2}} \\
&= -\frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{x} \\
&\quad+\frac{\left(2bcde\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{(1-c^2x^2)(a+b\arcsin(cx))}{x}\,dx}{\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(3c^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\,dx}{\sqrt{1-c^2x^2}} \\
&= bcde\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&\quad-\frac{3}{2}c^2dex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&\quad-\frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{x} \\
&\quad+\frac{\left(2bcde\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{a+b\arcsin(cx)}{x}\,dx}{\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(3c^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(b^2c^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int \sqrt{1-c^2x^2}\,dx}{\sqrt{1-c^2x^2}} \\
&\quad+\frac{\left(3bc^3de\sqrt{d+cdx}\sqrt{e-cex}\right)\int x(a+b\arcsin(cx))\,dx}{\sqrt{1-c^2x^2}}
\end{aligned}$$

$$= -\frac{1}{2}b^2c^2dex\sqrt{d+cdx}\sqrt{e-cex} + \frac{3bc^3dex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}$$
$$+ bcde\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}(a+b\arcsin(cx))$$
$$- \frac{3}{2}c^2dex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2$$
$$- \frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{x}$$
$$- \frac{cde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{2b\sqrt{1-c^2x^2}}$$
$$+ \frac{\left(2bcde\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}(\int(a+bx)\cot(x)\,dx, x, \arcsin(cx))}{\sqrt{1-c^2x^2}}$$
$$- \frac{\left(b^2c^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}$$
$$- \frac{\left(3b^2c^4de\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{1-c^2x^2}}$$

$$= \frac{1}{4}b^2c^2dex\sqrt{d+cdx}\sqrt{e-cex} - \frac{b^2cde\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{2\sqrt{1-c^2x^2}}$$
$$+ \frac{3bc^3dex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}$$
$$+ bcde\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}(a+b\arcsin(cx))$$
$$- \frac{3}{2}c^2dex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2$$
$$- \frac{icde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}$$
$$- \frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{x}$$
$$- \frac{cde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{2b\sqrt{1-c^2x^2}}$$
$$- \frac{\left(4ibcde\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)}{\sqrt{1-c^2x^2}}$$
$$- \frac{\left(3b^2c^2de\sqrt{d+cdx}\sqrt{e-cex}\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{4\sqrt{1-c^2x^2}}$$

$$
\begin{aligned}
&= \frac{1}{4}b^2c^2dex\sqrt{d+cdx}\sqrt{e-cex} - \frac{5b^2cde\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4\sqrt{1-c^2x^2}} \\
&+ \frac{3bc^3dex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&+ bcde\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&- \frac{3}{2}c^2dex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&- \frac{icde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} \\
&- \frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{x} \\
&- \frac{cde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{2b\sqrt{1-c^2x^2}} \\
&+ \frac{2bcde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&- \frac{\left(2b^2cde\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{1}{4}b^2c^2dex\sqrt{d+cdx}\sqrt{e-cex} - \frac{5b^2cde\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4\sqrt{1-c^2x^2}} \\
&+ \frac{3bc^3dex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&+ bcde\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}(a+b\arcsin(cx)) \\
&- \frac{3}{2}c^2dex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&- \frac{icde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} \\
&- \frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{x} \\
&- \frac{cde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{2b\sqrt{1-c^2x^2}} \\
&+ \frac{2bcde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} \\
&+ \frac{\left(ib^2cde\sqrt{d+cdx}\sqrt{e-cex}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}
\end{aligned}
$$

$$= \frac{1}{4}b^2c^2dex\sqrt{d+cdx}\sqrt{e-cex} - \frac{5b^2cde\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4\sqrt{1-c^2x^2}} + \frac{3bc^3dex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} + bcde\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}(a+b\arcsin(cx)) - \frac{3}{2}c^2dex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 - \frac{icde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}} - \frac{de\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{x} - \frac{cde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{2b\sqrt{1-c^2x^2}} + \frac{2bcde\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}} - \frac{ib^2cde\sqrt{d+cdx}\sqrt{e-cex}\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{1-c^2x^2}}$$

Mathematica [A] (verified)

Time = 3.07 (sec) , antiderivative size = 538, normalized size of antiderivative = 1.07

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx = \frac{-8a^2de\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2} - 4a^2c^2dex^2\sqrt{d+}}{}$$

```
[In] Integrate[((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/x^2,x
]

[Out] (-8*a^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2] - 4*a^2*c^2*d
*e*x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2] - 4*b^2*c*d*e*x*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 + 12*a^2*c*d^(3/2)*e^(3/2)*x*Sq
rt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[
e]*(-1 + c^2*x^2))] - 2*a*b*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Cos[2*A
rcSin[c*x]] + 16*a*b*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Log[c*x] - (8*
I)*b^2*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*PolyLog[2, E^((2*I)*ArcSin[c
*x])] + b^2*c*d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sin[2*ArcSin[c*x]] - 2*
b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(8*a*Sqrt[1 - c^2*x^2] +
b*c*x*Cos[2*ArcSin[c*x]] - 8*b*c*x*Log[1 - E^((2*I)*ArcSin[c*x])] + 2*a*c*x
*Sin[2*ArcSin[c*x]]) - 2*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^
2*(6*a*c*x + (4*I)*b*c*x + 4*b*Sqrt[1 - c^2*x^2] + b*c*x*Sin[2*ArcSin[c*x]]
))/(8*x*Sqrt[1 - c^2*x^2])
```

Maple [F]

$$\int \frac{(cdx+d)^{\frac{3}{2}} (-cex+e)^{\frac{3}{2}} (a+b\arcsin(cx))^2}{x^2} dx$$

```
[In] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x)
[Out] int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x)
```

Fricas [F]

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x^2} dx = \int \frac{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{x^2} dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="fricas")
[Out] integral(-(a^2*c^2*d*e*x^2 - a^2*d*e + (b^2*c^2*d*e*x^2 - b^2*d*e)*arcsin(c
*x)^2 + 2*(a*b*c^2*d*e*x^2 - a*b*d*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*
e*x + e)/x^2, x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x^2} dx = \text{Timed out}$$

```
[In] integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/x**2,x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x^2} dx = \text{Exception raised: ValueError}$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx = \int \frac{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin{(cx)}+a)^2}{x^2}\,dx$$

```
[In] integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/x^2,x, algor
ithm="giac")
```

```
[Out] integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/x^2, x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2}{x^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}}{x^2}\,dx$$

```
[In] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/x^2,x)
```

```
[Out] int(((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))/x^2, x)
```

3.586 $\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 250

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \frac{b^2x(1-c^2x^2)}{4c^2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d+cdx}\sqrt{e-cex}} + \frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{x(1-c^2x^2)(a+b\arcsin(cx))^2}{2c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d+cdx}\sqrt{e-cex}}$$

```
[Out] 1/4*b^2*x*(-c^2*x^2+1)/c^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/2*x*(-c^2*x^2
+1)*(a+b*arcsin(c*x))^2/c^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/4*b^2*arcsin
(c*x)*(-c^2*x^2+1)^(1/2)/c^3/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/2*b*x^2*(a+
b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/6*(a
+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^3/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.171, Rules used

= {4823, 4795, 4737, 4723, 327, 222}

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = -\frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2c^2\sqrt{cdx+d}\sqrt{e-cex}} + \frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{cdx+d}\sqrt{e-cex}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{cdx+d}\sqrt{e-cex}} - \frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{cdx+d}\sqrt{e-cex}} + \frac{b^2x(1-c^2x^2)}{4c^2\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (b^2*x*(1 - c^2*x^2))/(4*c^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (b^2*Sqrt[1
 - c^2*x^2]*ArcSin[c*x])/(4*c^3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b*x^2*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
 - (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*c^2*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]) + (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(6*b*c^3*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
```

```
+ e, 0] && NeQ[n, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}} \\
&= -\frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{2c^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad + \frac{\left(b\sqrt{1-c^2x^2}\right)\int x(a+b\arcsin(cx))\,dx}{c\sqrt{d+cdx}\sqrt{e-cex}} \\
&= \frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2c^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(b^2\sqrt{1-c^2x^2}\right)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2\sqrt{d+cdx}\sqrt{e-cex}} \\
&= \frac{b^2x(1-c^2x^2)}{4c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad - \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{2c^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(b^2\sqrt{1-c^2x^2}\right)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4c^2\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}
$$

$$= \frac{b^2x(1-c^2x^2)}{4c^2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d+cdx}\sqrt{e-cex}} + \frac{bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{x(1-c^2x^2)\left(a+b\arcsin(cx)\right)^2}{2c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d+cdx}\sqrt{e-cex}}$$

Mathematica [A] (verified)

Time = 1.47 (sec) , antiderivative size = 326, normalized size of antiderivative = 1.30

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$$
$$= \frac{12b\sqrt{d}\sqrt{e}\left(a\sqrt{1-c^2x^2}+bcx(-1+c^2x^2)\right)\arcsin(cx)^2 + 4b^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\arcsin(cx)^3 - 12a^2\sqrt{d+cdx}}{}$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (12*b*Sqrt[d]*Sqrt[e]*(a*Sqrt[1 - c^2*x^2] + b*c*x*(-1 + c^2*x^2))*ArcSin[c
*x]^2 + 4*b^2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^3 - 12*a^2*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(S
qrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 3*Sqrt[d]*Sqrt[e]*(a*b*Sqrt[1 - c^2*x^2]
+ 2*b^2*c*x*(-1 + c^2*x^2) + a^2*(4*c*x - 4*c^3*x^3) + a*b*Cos[3*ArcSin[c*x
]]) - 3*b*Sqrt[d]*Sqrt[e]*ArcSin[c*x]*(2*a*c*x + b*Sqrt[1 - c^2*x^2] + b*Co
s[3*ArcSin[c*x]] + 2*a*Sin[3*ArcSin[c*x]]))/(24*c^3*Sqrt[d]*Sqrt[e]*Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x])
```

Maple [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\,\sqrt{-cex+e}}dx$$

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^2}{\sqrt{cdx+d}\sqrt{-cex+e}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="fricas")
```

```
[Out] integral(-(b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(c*
d*x + d)*sqrt(-c*e*x + e)/(c^2*d*e*x^2 - d*e), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx=\text{Timed out}$$

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
[Out] Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx=\int \frac{(b\arcsin(cx)+a)^2x^2}{\sqrt{cdx+d}\sqrt{-cex+e}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2*x^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx=\int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x))^2)/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)),x)
[Out] int((x^2*(a + b*asin(c*x))^2)/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)), x)
```

3.587 $\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 177

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b^2(1-c^2x^2)}{c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d+cdx}\sqrt{e-cex}}$$

```
[Out] 2*b^2*(-c^2*x^2+1)/c^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-(-c^2*x^2+1)*(a+b*a
rcsin(c*x))^2/c^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*a*b*x*(-c^2*x^2+1)^(1/
2)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*b^2*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2
)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121, Rules used = {4823, 4767, 4715, 267}

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = -\frac{(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{cdx+d}\sqrt{e-cex}} + \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{cdx+d}\sqrt{e-cex}} + \frac{2b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{c\sqrt{cdx+d}\sqrt{e-cex}} + \frac{2b^2(1-c^2x^2)}{c^2\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (2*a*b*x*Sqrt[1 - c^2*x^2])/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*(1
 - c^2*x^2))/(c^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*x*Sqrt[1 - c^2*
```

```
x^2]*ArcSin[c*x])/(c*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((1 - c^2*x^2)*(a +
 b*ArcSin[c*x])^2)/(c^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}} \\
&= -\frac{(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2b\sqrt{1-c^2x^2}\right)\int (a+b\arcsin(cx))\,dx}{c\sqrt{d+cdx}\sqrt{e-cex}} \\
&= \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\int \arcsin(cx)\,dx}{c\sqrt{d+cdx}\sqrt{e-cex}} \\
&= \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{c\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad - \frac{(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}
$$

$$= \frac{2abx\sqrt{1-c^2x^2}}{c\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b^2(1-c^2x^2)}{c^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b^2x\sqrt{1-c^2x^2}\arcsin(cx)}{c\sqrt{d+cdx}\sqrt{e-cex}} - \frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{c^2\sqrt{d+cdx}\sqrt{e-cex}}$$

Mathematica [A] (verified)

Time = 1.95 (sec) , antiderivative size = 150, normalized size of antiderivative = 0.85

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = -\frac{\sqrt{d+cdx}\sqrt{e-cex}\big(2abcx\sqrt{1-c^2x^2}+a^2(-1+c^2x^2)-2b^2(-1+c^2x^2)+2b\big(bcx\sqrt{1-c^2x^2}+a(-1+}{c^2de(-1+cx)(1+cx)}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] -((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*a*b*c*x*Sqrt[1 - c^2*x^2] + a^2*(-1 +
 c^2*x^2) - 2*b^2*(-1 + c^2*x^2) + 2*b*(b*c*x*Sqrt[1 - c^2*x^2] + a*(-1 + c
^2*x^2))*ArcSin[c*x] + b^2*(-1 + c^2*x^2)*ArcSin[c*x]^2))/(c^2*d*e*(-1 + c*
x)*(1 + c*x)))
```

Maple [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\,\sqrt{-cex+e}}dx$$

```
[In] int(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.78

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = -\frac{\left((a^2-2\,b^2)c^2x^2+(b^2c^2x^2-b^2)\arcsin(cx)^2-a^2+2\,b^2+2\,(abc^2x^2-ab)\arcsin(cx)+2\,(b^2cx\arcsin(c\right.}{c^4dex^2-c^2de}$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="fricas")
```

```
[Out] -((a^2 - 2*b^2)*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(c*x)^2 - a^2 + 2*b^2 +
 2*(a*b*c^2*x^2 - a*b)*arcsin(c*x) + 2*(b^2*c*x*arcsin(c*x) + a*b*c*x)*sqrt
(-c^2*x^2 + 1))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^4*d*e*x^2 - c^2*d*e)
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{x(a+b\,\mathrm{asin}\,(cx))^2}{\sqrt{d\,(cx+1)}\sqrt{-e\,(cx-1)}}\,dx$$

```
[In] integrate(x*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
[Out] Integral(x*(a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin\,(cx)+a)^2x}{\sqrt{cdx+d}\sqrt{-cex+e}}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2*x/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{x\,(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}\,dx$$

```
[In] int((x*(a + b*asin(c*x))^2)/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)),x)
[Out] int((x*(a + b*asin(c*x))^2)/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)), x)
```

3.588 $\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 55

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx=\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}$$

```
[Out] 1/3*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(
1/2)
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {4763, 4737}

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx=\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x])
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}$$
$$= \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}$$

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 159 vs. 2(55) = 110.

Time = 0.22 (sec) , antiderivative size = 159, normalized size of antiderivative = 2.89

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \frac{\frac{3ab\sqrt{1-c^2x^2}\arcsin(cx)^2}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{b^2\sqrt{1-c^2x^2}\arcsin(cx)^3}{\sqrt{d+cdx}\sqrt{e-cex}} - \frac{3a^2\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right)}{\sqrt{d}\sqrt{e}}}{3c}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] ((3*a*b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
+ (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^3)/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) -
 (3*a^2*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 +
 c^2*x^2))])/(Sqrt[d]*Sqrt[e]))/(3*c)
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\,\sqrt{-cex+e}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}\sqrt{-cex+e}}\,dx$$

[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm ="fricas")

[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^2*d*e*x^2 - d*e), x)

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{\sqrt{d(cx+1)}\sqrt{-e(cx-1)}}\,dx$$

[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)

[Out] Integral((a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))), x)

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \text{Exception raised: ValueError}$$

[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm ="maxima")

[Out] Exception raised: ValueError >> Computation failed since Maxima requested additional constraints; using the 'assume' command before evaluation *may* help (example of legal syntax is 'assume(e>0)', see `assume?` for more details)Is e

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}\sqrt{-cex+e}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorithm
="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)),x)
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)), x)
```

3.589 $\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 287

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}}\,dx = &-\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}\\ &+\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}\\ &-\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}\\ &-\frac{2b^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}\\ &+\frac{2b^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}\end{aligned}$$

```
[Out] -2*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)
/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*I*b*(a+b*arcsin(c*x))*polylog(2,-I*c*x-
(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*I
*b*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)
/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*b^2*polylog(3,-I*c*x-(-c^2*x^2+1)^(1/2)
)*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*b^2*polylog(3,I*c*x
+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.171$, Rules used = {4823, 4803, 4268, 2611, 2320, 6724}

$$\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}}\,dx = -\frac{2\sqrt{1-c^2x^2}\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\sqrt{e-cex}} + \frac{2ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{cdx+d}\sqrt{e-cex}} - \frac{2ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{cdx+d}\sqrt{e-cex}} - \frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{cdx+d}\sqrt{e-cex}} + \frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (-2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTanh[E^(I*ArcSin[c*x])])/(Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c
*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((
2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I*ArcSin[c*x])])
/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E
^(I*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (2*b^2*Sqrt[1 - c^2*
x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= \frac{\sqrt{1-c^2x^2}\,\text{Subst}\left(\int (a+bx)^2\csc(x)\,dx,x,\arcsin(cx)\right)}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= -\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\operatorname{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&\quad-\frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&\quad+\frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}$$

$$=-\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\text{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\text{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$=-\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\text{PolyLog}(2,-x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\text{PolyLog}(2,x)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$=-\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}$$

Mathematica [A] (verified)

Time = 2.62 (sec) , antiderivative size = 336, normalized size of antiderivative = 1.17

$$\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \frac{a^2\log(cx)}{\sqrt{d}\sqrt{e}} - \frac{a^2\log\left(de+\sqrt{d}\sqrt{e}\sqrt{d+cdx}\sqrt{e-cex}\right)}{\sqrt{d}\sqrt{e}}$$
$$+ \frac{2ab\sqrt{1-c^2x^2}\left(\arcsin(cx)\left(\log\left(1-e^{i\arcsin(cx)}\right)-\log\left(1+e^{i\arcsin(cx)}\right)\right)+i\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)-i\,\text{I}\ldots\right.}{\sqrt{d+cdx}\sqrt{e-cex}}$$
$$+ \frac{b^2\sqrt{1-c^2x^2}\left(\arcsin(cx)^2\log\left(1-e^{i\arcsin(cx)}\right)-\arcsin(cx)^2\log\left(1+e^{i\arcsin(cx)}\right)+2i\arcsin(cx)\,\text{PolyLog}\ldots\right.}{\sqrt{d+\ldots}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (a^2*Log[c*x])/(Sqrt[d]*Sqrt[e]) - (a^2*Log[d*e + Sqrt[d]*Sqrt[e]*Sqrt[d +
c*d*x]*Sqrt[e - c*e*x]])/(Sqrt[d]*Sqrt[e]) + (2*a*b*Sqrt[1 - c^2*x^2]*(ArcS
in[c*x]*(Log[1 - E^(I*ArcSin[c*x])] - Log[1 + E^(I*ArcSin[c*x])]) + I*PolyL
og[2, -E^(I*ArcSin[c*x])] - I*PolyLog[2, E^(I*ArcSin[c*x])]))/(Sqrt[d + c*d
*x]*Sqrt[e - c*e*x]) + (b^2*Sqrt[1 - c^2*x^2]*(ArcSin[c*x]^2*Log[1 - E^(I*A
rcSin[c*x])] - ArcSin[c*x]^2*Log[1 + E^(I*ArcSin[c*x])] + (2*I)*ArcSin[c*x]
*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*ArcSin[c*x]*PolyLog[2, E^(I*ArcSin[
c*x])] - 2*PolyLog[3, -E^(I*ArcSin[c*x])] + 2*PolyLog[3, E^(I*ArcSin[c*x])]
))/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{cdx+d}\,\sqrt{-cex+e}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}\sqrt{-cex+e}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^2*d*e*x^3 - d*e*x), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{x\sqrt{d(cx+1)}\sqrt{-e(cx-1)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
[Out] Integral((a + b*asin(c*x))**2/(x*sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}\sqrt{-cex+ex}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorit
hm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(a+b\operatorname{asin}(c\,x))^2}{x\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)),x)
[Out] int((a + b*asin(c*x))^2/(x*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)), x)
```

3.590 $\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 214

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d+cdx}\sqrt{e-cex}}\,dx = -\frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}} - \frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}} - \frac{ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}$$

```
[Out] -(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-I*c*(a
+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*b*c
*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/(c
*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-I*b^2*c*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))
^2)*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used

$= \{4823, 4771, 4721, 3798, 2221, 2317, 2438\}$

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d+cdx}\sqrt{e-cex}}\,dx = -\frac{(1-c^2x^2)\,(a+b\arcsin(cx))^2}{x\sqrt{cdx+d}\sqrt{e-cex}} - \frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\sqrt{e-cex}} + \frac{2bc\sqrt{1-c^2x^2}\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{\sqrt{cdx+d}\sqrt{e-cex}} - \frac{ib^2c\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] ((-I)*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(Sqrt[d + c*d*x]*Sqrt[e -
c*e*x]) - ((1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(x*Sqrt[d + c*d*x]*Sqrt[e -
 c*e*x]) + (2*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*Ar
cSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*b^2*c*Sqrt[1 - c^2*x^2]
*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4771

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Dist[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*Ar
cSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^2
*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{1-c^2x^2}}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= -\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}}+\frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{x}\,dx}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= -\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}}+\frac{\left(2bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= -\frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}}\\
&\quad-\frac{\left(4ibc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right)}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&= -\frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}-\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}}\\
&\quad+\frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}\\
&\quad-\frac{\left(2b^2c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}
$$

$$= -\frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}} - \frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(ib^2c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}} - \frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{x\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}} - \frac{ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)}{\sqrt{d+cdx}\sqrt{e-cex}}$$

Mathematica [A] (verified)

Time = 2.67 (sec) , antiderivative size = 189, normalized size of antiderivative = 0.88

$$\int\frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \frac{b^2\left(-1+c^2x^2-icx\sqrt{1-c^2x^2}\right)\arcsin(cx)^2+2b\arcsin(cx)\left(-a+ac^2x^2+bcx\sqrt{1-c^2x^2}\log\left(1-e^{2i\arcsin(cx)}\right.\right.}{x\sqrt{d+cdx}\sqrt{e-ce}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]),x]
```

```
[Out] (b^2*(-1 + c^2*x^2 - I*c*x*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*b*ArcSin[c*
x]*(-a + a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2]*Log[1 - E^((2*I)*ArcSin[c*x])]
) + a*(-a + a*c^2*x^2 + 2*b*c*x*Sqrt[1 - c^2*x^2]*Log[c*x]) - I*b^2*c*x*Sqr
t[1 - c^2*x^2]*PolyLog[2, E^((2*I)*ArcSin[c*x])])/(x*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x])
```

Maple [F]

$$\int\frac{(a+b\arcsin(cx))^2}{x^2\sqrt{cdx+d}\,\sqrt{-cex+e}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}\sqrt{-cex+ex^2}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="fricas")
```

```
[Out] integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^2*d*e*x^4 - d*e*x^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2}{x^2\sqrt{d\,(cx+1)}\sqrt{-e\,(cx-1)}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**2*sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))),
x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}\sqrt{-cex+ex^2}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algor
ithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*x^2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2\sqrt{d+cdx}\sqrt{e-cex}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)), x)
```

3.591 $\int \frac{x^2(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 295

$$
\begin{aligned}
\int \frac{x^2(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx &= \frac{x(a+b\arcsin(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3de\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3de\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}
$$

```
[Out] x*(a+b*arcsin(c*x))^2/c^2/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-I*(a+b*arcsi
n(c*x))^2*(-c^2*x^2+1)^(1/2)/c^3/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/3*(
a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^3/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^
(1/2)+2*b*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)
^(1/2)/c^3/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-I*b^2*polylog(2,-(I*c*x+(-c
^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(
1/2)
```

Rubi [A] (verified)

Time = 0.51 (sec) , antiderivative size = 295, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.229$, Rules used = {4823, 4791, 4737, 4765, 3800, 2221, 2317, 2438}

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{x(a+b\arcsin(cx))^2}{c^2de\sqrt{cdx+d}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3de\sqrt{cdx+d}\sqrt{e-cex}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3de\sqrt{cdx+d}\sqrt{e-cex}} + \frac{2b\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^3de\sqrt{cdx+d}\sqrt{e-cex}} - \frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3de\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (x*(a + b*ArcSin[c*x])^2)/(c^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*Sq
rt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(c^3*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x]) - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^3)/(3*b*c^3*d*e*Sqrt[d + c*d
*x]*Sqrt[e - c*e*x]) + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*Log[1 + E
^((2*I)*ArcSin[c*x])])/(c^3*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*b^2*S
qrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c^3*d*e*Sqrt[d + c*d*
x]*Sqrt[e - c*e*x])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4737

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4791

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(2*e*(p + 1))), x] + (-Dist[f^2*((m - 1)/(2*e*(p + 1))),
Int[(f*x)^(m - 2)*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[
b*f*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m - 1
)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a,
 b, c, d, e, f}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] && IGtQ
[m, 1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{x^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{x(a+b\arcsin(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\,dx}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{cde\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{x(a+b\arcsin(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{c^3de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{x(a+b\arcsin(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(4ib\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx,x,\arcsin(cx)\right)}{c^3de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{x(a+b\arcsin(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{c^3de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{x(a+b\arcsin(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{c^3de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{x(a+b\arcsin(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3de\sqrt{d+cdx}\sqrt{e-cex}}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 636 vs. 2(295) = 590.

Time = 3.43 (sec) , antiderivative size = 636, normalized size of antiderivative = 2.16

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{3a^2c\sqrt{d}ex+3a^2\sqrt{e}\sqrt{d+cdx}\sqrt{e-cex}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right)+3ab\sqrt{de}$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
,x]
```

```
[Out] (3*a^2*c*Sqrt[d]*e*x + 3*a^2*Sqrt[e]*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcTan
[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] +
3*a*b*Sqrt[d]*e*(2*c*x*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*(-ArcSin[c*x]^2 + 2*
(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + Log[Cos[ArcSin[c*x]/2] + Si
n[ArcSin[c*x]/2]]))) + b^2*Sqrt[d]*e*((6*I)*Pi*Sqrt[1 - c^2*x^2]*ArcSin[c*x
] + 3*c*x*ArcSin[c*x]^2 - (3*I)*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 - Sqrt[1 -
c^2*x^2]*ArcSin[c*x]^3 + 12*Pi*Sqrt[1 - c^2*x^2]*Log[1 + E^((-I)*ArcSin[c*x
])] + 3*Pi*Sqrt[1 - c^2*x^2]*Log[1 - I*E^(I*ArcSin[c*x])] + 6*Sqrt[1 - c^2*
x^2]*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 3*Pi*Sqrt[1 - c^2*x^2]*Log[
1 + I*E^(I*ArcSin[c*x])] + 6*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*A
rcSin[c*x])] - 12*Pi*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2]] + 3*Pi*Sqrt[
1 - c^2*x^2]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 3*Pi*Sqrt[1 - c^2*x^2]*Log
[Sin[(Pi + 2*ArcSin[c*x])/4]] - (6*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(
I*ArcSin[c*x])] - (6*I)*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])]))
/(3*c^3*d^(3/2)*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Maple [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] int(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="fricas")
```

```
[Out] integral((b^2*x^2*arcsin(c*x)^2 + 2*a*b*x^2*arcsin(c*x) + a^2*x^2)*sqrt(c*d
*x + d)*sqrt(-c*e*x + e)/(c^4*d^2*e^2*x^4 - 2*c^2*d^2*e^2*x^2 + d^2*e^2), x
)
```

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{x^2(a+b\operatorname{asin}(cx))^2}{(d(cx+1))^{\frac{3}{2}}\,(-e(cx-1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x**2*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))**2/((d*(c*x + 1))**(3/2)*(-e*(c*x - 1))**(3
/2)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)),
 x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x))^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x)
```

```
[Out] int((x^2*(a + b*asin(c*x))^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)), x)
```

3.592 $\int \frac{x(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 244

$$\int \frac{x(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx=\frac{(a+b\arcsin(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}}+\frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}}$$

```
[Out] (a+b*arcsin(c*x))^2/c^2/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+4*I*b*(a+b*arc
sin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^2/d/e/(c*d*
x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*I*b^2*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2))
)*(-c^2*x^2+1)^(1/2)/c^2/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*I*b^2*polyl
og(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d/e/(c*d*x+d)^(1/
2)/(-c*e*x+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 244, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4823, 4767, 4749, 4266, 2317, 2438}

$$\int \frac{x(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx=\frac{4ib\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^2de\sqrt{cdx+d}\sqrt{e-cex}}+\frac{(a+b\arcsin(cx))^2}{c^2de\sqrt{cdx+d}\sqrt{e-cex}}-\frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2de\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2de\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[In] Int[(x*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (a + b*ArcSin[c*x])^2/(c^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((4*I)*b*
Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(c^2*d*e*S
qrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (
-I)*E^(I*ArcSin[c*x])])/(c^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*
b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^2*d*e*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
```

```
x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$\text{integral} = \frac{\sqrt{1-c^2x^2}\int \frac{x(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{(a+b\arcsin(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{cde\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{(a+b\arcsin(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\sec(x)\,dx, x, \arcsin(cx)\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{(a+b\arcsin(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1-ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1+ie^{ix}\right)\,dx, x, \arcsin(cx)\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{(a+b\arcsin(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{\log(1+ix)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{(a+b\arcsin(cx))^2}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2, -ie^{i\arcsin(cx)}\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2, ie^{i\arcsin(cx)}\right)}{c^2de\sqrt{d+cdx}\sqrt{e-cex}}$$

Mathematica [A] (verified)

Time = 3.78 (sec) , antiderivative size = 453, normalized size of antiderivative = 1.86

$$\int \frac{x(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{a^2+2ab\arcsin(cx)+ib^2\pi\sqrt{1-c^2x^2}\arcsin(cx)+b^2\arcsin(cx)^2-b^2\pi\sqrt{1-}}{}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x
]
```

```
[Out] (a^2 + 2*a*b*ArcSin[c*x] + I*b^2*Pi*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + b^2*Arc
Sin[c*x]^2 - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*b^2*
Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - b^2*Pi*Sqrt[1
- c^2*x^2]*Log[1 + I*E^(I*ArcSin[c*x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*
x]*Log[1 + I*E^(I*ArcSin[c*x])] + b^2*Pi*Sqrt[1 - c^2*x^2]*Log[-Cos[(Pi + 2
*ArcSin[c*x])/4]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]] - 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin
[c*x]/2]] + b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (2*
I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (2*I)*b^2*Sqr
t[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c^2*d*e*Sqrt[d + c*d*x]*Sq
rt[e - c*e*x])
```

Maple [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}dx$$

```
[In] int(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Fricas [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="fricas")
```

```
[Out] integral((b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) + a^2*x)*sqrt(c*d*x + d
)*sqrt(-c*e*x + e)/(c^4*d^2*e^2*x^4 - 2*c^2*d^2*e^2*x^2 + d^2*e^2), x)
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{x(a+b\operatorname{asin}(cx))^2}{(d(cx+1))^{\frac{3}{2}}(-e(cx-1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Integral(x*(a + b*asin(c*x))**2/((d*(c*x + 1))**(3/2)*(-e*(c*x - 1))**(3/2)
), x)
```

Maxima [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="maxima")
```

```
[Out] sqrt(d)*sqrt(e)*integrate((b^2*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
^2 + 2*a*b*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt
(-c*x + 1)/(c^4*d^2*e^2*x^4 - 2*c^2*d^2*e^2*x^2 + d^2*e^2), x) + a^2/(sqrt(
-c^2*d*e*x^2 + d*e)*c^2*d*e)
```

Giac [F]

$$\int \frac{x(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2x}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2*x/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)), x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{x\,(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}}\,dx$$

```
[In] int((x*(a + b*asin(c*x))^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x)
[Out] int((x*(a + b*asin(c*x))^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)), x)
```

3.593 $\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 217

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx &= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{i(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{2b(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{ib^2(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}\end{aligned}$$

```
[Out] x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*(-c^2
*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*b*(-
c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*
d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*b^2*(-c^2*x^2+1)^(3/2)*polylog(2,-(I*c*x+(-
c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)
```

Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.219, Rules used

$= \{4763, 4745, 4765, 3800, 2221, 2317, 2438\}$

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = -\frac{i(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{x(1-c^2x^2)(a+b\arcsin(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}} + \frac{2b(1-c^2x^2)^{3/2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c(cdx+d)^{3/2}(e-cex)^{3/2}} - \frac{ib^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(cdx+d)^{3/2}(e-cex)^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (x*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2
)) - (I*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(c*(d + c*d*x)^(3/2)*(e
- c*e*x)^(3/2)) + (2*b*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + E^((
2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)) - (I*b^2*(1 - c
^2*x^2)^(3/2)*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/(c*(d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2))
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4763

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Dist[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q), Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
/; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2 -
 e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{(1-c^2x^2)^{3/2}\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2bc(1-c^2x^2)^{3/2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{\left(2b(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int (a+bx)\tan(x)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{\left(4ib(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad + \frac{2b(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&\quad - \frac{\left(2b^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

$$= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{\left(ib^2(1-c^2x^2)^{3/2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

$$= \frac{x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{i(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} + \frac{2b(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{ib^2(1-c^2x^2)^{3/2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}$$

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 550 vs. $2(217) = 434$.

Time = 0.69 (sec) , antiderivative size = 550, normalized size of antiderivative = 2.53

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{a^2cx + 2abcx\arcsin(cx) + 2ib^2\pi\sqrt{1-c^2x^2}\arcsin(cx) + b^2cx\arcsin(cx)^2 -}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (a^2*c*x + 2*a*b*c*x*ArcSin[c*x] + (2*I)*b^2*Pi*Sqrt[1 - c^2*x^2]*ArcSin[c*
x] + b^2*c*x*ArcSin[c*x]^2 - I*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 + 4*b^2*
Pi*Sqrt[1 - c^2*x^2]*Log[1 + E^((-I)*ArcSin[c*x])] + b^2*Pi*Sqrt[1 - c^2*x^
2]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1
 - I*E^(I*ArcSin[c*x])] - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[1 + I*E^(I*ArcSin[c*
x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - 4
*b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2]] + b^2*Pi*Sqrt[1 - c^2*x^2
]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSi
n[c*x]/2] - Sin[ArcSin[c*x]/2]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2]] - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcS
in[c*x])/4]] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x]
)] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*d*e*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x])
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
[Out] int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="fricas")
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^4*d^2*e^2*x^4 - 2*c^2*d^2*e^2*x^2 + d^2*e^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{(d(cx+1))^{\frac{3}{2}}(-e(cx-1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
[Out] Integral((a + b*asin(c*x))**2/((d*(c*x + 1))**(3/2)*(-e*(c*x - 1))**(3/2)),
 x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="maxima")
[Out] -b^2*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^2*d*e*x^2 -
 d*e)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/(sqrt(d)*sqrt(e)) + 2*a*b*x*arcsin(
c*x)/(sqrt(-c^2*d*e*x^2 + d*e)*d*e) + a^2*x/(sqrt(-c^2*d*e*x^2 + d*e)*d*e)
- a*b*sqrt(1/(d*e))*log(x^2 - 1/c^2)/(c*d*e)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorithm
="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)), x)
```

3.594 $\int \frac{(a+b\arcsin(cx))^2}{x(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 548

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx &= \frac{(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}}\\
&+\frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}\\
&-\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\mathrm{arctanh}\left(e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}\\
&+\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}\\
&-\frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}\\
&+\frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}\\
&-\frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}\\
&-\frac{2b^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}\end{aligned}$$

```
[Out] (a+b*arcsin(c*x))^2/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+4*I*b*(a+b*arcsin(
c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/
2)/(-c*e*x+e)^(1/2)-2*(a+b*arcsin(c*x))^2*arctanh(I*c*x+(-c^2*x^2+1)^(1/2))
*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*I*b*(a+b*arcsin(
c*x))*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)
^(1/2)/(-c*e*x+e)^(1/2)-2*I*b^2*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-
c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*I*b^2*polylog(2,I*(
```

```
I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e
)^(1/2)-2*I*b*(a+b*arcsin(c*x))*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x
^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*b^2*polylog(3,-I*c*x-(-c
^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*
b^2*polylog(3,I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1
/2)/(-c*e*x+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.60 (sec) , antiderivative size = 548, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.314$, Rules used = {4823, 4793, 4803, 4268, 2611, 2320, 6724, 4749, 4266, 2317, 2438}

$$\int \frac{(a+b\arcsin(cx))^2}{x(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{4ib\sqrt{1-c^2x^2}\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{de\sqrt{cdx+d}\sqrt{e-cex}}$$
$$-\frac{2\sqrt{1-c^2x^2}\text{arctanh}\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))^2}{de\sqrt{cdx+d}\sqrt{e-cex}}$$
$$+\frac{2ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{de\sqrt{cdx+d}\sqrt{e-cex}}$$
$$-\frac{2ib\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{de\sqrt{cdx+d}\sqrt{e-cex}}+\frac{(a+b\arcsin(cx))^2}{de\sqrt{cdx+d}\sqrt{e-cex}}$$
$$-\frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{de\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{de\sqrt{cdx+d}\sqrt{e-cex}}$$
$$-\frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{de\sqrt{cdx+d}\sqrt{e-cex}}+\frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{de\sqrt{cdx+d}\sqrt{e-cex}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (a + b*ArcSin[c*x])^2/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((4*I)*b*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/(d*e*Sqrt[d +
c*d*x]*Sqrt[e - c*e*x]) - (2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2*ArcTan
h[E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*b*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, -E^(I*ArcSin[c*x])])/(d*e*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]) - ((2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + ((2*I)*b^2*Sqr
t[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]) - ((2*I)*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*PolyLog[2, E^(I
*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (2*b^2*Sqrt[1 - c^2
*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
 + (2*b^2*Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])])/(d*e*Sqrt[d + c*
d*x]*Sqrt[e - c*e*x])
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4266

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[-2*(c + d*x)^m*(ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))]/f), x] + (-Di
st[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[d*(m/f), Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4749

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Dist[1/(c*d), Subst[Int[(a + b*x)^n*Sec[x], x], x, ArcSin[c*x]], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4793

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(-(f*x)^(m + 1))*(d + e*x^2)^(p + 1)*((a
+ b*ArcSin[c*x])^n/(2*d*f*(p + 1))), x] + (Dist[(m + 2*p + 3)/(2*d*(p + 1))
, Int[(f*x)^m*(d + e*x^2)^(p + 1)*(a + b*ArcSin[c*x])^n, x], x] + Dist[b*c*
(n/(2*f*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
c, d, e, f, m}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p, -1] &&  !GtQ
[m, 1] && (IntegerQ[m] || IntegerQ[p] || EqQ[n, 1])
```

Rule 4803

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Dist[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]], Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{x(1-c^2x^2)^{3/2}}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}}\\
&= \frac{(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}}+\frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{x\sqrt{1-c^2x^2}}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}}-\frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{1-c^2x^2}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}}\\
&= \frac{(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}}+\frac{\sqrt{1-c^2x^2}\text{Subst}\left(\int (a+bx)^2\csc(x)\,dx,x,\arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}\\
&\quad -\frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int (a+bx)\sec(x)\,dx,x,\arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}
$$

$$= \frac{(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$+ \frac{\left(2b\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\log\left(1+e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$+ \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1-ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\log\left(1+ie^{ix}\right)\,dx,x,\arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$+ \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1-ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$+ \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+ix)}{x}\,dx,x,e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\text{PolyLog}\left(2,-e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$+ \frac{\left(2ib^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\text{PolyLog}\left(2,e^{ix}\right)\,dx,x,\arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$+ \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$+ \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{\text{PolyLog}(2,-x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$+ \frac{\left(2b^2\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{\text{PolyLog}(2,x)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= \frac{(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\text{arctanh}\left(e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$+ \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$+ \frac{2ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$
$$- \frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,-e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2b^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,e^{i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

Mathematica [A] (verified)

Time = 6.47 (sec) , antiderivative size = 877, normalized size of antiderivative = 1.60

$$\int \frac{(a+b\arcsin(cx))^2}{x(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{-\frac{a^2\sqrt{d+cdx}\sqrt{e-cex}}{-1+c^2x^2}+a^2\sqrt{d}\sqrt{e}\log(cx)-a^2\sqrt{d}\sqrt{e}\log\left(de+\sqrt{d}\sqrt{e}\sqrt{d+cdx}\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] (-((a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(-1 + c^2*x^2)) + a^2*Sqrt[d]*Sqrt
[e]*Log[c*x] - a^2*Sqrt[d]*Sqrt[e]*Log[d*e + Sqrt[d]*Sqrt[e]*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x]] + (2*a*b*d*e*(ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x
]*Log[1 - E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + E^(I*A
rcSin[c*x])] + Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2
]] - Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + I*Sqr
t[1 - c^2*x^2]*PolyLog[2, -E^(I*ArcSin[c*x])] - I*Sqrt[1 - c^2*x^2]*PolyLog
[2, E^(I*ArcSin[c*x])]))/(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (b^2*d*e*(I*Pi
*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + ArcSin[c*x]^2 + Sqrt[1 - c^2*x^2]*ArcSin[c
*x]^2*Log[1 - E^(I*ArcSin[c*x])] - Pi*Sqrt[1 - c^2*x^2]*Log[1 - I*E^(I*ArcS
in[c*x])] - 2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] -
Pi*Sqrt[1 - c^2*x^2]*Log[1 + I*E^(I*ArcSin[c*x])] + 2*Sqrt[1 - c^2*x^2]*Arc
Sin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2*Log
[1 + E^(I*ArcSin[c*x])] + Pi*Sqrt[1 - c^2*x^2]*Log[-Cos[(Pi + 2*ArcSin[c*x]
)/4]] + Pi*Sqrt[1 - c^2*x^2]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (2*I)*Sqrt[
1 - c^2*x^2]*ArcSin[c*x]*PolyLog[2, -E^(I*ArcSin[c*x])] - (2*I)*Sqrt[1 - c^
2*x^2]*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + (2*I)*Sqrt[1 - c^2*x^2]*PolyLog
[2, I*E^(I*ArcSin[c*x])] - (2*I)*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*PolyLog[2, E
^(I*ArcSin[c*x])] - 2*Sqrt[1 - c^2*x^2]*PolyLog[3, -E^(I*ArcSin[c*x])] + 2*
Sqrt[1 - c^2*x^2]*PolyLog[3, E^(I*ArcSin[c*x])]))/(Sqrt[d + c*d*x]*Sqrt[e -
 c*e*x]))/(d^2*e^2)
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x\,(cdx+d)^{\frac{3}{2}}\,(-cex+e)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

```
[Out] int((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="fricas")
```

```
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^4*d^2*e^2*x^5 - 2*c^2*d^2*e^2*x^3 + d^2*e^2*x), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{x\,(d\,(cx+1))^{\frac{3}{2}}\,(-e\,(cx-1))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x*(d*(c*x + 1))**(3/2)*(-e*(c*x - 1))**(3/2)
), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{x(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx=\int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorit
hm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*x), x
)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{x\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x)
```

```
[Out] int((a + b*asin(c*x))^2/(x*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)), x)
```

3.595 $\int \frac{(a+b\arcsin(cx))^2}{x^2(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 396

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{x^2(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx &= -\frac{(a+b\arcsin(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} \\ &+ \frac{2c^2x(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} \\ &- \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} \\ &+ \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} \\ &- \frac{ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}\end{aligned}$$

```
[Out] -(a+b*arcsin(c*x))^2/d/e/x/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*c^2*x*(a+b*ar
csin(c*x))^2/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*I*c*(a+b*arcsin(c*x))^2
*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-4*b*c*(a+b*arcsin(
c*x))*arctanh((I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d
)^(1/2)/(-c*e*x+e)^(1/2)+4*b*c*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(
1/2))^2)*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-I*b^2*c*po
lylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/d/e/(c*d*x+d)^(1/
2)/(-c*e*x+e)^(1/2)-I*b^2*c*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x
^2+1)^(1/2)/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.60 (sec) , antiderivative size = 396, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {4823, 4789, 4745, 4765, 3800, 2221, 2317, 2438, 4769, 4504, 4268}

$$\begin{aligned}
\int \frac{(a+b\arcsin(cx))^2}{x^2(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = & -\frac{4bc\sqrt{1-c^2x^2}\operatorname{arctanh}\left(e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{de\sqrt{cdx+d}\sqrt{e-cex}} \\
& -\frac{2ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{de\sqrt{cdx+d}\sqrt{e-cex}} \\
& +\frac{4bc\sqrt{1-c^2x^2}\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{de\sqrt{cdx+d}\sqrt{e-cex}} \\
& +\frac{2c^2x(a+b\arcsin(cx))^2}{de\sqrt{cdx+d}\sqrt{e-cex}}-\frac{(a+b\arcsin(cx))^2}{dex\sqrt{cdx+d}\sqrt{e-cex}} \\
& -\frac{ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{de\sqrt{cdx+d}\sqrt{e-cex}}-\frac{ib^2c\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{de\sqrt{cdx+d}\sqrt{e-cex}}
\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])^2/(d*e*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])) + (2*c^2*x
*(a + b*ArcSin[c*x])^2)/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - ((2*I)*c*Sq
rt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]
) - (4*b*c*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])*ArcTanh[E^((2*I)*ArcSin[c*
x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) + (4*b*c*Sqrt[1 - c^2*x^2]*(a +
 b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e
 - c*e*x]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog[2, -E^((2*I)*ArcSin[c*x])])
/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]) - (I*b^2*c*Sqrt[1 - c^2*x^2]*PolyLog
[2, E^((2*I)*ArcSin[c*x])])/(d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3800

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m*(E^(2*I*(e
 + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4268

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Dist[d*(m/f), Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[d*(m/f), Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4504

```
Int[Csc[(a_.) + (b_.)*(x_)]^(n_.)*((c_.) + (d_.)*(x_))^(m_.)*Sec[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Dist[2^n, Int[(c + d*x)^m*Csc[2*a + 2*b*x]^n,
 x], x] /; FreeQ[{a, b, c, d, m}, x] && IntegerQ[n] && RationalQ[m]
```

Rule 4745

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Dist[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]], Int[x*((a + b*ArcSin[c*x]
)^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
+ e, 0] && GtQ[n, 0]
```

Rule 4765

```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Dist[-e^(-1), Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x]
], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4769

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Dist[1/d, Subst[Int[(a + b*x)^n/(Cos[x]*Sin[x]), x], x, ArcSin
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Rule 4789

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Dist[c^2*((m + 2*p + 3)/(f^2*(m + 1))
), Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Dist[b*c
*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)^(m + 1)*(1
- c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

Rule 4823

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((h_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(p_)*((f_) + (g_.)*(x_))^(q_), x_Symbol] :> Dist[((-d^2)*(g/e))^In
tPart[q]*(d + e*x)^FracPart[q]*((f + g*x)^FracPart[q]/(1 - c^2*x^2)^FracPar
t[q]), Int[(h*x)^m*(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n,
 x], x] /; FreeQ[{a, b, c, d, e, f, g, h, m, n}, x] && EqQ[e*f + d*g, 0] &&
 EqQ[c^2*d^2 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{x^2(1-c^2x^2)^{3/2}}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}} \\
&= -\frac{(a+b\arcsin(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\int \frac{a+b\arcsin(cx)}{x(1-c^2x^2)}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad + \frac{\left(2c^2\sqrt{1-c^2x^2}\right)\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}} \\
&= -\frac{(a+b\arcsin(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad + \frac{\left(2bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\csc(x)\sec(x)\,dx,x,\arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad - \frac{\left(4bc^3\sqrt{1-c^2x^2}\right)\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}\,dx}{de\sqrt{d+cdx}\sqrt{e-cex}} \\
&= -\frac{(a+b\arcsin(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad + \frac{\left(4bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\csc(2x)\,dx,x,\arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} \\
&\quad - \frac{\left(4bc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int(a+bx)\tan(x)\,dx,x,\arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}
$$

$$= -\frac{(a+b\arcsin(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(8ibc\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1+e^{2ix}}\,dx, x, \arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(2b^2c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2b^2c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{(a+b\arcsin(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(ib^2c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(ib^2c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{\left(4b^2c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int \log\left(1+e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{(a+b\arcsin(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{\left(2ib^2c\sqrt{1-c^2x^2}\right)\text{Subst}\left(\int\frac{\log(1+x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

$$= -\frac{(a+b\arcsin(cx))^2}{dex\sqrt{d+cdx}\sqrt{e-cex}} + \frac{2c^2x(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\text{arctanh}\left(e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}} - \frac{ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{de\sqrt{d+cdx}\sqrt{e-cex}}$$

Mathematica [A] (verified)

Time = 4.39 (sec) , antiderivative size = 564, normalized size of antiderivative = 1.42

$$\int\frac{(a+b\arcsin(cx))^2}{x^2(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{c\csc\left(\frac{1}{2}\arcsin(cx)\right)\sec\left(\frac{1}{2}\arcsin(cx)\right)\left(-2a^2+4a^2c^2x^2-4ab\arcsin(cx)\,\text{co}\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x
]
```

```
[Out] (c*Csc[ArcSin[c*x]/2]*Sec[ArcSin[c*x]/2]*(-2*a^2 + 4*a^2*c^2*x^2 - 4*a*b*Ar
cSin[c*x]*Cos[2*ArcSin[c*x]] - 2*b^2*ArcSin[c*x]^2*Cos[2*ArcSin[c*x]] + (2*
```

```
I)*b^2*Pi*ArcSin[c*x]*Sin[2*ArcSin[c*x]] - (2*I)*b^2*ArcSin[c*x]^2*Sin[2*Ar
cSin[c*x]] + 4*b^2*Pi*Log[1 + E^((-I)*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] + b^
2*Pi*Log[1 - I*E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] + 2*b^2*ArcSin[c*x]*Lo
g[1 - I*E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] - b^2*Pi*Log[1 + I*E^(I*ArcSi
n[c*x])]*Sin[2*ArcSin[c*x]] + 2*b^2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])
]*Sin[2*ArcSin[c*x]] + 2*b^2*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])]*Sin
[2*ArcSin[c*x]] + 2*a*b*Log[c*x]*Sin[2*ArcSin[c*x]] - 4*b^2*Pi*Log[Cos[ArcS
in[c*x]/2]]*Sin[2*ArcSin[c*x]] + b^2*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]]*S
in[2*ArcSin[c*x]] + 2*a*b*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]*Sin[
2*ArcSin[c*x]] + 2*a*b*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]*Sin[2*A
rcSin[c*x]] - b^2*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]*Sin[2*ArcSin[c*x]] -
(2*I)*b^2*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] - (2*I)*b^2
*PolyLog[2, I*E^(I*ArcSin[c*x])]*Sin[2*ArcSin[c*x]] - I*b^2*PolyLog[2, E^((
2*I)*ArcSin[c*x])]*Sin[2*ArcSin[c*x]]))/(4*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e
*x])
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
[Out] int((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="fricas")
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqrt
(-c*e*x + e)/(c^4*d^2*e^2*x^6 - 2*c^2*d^2*e^2*x^4 + d^2*e^2*x^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{\left(a+b\operatorname{asin}\left(cx\right)\right)^2}{x^2\left(d\left(cx+1\right)\right)^{\frac{3}{2}}\left(-e\left(cx-1\right)\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/x**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(x**2*(d*(c*x + 1))**(3/2)*(-e*(c*x - 1))**(3
/2)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(cdx+d\right)^{\frac{3}{2}}\left(-cex+e\right)^{\frac{3}{2}}x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/x^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algor
ithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*x^2),
 x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{x^2(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx=\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{x^2\,{\left(d+c\,d\,x\right)}^{3/2}\,{\left(e-c\,e\,x\right)}^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x)
[Out] int((a + b*asin(c*x))^2/(x^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)), x)
```

3.596 $\int x^4(d+ex^2)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 152

$$\int x^4(d+ex^2)(a+b\arcsin(cx))\,dx=\frac{b(7c^2d+5e)\sqrt{1-c^2x^2}}{35c^7}-\frac{b(14c^2d+15e)(1-c^2x^2)^{3/2}}{105c^7}+\frac{b(7c^2d+15e)(1-c^2x^2)^{5/2}}{175c^7}-\frac{be(1-c^2x^2)^{7/2}}{49c^7}+\frac{1}{5}dx^5(a+b\arcsin(cx))+\frac{1}{7}ex^7(a+b\arcsin(cx))$$

```
[Out] -1/105*b*(14*c^2*d+15*e)*(-c^2*x^2+1)^(3/2)/c^7+1/175*b*(7*c^2*d+15*e)*(-c^
2*x^2+1)^(5/2)/c^7-1/49*b*e*(-c^2*x^2+1)^(7/2)/c^7+1/5*d*x^5*(a+b*arcsin(c*
x))+1/7*e*x^7*(a+b*arcsin(c*x))+1/35*b*(7*c^2*d+5*e)*(-c^2*x^2+1)^(1/2)/c^7
```

Rubi [A] (verified)

Time = 0.11 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {14, 4815, 12, 457, 78}

$$\int x^4(d+ex^2)(a+b\arcsin(cx))\,dx=\frac{1}{5}dx^5(a+b\arcsin(cx))+\frac{1}{7}ex^7(a+b\arcsin(cx))+\frac{b(1-c^2x^2)^{5/2}(7c^2d+15e)}{175c^7}-\frac{b(1-c^2x^2)^{3/2}(14c^2d+15e)}{105c^7}+\frac{b\sqrt{1-c^2x^2}(7c^2d+5e)}{35c^7}-\frac{be(1-c^2x^2)^{7/2}}{49c^7}$$

```
[In] Int[x^4*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(7*c^2*d + 5*e)*Sqrt[1 - c^2*x^2])/(35*c^7) - (b*(14*c^2*d + 15*e)*(1 -
c^2*x^2)^(3/2))/(105*c^7) + (b*(7*c^2*d + 15*e)*(1 - c^2*x^2)^(5/2))/(175*c
^7) - (b*e*(1 - c^2*x^2)^(7/2))/(49*c^7) + (d*x^5*(a + b*ArcSin[c*x]))/5 +
(e*x^7*(a + b*ArcSin[c*x]))/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{1}{5}dx^5(a+b\arcsin(cx))+\frac{1}{7}ex^7(a+b\arcsin(cx))-(bc)\int\frac{x^5(7d+5ex^2)}{35\sqrt{1-c^2x^2}}\,dx\\ &= \frac{1}{5}dx^5(a+b\arcsin(cx))+\frac{1}{7}ex^7(a+b\arcsin(cx))-\frac{1}{35}(bc)\int\frac{x^5(7d+5ex^2)}{\sqrt{1-c^2x^2}}\,dx\end{aligned}$$

$$= \frac{1}{5}dx^5(a+b\arcsin(cx))+\frac{1}{7}ex^7(a+b\arcsin(cx))-\frac{1}{70}(bc)\text{Subst}\left(\int\frac{x^2(7d+5ex)}{\sqrt{1-c^2x}}\,dx,x,x^2\right)$$

$$= \frac{1}{5}dx^5(a+b\arcsin(cx))+\frac{1}{7}ex^7(a+b\arcsin(cx))-\frac{1}{70}(bc)\text{Subst}\left(\int\left(\frac{7c^2d+5e}{c^6\sqrt{1-c^2x}}+\frac{(-14c^2d-15e)\sqrt{1-c^2x}}{c^6}+\frac{(7c^2d+15e)(1-c^2x)^{3/2}}{c^6}-\frac{5e(1-c^2x)^{5/2}}{c^6}\right)dx,x,x^2\right)$$

$$= \frac{b(7c^2d+5e)\sqrt{1-c^2x^2}}{35c^7}-\frac{b(14c^2d+15e)(1-c^2x^2)^{3/2}}{105c^7}+\frac{b(7c^2d+15e)(1-c^2x^2)^{5/2}}{175c^7}-\frac{be(1-c^2x^2)^{7/2}}{49c^7}+\frac{1}{5}dx^5(a+b\arcsin(cx))+\frac{1}{7}ex^7(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.76

$$\int x^4(d+ex^2)(a+b\arcsin(cx))\,dx = \frac{105ax^5(7d+5ex^2)+\frac{b\sqrt{1-c^2x^2}(240e+8c^2(49d+15ex^2)+2c^4(98dx^2+45ex^4)+3c^6(49dx^4+25ex^6))}{c^7}+105bx^5(7d+5ex^2)\,\text{arcsin}}{3675}$$

```
[In] Integrate[x^4*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (105*a*x^5*(7*d + 5*e*x^2) + (b*Sqrt[1 - c^2*x^2]*(240*e + 8*c^2*(49*d + 15
*e*x^2) + 2*c^4*(98*d*x^2 + 45*e*x^4) + 3*c^6*(49*d*x^4 + 25*e*x^6)))/c^7 +
 105*b*x^5*(7*d + 5*e*x^2)*ArcSin[c*x])/3675
```

Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.28

method	result
parts	$a\left(\frac{1}{7}e\,x^{7}+\frac{1}{5}d\,x^{5}\right)+\frac{b\left(\frac{c^{5}\arcsin(cx)e\,x^{7}}{7}+\frac{\arcsin(cx)c^{5}x^{5}d}{5}-\frac{5e\left(-\frac{c^{6}x^{6}\sqrt{-c^{2}x^{2}+1}}{7}-\frac{6c^{4}x^{4}\sqrt{-c^{2}x^{2}+1}}{35}-\frac{8c^{2}x^{2}\sqrt{-c^{2}x^{2}\cdots}}{35}\cdots\right.}{\cdots}\right.}{c^{5}}$
derivativedivides	$\frac{\frac{a\left(\frac{1}{5}d\,c^{7}x^{5}+\frac{1}{7}e\,c^{7}x^{7}\right)}{c^{2}}+\frac{b\left(\frac{\arcsin(cx)d\,c^{7}x^{5}}{5}+\frac{\arcsin(cx)e\,c^{7}x^{7}}{7}-\frac{e\left(-\frac{c^{6}x^{6}\sqrt{-c^{2}x^{2}+1}}{7}-\frac{6c^{4}x^{4}\sqrt{-c^{2}x^{2}+1}}{35}-\frac{8c^{2}x^{2}\sqrt{-c^{2}x^{2}+1}}{35}-16\cdots\right.}{7}\cdots\right.}{c^{2}}}{c^{5}}$
default	$\frac{\frac{a\left(\frac{1}{5}d\,c^{7}x^{5}+\frac{1}{7}e\,c^{7}x^{7}\right)}{c^{2}}+\frac{b\left(\frac{\arcsin(cx)d\,c^{7}x^{5}}{5}+\frac{\arcsin(cx)e\,c^{7}x^{7}}{7}-\frac{e\left(-\frac{c^{6}x^{6}\sqrt{-c^{2}x^{2}+1}}{7}-\frac{6c^{4}x^{4}\sqrt{-c^{2}x^{2}+1}}{35}-\frac{8c^{2}x^{2}\sqrt{-c^{2}x^{2}+1}}{35}-16\cdots\right.}{7}\cdots\right.}{c^{2}}}{c^{5}}$

```
[In] int(x^4*(e*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/7*e*x^7+1/5*d*x^5)+b/c^5*(1/7*c^5*arcsin(c*x)*e*x^7+1/5*arcsin(c*x)*c^
5*x^5*d-1/35/c^2*(5*e*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x
^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2))+7*d*c
^2*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-
c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 128, normalized size of antiderivative = 0.84

$$\int x^4\left(d+ex^2\right)(a+b\arcsin(cx))\,dx$$
$$=\frac{525\,ac^7ex^7+735\,ac^7dx^5+105\,(5\,bc^7ex^7+7\,bc^7dx^5)\arcsin{(cx)}+(75\,bc^6ex^6+3\,(49\,bc^6d+30\,bc^4e)x^4+3\cdots}{3675\,c^7}$$

```
[In] integrate(x^4*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/3675*(525*a*c^7*e*x^7 + 735*a*c^7*d*x^5 + 105*(5*b*c^7*e*x^7 + 7*b*c^7*d*
x^5)*arcsin(c*x) + (75*b*c^6*e*x^6 + 3*(49*b*c^6*d + 30*b*c^4*e)*x^4 + 392*
b*c^2*d + 4*(49*b*c^4*d + 30*b*c^2*e)*x^2 + 240*b*e)*sqrt(-c^2*x^2 + 1))/c^
7
```

Sympy [A] (verification not implemented)

Time = 0.71 (sec) , antiderivative size = 223, normalized size of antiderivative = 1.47

$$\int x^4(d+ex^2)(a+b\arcsin(cx))\,dx$$
$$= \begin{cases} \frac{adx^5}{5} + \frac{aex^7}{7} + \frac{bdx^5\operatorname{asin}(cx)}{5} + \frac{bex^7\operatorname{asin}(cx)}{7} + \frac{bdx^4\sqrt{-c^2x^2+1}}{25c} + \frac{bex^6\sqrt{-c^2x^2+1}}{49c} + \frac{4bdx^2\sqrt{-c^2x^2+1}}{75c^3} + \frac{6bex^4\sqrt{-c^2x^2+1}}{245c^3} + \frac{8b}{} \\ a\left(\frac{dx^5}{5} + \frac{ex^7}{7}\right) \end{cases}$$

```
[In] integrate(x**4*(e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*x**5/5 + a*e*x**7/7 + b*d*x**5*asin(c*x)/5 + b*e*x**7*asin(c
*x)/7 + b*d*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*e*x**6*sqrt(-c**2*x**2 + 1
)/(49*c) + 4*b*d*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 6*b*e*x**4*sqrt(-c**
2*x**2 + 1)/(245*c**3) + 8*b*d*sqrt(-c**2*x**2 + 1)/(75*c**5) + 8*b*e*x**2*
sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e*sqrt(-c**2*x**2 + 1)/(245*c**7), N
e(c, 0)), (a*(d*x**5/5 + e*x**7/7), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.20

$$\int x^4(d+ex^2)(a+b\arcsin(cx))\,dx = \frac{1}{7}aex^7 + \frac{1}{5}adx^5$$
$$+ \frac{1}{75}\left(15x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd$$
$$+ \frac{1}{245}\left(35x^7\arcsin(cx) + \left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2} + \frac{6\sqrt{-c^2x^2+1}x^4}{c^4} + \frac{8\sqrt{-c^2x^2+1}x^2}{c^6} + \frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right.$$

```
[In] integrate(x^4*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/7*a*e*x^7 + 1/5*a*d*x^5 + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1
)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d
 + 1/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*
x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8
)*c)*b*e
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 316 vs. $2(132) = 264$.

Time = 0.30 (sec) , antiderivative size = 316, normalized size of antiderivative = 2.08

$$\int x^4(d+ex^2)(a+b\arcsin(cx))\,dx = \frac{1}{7}aex^7 + \frac{1}{5}adx^5 + \frac{(c^2x^2-1)^2bdx\arcsin(cx)}{5c^4} + \frac{2(c^2x^2-1)bdx\arcsin(cx)}{5c^4} + \frac{(c^2x^2-1)^3bex\arcsin(cx)}{7c^6} + \frac{bdx\arcsin(cx)}{5c^4} + \frac{3(c^2x^2-1)^2bex\arcsin(cx)}{7c^6} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}bd}{25c^5} + \frac{3(c^2x^2-1)bex\arcsin(cx)}{7c^6} - \frac{2(-c^2x^2+1)^{\frac{3}{2}}bd}{15c^5} + \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}be}{49c^7} + \frac{bex\arcsin(cx)}{7c^6} + \frac{\sqrt{-c^2x^2+1}bd}{5c^5} + \frac{3(c^2x^2-1)^2\sqrt{-c^2x^2+1}be}{35c^7} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be}{7c^7} + \frac{\sqrt{-c^2x^2+1}be}{7c^7}$$

```
[In] integrate(x^4*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/7*a*e*x^7 + 1/5*a*d*x^5 + 1/5*(c^2*x^2 - 1)^2*b*d*x*arcsin(c*x)/c^4 + 2/5
*(c^2*x^2 - 1)*b*d*x*arcsin(c*x)/c^4 + 1/7*(c^2*x^2 - 1)^3*b*e*x*arcsin(c*x
)/c^6 + 1/5*b*d*x*arcsin(c*x)/c^4 + 3/7*(c^2*x^2 - 1)^2*b*e*x*arcsin(c*x)/c
^6 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d/c^5 + 3/7*(c^2*x^2 - 1)*b*
e*x*arcsin(c*x)/c^6 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*d/c^5 + 1/49*(c^2*x^2 - 1
)^3*sqrt(-c^2*x^2 + 1)*b*e/c^7 + 1/7*b*e*x*arcsin(c*x)/c^6 + 1/5*sqrt(-c^2*
x^2 + 1)*b*d/c^5 + 3/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e/c^7 - 1/7*(-
c^2*x^2 + 1)^(3/2)*b*e/c^7 + 1/7*sqrt(-c^2*x^2 + 1)*b*e/c^7
```

Mupad [F(-1)]

Timed out.

$$\int x^4(d+ex^2)\,(a+b\arcsin(cx))\,dx=\int x^4\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)\,dx$$

```
[In] int(x^4*(a + b*asin(c*x))*(d + e*x^2),x)
[Out] int(x^4*(a + b*asin(c*x))*(d + e*x^2), x)
```

3.597 $\int x^3(d+ex^2)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 149

$$\int x^3\left(d+ex^2\right)(a+b\arcsin(cx))\,dx=\frac{b(9c^2d+5e)\,x\sqrt{1-c^2x^2}}{96c^5}+\frac{b(9c^2d+5e)\,x^3\sqrt{1-c^2x^2}}{144c^3}+\frac{bex^5\sqrt{1-c^2x^2}}{36c}-\frac{b(9c^2d+5e)\arcsin(cx)}{96c^6}+\frac{1}{4}dx^4(a+b\arcsin(cx))+\frac{1}{6}ex^6(a+b\arcsin(cx))$$

```
[Out] -1/96*b*(9*c^2*d+5*e)*arcsin(c*x)/c^6+1/4*d*x^4*(a+b*arcsin(c*x))+1/6*e*x^6
*(a+b*arcsin(c*x))+1/96*b*(9*c^2*d+5*e)*x*(-c^2*x^2+1)^(1/2)/c^5+1/144*b*(9
*c^2*d+5*e)*x^3*(-c^2*x^2+1)^(1/2)/c^3+1/36*b*e*x^5*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.08 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {14, 4815, 12, 470, 327, 222}

$$\int x^3\left(d+ex^2\right)(a+b\arcsin(cx))\,dx=\frac{1}{4}dx^4(a+b\arcsin(cx))+\frac{1}{6}ex^6(a+b\arcsin(cx))-\frac{b\arcsin(cx)\left(9c^2d+5e\right)}{96c^6}+\frac{bex^5\sqrt{1-c^2x^2}}{36c}+\frac{bx\sqrt{1-c^2x^2}(9c^2d+5e)}{96c^5}+\frac{bx^3\sqrt{1-c^2x^2}(9c^2d+5e)}{144c^3}$$

```
[In] Int[x^3*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(9*c^2*d + 5*e)*x*Sqrt[1 - c^2*x^2])/(96*c^5) + (b*(9*c^2*d + 5*e)*x^3*S
qrt[1 - c^2*x^2])/(144*c^3) + (b*e*x^5*Sqrt[1 - c^2*x^2])/(36*c) - (b*(9*c^
2*d + 5*e)*ArcSin[c*x])/(96*c^6) + (d*x^4*(a + b*ArcSin[c*x]))/4 + (e*x^6*(
a + b*ArcSin[c*x]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{4}dx^4(a+b\arcsin(cx))+\frac{1}{6}ex^6(a+b\arcsin(cx))-(bc)\int\frac{x^4(3d+2ex^2)}{12\sqrt{1-c^2x^2}}\,dx\\
&= \frac{1}{4}dx^4(a+b\arcsin(cx))+\frac{1}{6}ex^6(a+b\arcsin(cx))-\frac{1}{12}(bc)\int\frac{x^4(3d+2ex^2)}{\sqrt{1-c^2x^2}}\,dx\\
&= \frac{bex^5\sqrt{1-c^2x^2}}{36c}+\frac{1}{4}dx^4(a+b\arcsin(cx))+\frac{1}{6}ex^6(a+b\arcsin(cx))\\
&\quad -\frac{1}{36}\left(bc\left(9d+\frac{5e}{c^2}\right)\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx\\
&= \frac{b(9c^2d+5e)\,x^3\sqrt{1-c^2x^2}}{144c^3}+\frac{bex^5\sqrt{1-c^2x^2}}{36c}+\frac{1}{4}dx^4(a+b\arcsin(cx))\\
&\quad +\frac{1}{6}ex^6(a+b\arcsin(cx))-\frac{(b(9c^2d+5e))\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{48c^3}\\
&= \frac{b(9c^2d+5e)\,x\sqrt{1-c^2x^2}}{96c^5}+\frac{b(9c^2d+5e)\,x^3\sqrt{1-c^2x^2}}{144c^3}+\frac{bex^5\sqrt{1-c^2x^2}}{36c}\\
&\quad +\frac{1}{4}dx^4(a+b\arcsin(cx))+\frac{1}{6}ex^6(a+b\arcsin(cx))-\frac{(b(9c^2d+5e))\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{96c^5}\\
&= \frac{b(9c^2d+5e)\,x\sqrt{1-c^2x^2}}{96c^5}+\frac{b(9c^2d+5e)\,x^3\sqrt{1-c^2x^2}}{144c^3}+\frac{bex^5\sqrt{1-c^2x^2}}{36c}\\
&\quad -\frac{b(9c^2d+5e)\arcsin(cx)}{96c^6}+\frac{1}{4}dx^4(a+b\arcsin(cx))+\frac{1}{6}ex^6(a+b\arcsin(cx))
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 116, normalized size of antiderivative = 0.78

$$\int x^3\left(d+ex^2\right)(a+b\arcsin(cx))\,dx$$
$$=\frac{24ac^6x^4(3d+2ex^2)+bcx\sqrt{1-c^2x^2}(15e+c^2(27d+10ex^2)+2c^4(9dx^2+4ex^4))+3b(-9c^2d-5e+8c^6(}{288c^6}$$

```
[In] Integrate[x^3*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (24*a*c^6*x^4*(3*d + 2*e*x^2) + b*c*x*Sqrt[1 - c^2*x^2]*(15*e + c^2*(27*d +
 10*e*x^2) + 2*c^4*(9*d*x^2 + 4*e*x^4)) + 3*b*(-9*c^2*d - 5*e + 8*c^6*(3*d*
x^4 + 2*e*x^6))*ArcSin[c*x])/(288*c^6)
```

Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.14

method	result
parts	$a\left(\frac{1}{6}e\,x^{6}+\frac{1}{4}d\,x^{4}\right)+\frac{b\left(\frac{c^{4}\arcsin(cx)e\,x^{6}}{6}+\frac{\arcsin(cx)c^{4}x^{4}d}{4}-\frac{2e\left(-\frac{c^{5}x^{5}\sqrt{-c^{2}x^{2}+1}}{6}-\frac{5c^{3}x^{3}\sqrt{-c^{2}x^{2}+1}}{24}-\frac{5cx\sqrt{-c^{2}x^{2}+1}}{16}+\right.}{}\right.}{c^{4}}$
derivativedivides	$\frac{\frac{a\left(\frac{1}{4}d\,c^{6}x^{4}+\frac{1}{6}e\,c^{6}x^{6}\right)}{c^{2}}+\frac{b\left(\frac{\arcsin(cx)d\,c^{6}x^{4}}{4}+\frac{\arcsin(cx)e\,c^{6}x^{6}}{6}-\frac{e\left(-\frac{c^{5}x^{5}\sqrt{-c^{2}x^{2}+1}}{6}-\frac{5c^{3}x^{3}\sqrt{-c^{2}x^{2}+1}}{24}-\frac{5cx\sqrt{-c^{2}x^{2}+1}}{16}+\frac{5\arcsin}{16}\right.}{6}\right.}{c^{2}}}{c^{4}}$
default	$\frac{\frac{a\left(\frac{1}{4}d\,c^{6}x^{4}+\frac{1}{6}e\,c^{6}x^{6}\right)}{c^{2}}+\frac{b\left(\frac{\arcsin(cx)d\,c^{6}x^{4}}{4}+\frac{\arcsin(cx)e\,c^{6}x^{6}}{6}-\frac{e\left(-\frac{c^{5}x^{5}\sqrt{-c^{2}x^{2}+1}}{6}-\frac{5c^{3}x^{3}\sqrt{-c^{2}x^{2}+1}}{24}-\frac{5cx\sqrt{-c^{2}x^{2}+1}}{16}+\frac{5\arcsin}{16}\right.}{6}\right.}{c^{2}}}{c^{4}}$

```
[In] int(x^3*(e*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/6*e*x^6+1/4*d*x^4)+b/c^4*(1/6*c^4*arcsin(c*x)*e*x^6+1/4*arcsin(c*x)*c^
4*x^4*d-1/12/c^2*(2*e*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x
^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))+3*d*c^2*(-1/4*c^3
*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 124, normalized size of antiderivative = 0.83

$$\int x^{3}\left(d+ex^{2}\right)\left(a+b\arcsin(cx)\right)dx$$
$$=\frac{48\,ac^{6}ex^{6}+72\,ac^{6}dx^{4}+3\left(16\,bc^{6}ex^{6}+24\,bc^{6}dx^{4}-9\,bc^{2}d-5\,be\right)\arcsin\left(cx\right)+\left(8\,bc^{5}ex^{5}+2\left(9\,bc^{5}d+5\,bc^{3}\right.\right.}{288\,c^{6}}$$

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/288*(48*a*c^6*e*x^6 + 72*a*c^6*d*x^4 + 3*(16*b*c^6*e*x^6 + 24*b*c^6*d*x^4
 - 9*b*c^2*d - 5*b*e)*arcsin(c*x) + (8*b*c^5*e*x^5 + 2*(9*b*c^5*d + 5*b*c^3
*e)*x^3 + 3*(9*b*c^3*d + 5*b*c*e)*x)*sqrt(-c^2*x^2 + 1))/c^6
```

Sympy [A] (verification not implemented)

Time = 0.50 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.38

$$\int x^3(d+ex^2)(a+b\arcsin(cx))\,dx$$
$$=\begin{cases}\frac{adx^4}{4}+\frac{aex^6}{6}+\frac{bdx^4\operatorname{asin}(cx)}{4}+\frac{bex^6\operatorname{asin}(cx)}{6}+\frac{bdx^3\sqrt{-c^2x^2+1}}{16c}+\frac{bex^5\sqrt{-c^2x^2+1}}{36c}+\frac{3bdx\sqrt{-c^2x^2+1}}{32c^3}+\frac{5bex^3\sqrt{-c^2x^2+1}}{144c^3}-3b \\ a\left(\frac{dx^4}{4}+\frac{ex^6}{6}\right)\end{cases}$$

```
[In] integrate(x**3*(e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*x**4/4 + a*e*x**6/6 + b*d*x**4*asin(c*x)/4 + b*e*x**6*asin(c
*x)/6 + b*d*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*e*x**5*sqrt(-c**2*x**2 + 1
)/(36*c) + 3*b*d*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 5*b*e*x**3*sqrt(-c**2*x
**2 + 1)/(144*c**3) - 3*b*d*asin(c*x)/(32*c**4) + 5*b*e*x*sqrt(-c**2*x**2 +
 1)/(96*c**5) - 5*b*e*asin(c*x)/(96*c**6), Ne(c, 0)), (a*(d*x**4/4 + e*x**6
/6), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.09

$$\int x^3(d+ex^2)(a+b\arcsin(cx))\,dx=\frac{1}{6}aex^6+\frac{1}{4}adx^4$$
$$+\frac{1}{32}\left(8x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\arcsin(cx)}{c^5}\right)c\right)bd$$
$$+\frac{1}{288}\left(48x^6\arcsin(cx)+\left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2}+\frac{10\sqrt{-c^2x^2+1}x^3}{c^4}+\frac{15\sqrt{-c^2x^2+1}x}{c^6}-\frac{15\arcsin(cx)}{c^7}\right)\right.$$

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/6*a*e*x^6 + 1/4*a*d*x^4 + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)
*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d + 1/288*(
48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*
x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*e
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 254, normalized size of antiderivative = 1.70

$$\int x^3(d+ex^2)\,(a+b\arcsin(cx))\,dx = \frac{1}{6}\,aex^6 + \frac{1}{4}\,adx^4 - \frac{(-c^2x^2+1)^{\frac{3}{2}}bdx}{16\,c^3} + \frac{(c^2x^2-1)^2bd\arcsin(cx)}{4\,c^4} + \frac{5\,\sqrt{-c^2x^2+1}bdx}{32\,c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}bex}{36\,c^5} + \frac{(c^2x^2-1)bd\arcsin(cx)}{2\,c^4} + \frac{(c^2x^2-1)^3be\arcsin(cx)}{6\,c^6} - \frac{13\,(-c^2x^2+1)^{\frac{3}{2}}bex}{144\,c^5} + \frac{5\,bd\arcsin(cx)}{32\,c^4} + \frac{(c^2x^2-1)^2be\arcsin(cx)}{2\,c^6} + \frac{11\,\sqrt{-c^2x^2+1}bex}{96\,c^5} + \frac{(c^2x^2-1)be\arcsin(cx)}{2\,c^6} + \frac{11\,be\arcsin(cx)}{96\,c^6}$$

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] 1/6*a*e*x^6 + 1/4*a*d*x^4 - 1/16*(-c^2*x^2 + 1)^(3/2)*b*d*x/c^3 + 1/4*(c^2*
x^2 - 1)^2*b*d*arcsin(c*x)/c^4 + 5/32*sqrt(-c^2*x^2 + 1)*b*d*x/c^3 + 1/36*(
c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e*x/c^5 + 1/2*(c^2*x^2 - 1)*b*d*arcsin(
c*x)/c^4 + 1/6*(c^2*x^2 - 1)^3*b*e*arcsin(c*x)/c^6 - 13/144*(-c^2*x^2 + 1)^
(3/2)*b*e*x/c^5 + 5/32*b*d*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^2*b*e*arcsin
(c*x)/c^6 + 11/96*sqrt(-c^2*x^2 + 1)*b*e*x/c^5 + 1/2*(c^2*x^2 - 1)*b*e*arcs
in(c*x)/c^6 + 11/96*b*e*arcsin(c*x)/c^6
```

Mupad [F(-1)]

Timed out.

$$\int x^3(d+ex^2)\,(a+b\arcsin(cx))\,dx = \int x^3\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)\,dx$$

```
[In] int(x^3*(a + b*asin(c*x))*(d + e*x^2),x)
[Out] int(x^3*(a + b*asin(c*x))*(d + e*x^2), x)
```

3.598 $\int x^2(d+ex^2)\,(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 120

$$\int x^2(d+ex^2)\,(a+b\arcsin(cx))\,dx = \frac{b(5c^2d+3e)\sqrt{1-c^2x^2}}{15c^5} - \frac{b(5c^2d+6e)\,(1-c^2x^2)^{3/2}}{45c^5} + \frac{be(1-c^2x^2)^{5/2}}{25c^5} + \frac{1}{3}dx^3(a+b\arcsin(cx)) + \frac{1}{5}ex^5(a+b\arcsin(cx))$$

```
[Out] -1/45*b*(5*c^2*d+6*e)*(-c^2*x^2+1)^(3/2)/c^5+1/25*b*e*(-c^2*x^2+1)^(5/2)/c^
5+1/3*d*x^3*(a+b*arcsin(c*x))+1/5*e*x^5*(a+b*arcsin(c*x))+1/15*b*(5*c^2*d+3
*e)*(-c^2*x^2+1)^(1/2)/c^5
```

Rubi [A] (verified)

Time = 0.09 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {14, 4815, 12, 457, 78}

$$\int x^2(d+ex^2)\,(a+b\arcsin(cx))\,dx = \frac{1}{3}dx^3(a+b\arcsin(cx)) + \frac{1}{5}ex^5(a+b\arcsin(cx)) - \frac{b(1-c^2x^2)^{3/2}\,(5c^2d+6e)}{45c^5} + \frac{b\sqrt{1-c^2x^2}(5c^2d+3e)}{15c^5} + \frac{be(1-c^2x^2)^{5/2}}{25c^5}$$

```
[In] Int[x^2*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(5*c^2*d + 3*e)*Sqrt[1 - c^2*x^2])/(15*c^5) - (b*(5*c^2*d + 6*e)*(1 - c^
2*x^2)^(3/2))/(45*c^5) + (b*e*(1 - c^2*x^2)^(5/2))/(25*c^5) + (d*x^3*(a + b
*ArcSin[c*x]))/3 + (e*x^5*(a + b*ArcSin[c*x]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\text{integral} = \frac{1}{3}dx^3(a+b\arcsin(cx)) + \frac{1}{5}ex^5(a+b\arcsin(cx)) - (bc)\int \frac{x^3(5d+3ex^2)}{15\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{1}{3}dx^3(a+b\arcsin(cx)) + \frac{1}{5}ex^5(a+b\arcsin(cx)) - \frac{1}{15}(bc)\int \frac{x^3(5d+3ex^2)}{\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{1}{3}dx^3(a+b\arcsin(cx))+\frac{1}{5}ex^5(a+b\arcsin(cx))-\frac{1}{30}(bc)\text{Subst}\left(\int \frac{x(5d+3ex)}{\sqrt{1-c^2x}}\,dx,x,x^2\right)$$

$$= \frac{1}{3}dx^3(a+b\arcsin(cx))+\frac{1}{5}ex^5(a+b\arcsin(cx))-\frac{1}{30}(bc)\text{Subst}\left(\int\left(\frac{5c^2d+3e}{c^4\sqrt{1-c^2x}}+\frac{(-5c^2d-6e)\sqrt{1-c^2x}}{c^4}+\frac{3e(1-c^2x)^{3/2}}{c^4}\right)dx,x,x^2\right)$$

$$= \frac{b(5c^2d+3e)\sqrt{1-c^2x^2}}{15c^5}-\frac{b(5c^2d+6e)(1-c^2x^2)^{3/2}}{45c^5}+\frac{be(1-c^2x^2)^{5/2}}{25c^5}+\frac{1}{3}dx^3(a+b\arcsin(cx))+\frac{1}{5}ex^5(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.80

$$\int x^2(d+ex^2)(a+b\arcsin(cx))\,dx = \frac{1}{225}\left(15ax^3(5d+3ex^2)+\frac{b\sqrt{1-c^2x^2}(24e+2c^2(25d+6ex^2)+c^4(25dx^2+9ex^4))}{c^5}+15bx^3(5d+3ex^2)\arcsin(cx)\right)$$

```
[In] Integrate[x^2*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (15*a*x^3*(5*d + 3*e*x^2) + (b*Sqrt[1 - c^2*x^2]*(24*e + 2*c^2*(25*d + 6*e*
x^2) + c^4*(25*d*x^2 + 9*e*x^4)))/c^5 + 15*b*x^3*(5*d + 3*e*x^2)*ArcSin[c*x
])/225
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.28

method	result
parts	$a\left(\frac{1}{5}e\,x^5+\frac{1}{3}d\,x^3\right)+\frac{b\left(\frac{c^3\arcsin(cx)e\,x^5}{5}+\frac{\arcsin(cx)d\,c^3x^3}{3}-\frac{3e\left(-\frac{c^4x^4\sqrt{-c^2x^2+1}}{5}-\frac{4c^2x^2\sqrt{-c^2x^2+1}}{15}-\frac{8\sqrt{-c^2x^2+1}}{15}\right)+5}{15c^2}\right.}{c^3}$
derivativedivides	$\frac{\frac{a\left(\frac{1}{3}d\,c^5x^3+\frac{1}{5}e\,c^5x^5\right)}{c^2}+\frac{b\left(\frac{\arcsin(cx)d\,c^5x^3}{3}+\frac{\arcsin(cx)e\,c^5x^5}{5}-\frac{e\left(-\frac{c^4x^4\sqrt{-c^2x^2+1}}{5}-\frac{4c^2x^2\sqrt{-c^2x^2+1}}{15}-\frac{8\sqrt{-c^2x^2+1}}{15}\right)}{5}-\frac{d\,c^2\left(-\right.}{}\right.}{c^2}}{c^3}$
default	$\frac{\frac{a\left(\frac{1}{3}d\,c^5x^3+\frac{1}{5}e\,c^5x^5\right)}{c^2}+\frac{b\left(\frac{\arcsin(cx)d\,c^5x^3}{3}+\frac{\arcsin(cx)e\,c^5x^5}{5}-\frac{e\left(-\frac{c^4x^4\sqrt{-c^2x^2+1}}{5}-\frac{4c^2x^2\sqrt{-c^2x^2+1}}{15}-\frac{8\sqrt{-c^2x^2+1}}{15}\right)}{5}-\frac{d\,c^2\left(-\right.}{}\right.}{c^2}}{c^3}$

```
[In] int(x^2*(e*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/5*e*x^5+1/3*d*x^3)+b/c^3*(1/5*c^3*arcsin(c*x)*e*x^5+1/3*arcsin(c*x)*d*
c^3*x^3-1/15/c^2*(3*e*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x
^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))+5*d*c^2*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/
2)-2/3*(-c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.89

$$\int x^2\left(d+ex^2\right)\left(a+b\arcsin(cx)\right)dx$$
$$=\frac{45\,ac^5ex^5+75\,ac^5dx^3+15\left(3\,bc^5ex^5+5\,bc^5dx^3\right)\arcsin\left(cx\right)+\left(9\,bc^4ex^4+50\,bc^2d+\left(25\,bc^4d+12\,bc^2e\right)x^2+\right.}{225\,c^5}$$

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/225*(45*a*c^5*e*x^5 + 75*a*c^5*d*x^3 + 15*(3*b*c^5*e*x^5 + 5*b*c^5*d*x^3)
*arcsin(c*x) + (9*b*c^4*e*x^4 + 50*b*c^2*d + (25*b*c^4*d + 12*b*c^2*e)*x^2
+ 24*b*e)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] (verification not implemented)

Time = 0.40 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.43

$$\int x^2\left(d+ex^2\right)\left(a+b\arcsin(cx)\right)dx$$
$$=\begin{cases}\frac{adx^3}{3}+\frac{aex^5}{5}+\frac{bdx^3\,\mathrm{asin}\,(cx)}{3}+\frac{bex^5\,\mathrm{asin}\,(cx)}{5}+\frac{bdx^2\sqrt{-c^2x^2+1}}{9c}+\frac{bex^4\sqrt{-c^2x^2+1}}{25c}+\frac{2bd\sqrt{-c^2x^2+1}}{9c^3}+\frac{4bex^2\sqrt{-c^2x^2+1}}{75c^3}+\frac{8be\sqrt{}}{} \\ a\left(\frac{dx^3}{3}+\frac{ex^5}{5}\right)\end{cases}$$

```
[In] integrate(x**2*(e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*x**3/3 + a*e*x**5/5 + b*d*x**3*asin(c*x)/3 + b*e*x**5*asin(c
*x)/5 + b*d*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e*x**4*sqrt(-c**2*x**2 + 1)
/(25*c) + 2*b*d*sqrt(-c**2*x**2 + 1)/(9*c**3) + 4*b*e*x**2*sqrt(-c**2*x**2
+ 1)/(75*c**3) + 8*b*e*sqrt(-c**2*x**2 + 1)/(75*c**5), Ne(c, 0)), (a*(d*x**
3/3 + e*x**5/5), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.18

$$\int x^2(d+ex^2)(a+b\arcsin(cx))\,dx = \frac{1}{5}\,aex^5 + \frac{1}{3}\,adx^3 + \frac{1}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd + \frac{1}{75}\left(15\,x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be$$

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*e*x^5 + 1/3*a*d*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*
x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d + 1/75*(15*x^5*arcsin(c*x) + (3*sq
rt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 +
 1)/c^6)*c)*b*e
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 210 vs. 2(104) = 208.

Time = 0.31 (sec) , antiderivative size = 210, normalized size of antiderivative = 1.75

$$\int x^2(d+ex^2)(a+b\arcsin(cx))\,dx = \frac{1}{5}\,aex^5 + \frac{1}{3}\,adx^3 + \frac{(c^2x^2-1)bdx\arcsin(cx)}{3\,c^2} + \frac{bdx\arcsin(cx)}{3\,c^2} + \frac{(c^2x^2-1)^2bex\arcsin(cx)}{5\,c^4} + \frac{2\,(c^2x^2-1)bex\arcsin(cx)}{5\,c^4} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bd}{9\,c^3} + \frac{bex\arcsin(cx)}{5\,c^4} + \frac{\sqrt{-c^2x^2+1}bd}{3\,c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}be}{25\,c^5} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}be}{15\,c^5} + \frac{\sqrt{-c^2x^2+1}be}{5\,c^5}$$

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/5*a*e*x^5 + 1/3*a*d*x^3 + 1/3*(c^2*x^2 - 1)*b*d*x*arcsin(c*x)/c^2 + 1/3*b
*d*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*e*x*arcsin(c*x)/c^4 + 2/5*(c^2
*x^2 - 1)*b*e*x*arcsin(c*x)/c^4 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d/c^3 + 1/5*b*
e*x*arcsin(c*x)/c^4 + 1/3*sqrt(-c^2*x^2 + 1)*b*d/c^3 + 1/25*(c^2*x^2 - 1)^2
*sqrt(-c^2*x^2 + 1)*b*e/c^5 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*e/c^5 + 1/5*sqrt(
-c^2*x^2 + 1)*b*e/c^5
```

Mupad [F(-1)]

Timed out.

$$\int x^2(d+ex^2)\,(a+b\arcsin(cx))\,dx=\int x^2\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)\,dx$$

```
[In] int(x^2*(a + b*asin(c*x))*(d + e*x^2),x)
```

```
[Out] int(x^2*(a + b*asin(c*x))*(d + e*x^2), x)
```

3.599 $\int x(d+ex^2)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 17, antiderivative size = 122

$$\int x(d+ex^2)(a+b\arcsin(cx))\,dx = \frac{3b(2c^2d+e)\,x\sqrt{1-c^2x^2}}{32c^3}+\frac{bx\sqrt{1-c^2x^2}(d+ex^2)}{16c}-\frac{b(8c^4d^2+8c^2de+3e^2)\arcsin(cx)}{32c^4e}+\frac{(d+ex^2)^2(a+b\arcsin(cx))}{4e}$$

```
[Out] -1/32*b*(8*c^4*d^2+8*c^2*d*e+3*e^2)*arcsin(c*x)/c^4/e+1/4*(e*x^2+d)^2*(a+b*
arcsin(c*x))/e+3/32*b*(2*c^2*d+e)*x*(-c^2*x^2+1)^(1/2)/c^3+1/16*b*x*(e*x^2+
d)*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235, Rules used = {4813, 427, 396, 222}

$$\int x(d+ex^2)(a+b\arcsin(cx))\,dx = \frac{(d+ex^2)^2(a+b\arcsin(cx))}{4e}-\frac{b\arcsin(cx)\,(8c^4d^2+8c^2de+3e^2)}{32c^4e}+\frac{bx\sqrt{1-c^2x^2}(d+ex^2)}{16c}+\frac{3bx\sqrt{1-c^2x^2}(2c^2d+e)}{32c^3}$$

```
[In] Int[x*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3*b*(2*c^2*d + e)*x*Sqrt[1 - c^2*x^2])/(32*c^3) + (b*x*Sqrt[1 - c^2*x^2]*(
d + e*x^2))/(16*c) - (b*(8*c^4*d^2 + 8*c^2*d*e + 3*e^2)*ArcSin[c*x])/(32*c^
4*e) + ((d + e*x^2)^2*(a + b*ArcSin[c*x]))/(4*e)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 427

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[d*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^(q - 1)/(b*(n*(p + q) + 1))),
x] + Dist[1/(b*(n*(p + q) + 1)), Int[(a + b*x^n)^p*(c + d*x^n)^(q - 2)*Simp
[c*(b*c*(n*(p + q) + 1) - a*d) + d*(b*c*(n*(p + 2*q - 1) + 1) - a*d*(n*(q -
 1) + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d,
 0] && GtQ[q, 1] && NeQ[n*(p + q) + 1, 0] &&  !IGtQ[p, 1] && IntBinomialQ[a
, b, c, d, n, p, q, x]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{(d+ex^2)^2(a+b\arcsin(cx))}{4e} - \frac{(bc)\int \frac{(d+ex^2)^2}{\sqrt{1-c^2x^2}}\,dx}{4e} \\
&= \frac{bx\sqrt{1-c^2x^2}(d+ex^2)}{16c} + \frac{(d+ex^2)^2(a+b\arcsin(cx))}{4e} + \frac{b\int \frac{-d(4c^2d+e)-3e(2c^2d+e)x^2}{\sqrt{1-c^2x^2}}\,dx}{16ce} \\
&= \frac{3b(2c^2d+e)\,x\sqrt{1-c^2x^2}}{32c^3} + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)}{16c} \\
&\quad + \frac{(d+ex^2)^2(a+b\arcsin(cx))}{4e} - \frac{(b(8c^4d^2+8c^2de+3e^2))\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{32c^3e}
\end{aligned}$$

$$= \frac{3b(2c^2d+e)\,x\sqrt{1-c^2x^2}}{32c^3} + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)}{16c} - \frac{b(8c^4d^2+8c^2de+3e^2)\arcsin(cx)}{32c^4e} + \frac{(d+ex^2)^2\,(a+b\arcsin(cx))}{4e}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.78

$$\int x\left(d+ex^2\right)(a+b\arcsin(cx))\,dx = \frac{cx\left(8ac^3x(2d+ex^2)+b\sqrt{1-c^2x^2}(3e+2c^2(4d+ex^2))\right)+b(-8c^2d-3e+8c^4(2dx^2+ex^4))\arcsin(cx)}{32c^4}$$

```
[In] Integrate[x*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (c*x*(8*a*c^3*x*(2*d + e*x^2) + b*Sqrt[1 - c^2*x^2]*(3*e + 2*c^2*(4*d + e*x
^2))) + b*(-8*c^2*d - 3*e + 8*c^4*(2*d*x^2 + e*x^4))*ArcSin[c*x])/(32*c^4)
```

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.32

method	result
parts	$\frac{a(e\,x^2+d)^2}{4e}+\frac{b\left(\frac{c^2e\arcsin(cx)x^4}{4}+\frac{\arcsin(cx)c^2x^2d}{2}+\frac{c^2\arcsin(cx)d^2}{4e}-\frac{c^4d^2\arcsin(cx)+e^2\left(-\frac{c^3x^3\sqrt{-c^2x^2+1}}{4}-\frac{3cx\sqrt{-c^2x^2+1}}{8}\cdots\right.}{4\cdots}\right.}{c^2}$
derivativedivides	$\frac{\frac{a\left(c^2e\,x^2+c^2d\right)^2}{4c^2e}+\frac{b\left(\frac{\arcsin(cx)c^4d^2}{4e}+\frac{\arcsin(cx)c^4d\,x^2}{2}+\frac{e\arcsin(cx)c^4x^4}{4}-\frac{c^4d^2\arcsin(cx)+e^2\left(-\frac{c^3x^3\sqrt{-c^2x^2+1}}{4}-\frac{3cx\sqrt{-c^2x^2}\cdots}{8}\cdots\right.}{\cdots}\right.}{c^2}}{c^2}$
default	$\frac{\frac{a\left(c^2e\,x^2+c^2d\right)^2}{4c^2e}+\frac{b\left(\frac{\arcsin(cx)c^4d^2}{4e}+\frac{\arcsin(cx)c^4d\,x^2}{2}+\frac{e\arcsin(cx)c^4x^4}{4}-\frac{c^4d^2\arcsin(cx)+e^2\left(-\frac{c^3x^3\sqrt{-c^2x^2+1}}{4}-\frac{3cx\sqrt{-c^2x^2}\cdots}{8}\cdots\right.}{\cdots}\right.}{c^2}}{c^2}$

```
[In] int(x*(e*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*a*(e*x^2+d)^2/e+b/c^2*(1/4*c^2*e*arcsin(c*x)*x^4+1/2*arcsin(c*x)*c^2*x^
2*d+1/4*c^2/e*arcsin(c*x)*d^2-1/4/c^2/e*(c^4*d^2*arcsin(c*x)+e^2*(-1/4*c^3*
x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))+2*d*c^2*
e*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.84

$$\int x(d+ex^2)\,(a+b\arcsin(cx))\,dx$$
$$= \frac{8\,ac^4ex^4 + 16\,ac^4dx^2 + (8\,bc^4ex^4 + 16\,bc^4dx^2 - 8\,bc^2d - 3\,be)\arcsin(cx) + (2\,bc^3ex^3 + (8\,bc^3d + 3\,bce)x)\sqrt{\cdots}}{32\,c^4}$$

```
[In] integrate(x*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/32*(8*a*c^4*e*x^4 + 16*a*c^4*d*x^2 + (8*b*c^4*e*x^4 + 16*b*c^4*d*x^2 - 8*
b*c^2*d - 3*b*e)*arcsin(c*x) + (2*b*c^3*e*x^3 + (8*b*c^3*d + 3*b*c*e)*x)*sq
rt(-c^2*x^2 + 1))/c^4
```

Sympy [A] (verification not implemented)

Time = 0.33 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.25

$$\int x(d+ex^2)\,(a+b\arcsin(cx))\,dx$$
$$= \begin{cases} \frac{adx^2}{2} + \frac{aex^4}{4} + \frac{bdx^2\operatorname{asin}(cx)}{2} + \frac{bex^4\operatorname{asin}(cx)}{4} + \frac{bdx\sqrt{-c^2x^2+1}}{4c} + \frac{bex^3\sqrt{-c^2x^2+1}}{16c} - \frac{bd\operatorname{asin}(cx)}{4c^2} + \frac{3bex\sqrt{-c^2x^2+1}}{32c^3} - \frac{3be\operatorname{asin}(c\cdots}{32c^4} \\ a\left(\frac{dx^2}{2} + \frac{ex^4}{4}\right) \end{cases}$$

```
[In] integrate(x*(e*x**2+d)*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d*x**2/2 + a*e*x**4/4 + b*d*x**2*asin(c*x)/2 + b*e*x**4*asin(c
*x)/4 + b*d*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*e*x**3*sqrt(-c**2*x**2 + 1)/(1
6*c) - b*d*asin(c*x)/(4*c**2) + 3*b*e*x*sqrt(-c**2*x**2 + 1)/(32*c**3) - 3*
b*e*asin(c*x)/(32*c**4), Ne(c, 0)), (a*(d*x**2/2 + e*x**4/4), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.00

$$\int x(d+ex^2)\,(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{4}\,aex^4 + \frac{1}{2}\,adx^2 + \frac{1}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd$$
$$+ \frac{1}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\,\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\,\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\,\arcsin(cx)}{c^5}\right)c\right)be$$

```
[In] integrate(x*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/4*a*e*x^4 + 1/2*a*d*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*
x/c^2 - arcsin(c*x)/c^3))*b*d + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2
+ 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.38

$$\int x(d+ex^2)\left(a+b\arcsin(cx)\right)dx = \frac{1}{4}\,aex^4 + \frac{\sqrt{-c^2x^2+1}bdx}{4\,c} + \frac{(c^2x^2-1)bd\arcsin{(cx)}}{2\,c^2} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bex}{16\,c^3} + \frac{(c^2x^2-1)ad}{2\,c^2} + \frac{bd\arcsin{(cx)}}{4\,c^2} + \frac{(c^2x^2-1)^2be\arcsin{(cx)}}{4\,c^4} + \frac{5\sqrt{-c^2x^2+1}bex}{32\,c^3} + \frac{(c^2x^2-1)be\arcsin{(cx)}}{2\,c^4} + \frac{5\,be\arcsin{(cx)}}{32\,c^4}$$

```
[In] integrate(x*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/4*a*e*x^4 + 1/4*sqrt(-c^2*x^2 + 1)*b*d*x/c + 1/2*(c^2*x^2 - 1)*b*d*arcsin
(c*x)/c^2 - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e*x/c^3 + 1/2*(c^2*x^2 - 1)*a*d/c^2
 + 1/4*b*d*arcsin(c*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e*arcsin(c*x)/c^4 + 5/32
*sqrt(-c^2*x^2 + 1)*b*e*x/c^3 + 1/2*(c^2*x^2 - 1)*b*e*arcsin(c*x)/c^4 + 5/3
2*b*e*arcsin(c*x)/c^4
```

Mupad [F(-1)]

Timed out.

$$\int x(d+ex^2)\left(a+b\arcsin(cx)\right)dx = \int x\left(a+b\,\mathrm{asin}(c\,x)\right)\,\left(e\,x^2+d\right)\,dx$$

```
[In] int(x*(a + b*asin(c*x))*(d + e*x^2),x)
```

```
[Out] int(x*(a + b*asin(c*x))*(d + e*x^2), x)
```

3.600 $\int (d+ex^2)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 16, antiderivative size = 81

$$\int (d+ex^2)(a+b\arcsin(cx))\,dx = \frac{b(3c^2d+e)\sqrt{1-c^2x^2}}{3c^3} - \frac{be(1-c^2x^2)^{3/2}}{9c^3} + dx(a+b\arcsin(cx)) + \frac{1}{3}ex^3(a+b\arcsin(cx))$$

```
[Out] -1/9*b*e*(-c^2*x^2+1)^(3/2)/c^3+d*x*(a+b*arcsin(c*x))+1/3*e*x^3*(a+b*arcsin
(c*x))+1/3*b*(3*c^2*d+e)*(-c^2*x^2+1)^(1/2)/c^3
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {4755, 455, 45}

$$\int (d+ex^2)(a+b\arcsin(cx))\,dx = dx(a+b\arcsin(cx)) + \frac{1}{3}ex^3(a+b\arcsin(cx)) + \frac{b\sqrt{1-c^2x^2}(3c^2d+e)}{3c^3} - \frac{be(1-c^2x^2)^{3/2}}{9c^3}$$

```
[In] Int[(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(3*c^2*d + e)*Sqrt[1 - c^2*x^2])/(3*c^3) - (b*e*(1 - c^2*x^2)^(3/2))/(9*
c^3) + d*x*(a + b*ArcSin[c*x]) + (e*x^3*(a + b*ArcSin[c*x]))/3
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4755

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rubi steps

$$\begin{aligned}\text{integral} &= dx(a+b\arcsin(cx))+\frac{1}{3}ex^3(a+b\arcsin(cx))-(bc)\int\frac{x\left(d+\frac{ex^2}{3}\right)}{\sqrt{1-c^2x^2}}\,dx\\
&= dx(a+b\arcsin(cx))+\frac{1}{3}ex^3(a+b\arcsin(cx))-\frac{1}{2}(bc)\text{Subst}\left(\int\frac{d+\frac{ex}{3}}{\sqrt{1-c^2x}}\,dx,x,x^2\right)\\
&= dx(a+b\arcsin(cx))+\frac{1}{3}ex^3(a+b\arcsin(cx))\\
&\quad-\frac{1}{2}(bc)\text{Subst}\left(\int\left(\frac{3c^2d+e}{3c^2\sqrt{1-c^2x}}-\frac{e\sqrt{1-c^2x}}{3c^2}\right)\,dx,x,x^2\right)\\
&= \frac{b(3c^2d+e)\sqrt{1-c^2x^2}}{3c^3}-\frac{be(1-c^2x^2)^{3/2}}{9c^3}+dx(a+b\arcsin(cx))+\frac{1}{3}ex^3(a+b\arcsin(cx))\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.88

$$\int\left(d+ex^2\right)(a+b\arcsin(cx))\,dx=\frac{1}{9}\left(3ax\left(3d+ex^2\right)+\frac{b\sqrt{1-c^2x^2}(2e+c^2(9d+ex^2))}{c^3}+3bx\left(3d+ex^2\right)\arcsin(cx)\right)$$

```
[In] Integrate[(d + e*x^2)*(a + b*ArcSin[c*x]),x]
[Out] (3*a*x*(3*d + e*x^2) + (b*Sqrt[1 - c^2*x^2]*(2*e + c^2*(9*d + e*x^2)))/c^3
+ 3*b*x*(3*d + e*x^2)*ArcSin[c*x])/9
```

Maple [A] (verified)

Time = 0.02 (sec) , antiderivative size = 100, normalized size of antiderivative = 1.23

method	result	size
parts	$a\left(\frac{1}{3}x^{3}e+dx\right)+\frac{b\left(\frac{c\arcsin\left(cx\right)x^{3}e}{3}+\arcsin\left(cx\right)dcx-\frac{e\left(-\frac{c^{2}x^{2}\sqrt{-c^{2}x^{2}+1}}{3}-\frac{2\sqrt{-c^{2}x^{2}+1}}{3}\right)-3d\,c^{2}\sqrt{-c^{2}x^{2}+1}}{3c^{2}}\right)}{c}$	100
derivativedivides	$\frac{\frac{a\left(d\,c^{3}x+\frac{1}{3}e\,c^{3}x^{3}\right)}{c^{2}}+\frac{b\left(\arcsin\left(cx\right)d\,c^{3}x+\frac{\arcsin\left(cx\right)e\,c^{3}x^{3}}{3}-\frac{e\left(-\frac{c^{2}x^{2}\sqrt{-c^{2}x^{2}+1}}{3}-\frac{2\sqrt{-c^{2}x^{2}+1}}{3}\right)}{3}+d\,c^{2}\sqrt{-c^{2}x^{2}+1}\right)}{c^{2}}}{c}$	111
default	$\frac{\frac{a\left(d\,c^{3}x+\frac{1}{3}e\,c^{3}x^{3}\right)}{c^{2}}+\frac{b\left(\arcsin\left(cx\right)d\,c^{3}x+\frac{\arcsin\left(cx\right)e\,c^{3}x^{3}}{3}-\frac{e\left(-\frac{c^{2}x^{2}\sqrt{-c^{2}x^{2}+1}}{3}-\frac{2\sqrt{-c^{2}x^{2}+1}}{3}\right)}{3}+d\,c^{2}\sqrt{-c^{2}x^{2}+1}\right)}{c^{2}}}{c}$	111

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/3*x^3*e+d*x)+b/c*(1/3*c*arcsin(c*x)*x^3*e+arcsin(c*x)*d*c*x-1/3/c^2*(e
*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-3*d*c^2*(-c^2*x^2
+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.01

$$\int \left(d+ex^{2}\right)\left(a+b\arcsin(cx)\right)dx$$
$$=\frac{3\,ac^{3}ex^{3}+9\,ac^{3}dx+3\left(bc^{3}ex^{3}+3\,bc^{3}dx\right)\arcsin\left(cx\right)+\left(bc^{2}ex^{2}+9\,bc^{2}d+2\,be\right)\sqrt{-c^{2}x^{2}+1}}{9\,c^{3}}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/9*(3*a*c^3*e*x^3 + 9*a*c^3*d*x + 3*(b*c^3*e*x^3 + 3*b*c^3*d*x)*arcsin(c*x
) + (b*c^2*e*x^2 + 9*b*c^2*d + 2*b*e)*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A] (verification not implemented)

Time = 0.22 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.35

$$\int (d+ex^2)(a+b\arcsin(cx))\,dx$$
$$= \begin{cases} adx + \frac{aex^3}{3} + bdx\,\mathrm{asin}\,(cx) + \frac{bex^3\,\mathrm{asin}\,(cx)}{3} + \frac{bd\sqrt{-c^2x^2+1}}{c} + \frac{bex^2\sqrt{-c^2x^2+1}}{9c} + \frac{2be\sqrt{-c^2x^2+1}}{9c^3} & \text{for } c \neq 0 \\ a\left(dx + \frac{ex^3}{3}\right) & \text{otherwise} \end{cases}$$

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x)),x)
[Out] Piecewise((a*d*x + a*e*x**3/3 + b*d*x*asin(c*x) + b*e*x**3*asin(c*x)/3 + b*
d*sqrt(-c**2*x**2 + 1)/c + b*e*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + 2*b*e*sqrt
(-c**2*x**2 + 1)/(9*c**3), Ne(c, 0)), (a*(d*x + e*x**3/3), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.12

$$\int (d+ex^2)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{3}aex^3 + \frac{1}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be$$
$$+ adx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd}{c}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] 1/3*a*e*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sq
rt(-c^2*x^2 + 1)/c^4))*b*e + a*d*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))
*b*d/c
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.35

$$\int (d+ex^2)(a+b\arcsin(cx))\,dx = \frac{1}{3}aex^3 + bdx\arcsin(cx) + adx$$
$$+ \frac{(c^2x^2-1)bex\arcsin(cx)}{3c^2} + \frac{bex\arcsin(cx)}{3c^2}$$
$$+ \frac{\sqrt{-c^2x^2+1}bd}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be}{9c^3} + \frac{\sqrt{-c^2x^2+1}be}{3c^3}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/3*a*e*x^3 + b*d*x*arcsin(c*x) + a*d*x + 1/3*(c^2*x^2 - 1)*b*e*x*arcsin(c*
x)/c^2 + 1/3*b*e*x*arcsin(c*x)/c^2 + sqrt(-c^2*x^2 + 1)*b*d/c - 1/9*(-c^2*x
^2 + 1)^(3/2)*b*e/c^3 + 1/3*sqrt(-c^2*x^2 + 1)*b*e/c^3
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex^2)\,(a+b\arcsin(cx))\,dx$$
$$= \begin{cases} b\,e\left(\frac{\sqrt{\frac{1}{c^2}-x^2}\,\left(\frac{2}{c^2}+x^2\right)}{9}+\frac{x^3\,\mathrm{asin}(c\,x)}{3}\right)+\frac{a\,x\,\left(e\,x^2+3\,d\right)}{3}+\frac{b\,d\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c} & \text{if } 0<c \\ \int (a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)\,dx & \text{if } \neg 0<c \end{cases}$$

```
[In] int((a + b*asin(c*x))*(d + e*x^2),x)
```

```
[Out] piecewise(0 < c, b*e*(((1/c^2 - x^2)^(1/2)*(2/c^2 + x^2))/9 + (x^3*asin(c*x
))/3) + (a*x*(3*d + e*x^2))/3 + (b*d*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)
))/c, ~0 < c, int((a + b*asin(c*x))*(d + e*x^2), x))
```

3.601 $\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 132

$$\begin{aligned}\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x}\,dx &= \frac{bex\sqrt{1-c^2x^2}}{4c}-\frac{be\arcsin(cx)}{4c^2}\\ &\quad-\frac{1}{2}ibd\arcsin(cx)^2+\frac{1}{2}ex^2(a+b\arcsin(cx))\\ &\quad+bd\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right)\\ &\quad-bd\arcsin(cx)\log(x)+d(a+b\arcsin(cx))\log(x)\\ &\quad-\frac{1}{2}ibd\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\end{aligned}$$

```
[Out] -1/4*b*e*arcsin(c*x)/c^2-1/2*I*b*d*arcsin(c*x)^2+1/2*e*x^2*(a+b*arcsin(c*x)
)+b*d*arcsin(c*x)*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-b*d*arcsin(c*x)*ln(x)+
d*(a+b*arcsin(c*x))*ln(x)-1/2*I*b*d*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)
+1/4*b*e*x*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.632, Rules used = {14, 4815, 12, 6874, 327, 222, 2363, 4721, 3798, 2221, 2317, 2438}

$$\begin{aligned}\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x}\,dx &= d\log(x)(a+b\arcsin(cx))+\frac{1}{2}ex^2(a+b\arcsin(cx))\\ &\quad-\frac{be\arcsin(cx)}{4c^2}-\frac{1}{2}ibd\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\\ &\quad-\frac{1}{2}ibd\arcsin(cx)^2+bd\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right)\\ &\quad-bd\log(x)\arcsin(cx)+\frac{bex\sqrt{1-c^2x^2}}{4c}\end{aligned}$$

```
[In] Int[((d + e*x^2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (b*e*x*Sqrt[1 - c^2*x^2])/(4*c) - (b*e*ArcSin[c*x])/(4*c^2) - (I/2)*b*d*Arc
Sin[c*x]^2 + (e*x^2*(a + b*ArcSin[c*x]))/2 + b*d*ArcSin[c*x]*Log[1 - E^((2*
I)*ArcSin[c*x])] - b*d*ArcSin[c*x]*Log[x] + d*(a + b*ArcSin[c*x])*Log[x] -
(I/2)*b*d*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2363

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]*((a + b*Log[c*x^n])/Rt[-e, 2]), x
```

```
] - Dist[b*(n/Rt[-e, 2]), Int[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{2}ex^2(a+b\arcsin(cx))+d(a+b\arcsin(cx))\log(x)-(bc)\int\frac{ex^2+2d\log(x)}{2\sqrt{1-c^2x^2}}\,dx\\
&= \frac{1}{2}ex^2(a+b\arcsin(cx))+d(a+b\arcsin(cx))\log(x)-\frac{1}{2}(bc)\int\frac{ex^2+2d\log(x)}{\sqrt{1-c^2x^2}}\,dx\\
&= \frac{1}{2}ex^2(a+b\arcsin(cx))+d(a+b\arcsin(cx))\log(x)-\frac{1}{2}(bc)\int\left(\frac{ex^2}{\sqrt{1-c^2x^2}}+\frac{2d\log(x)}{\sqrt{1-c^2x^2}}\right)dx\\
&= \frac{1}{2}ex^2(a+b\arcsin(cx))+d(a+b\arcsin(cx))\log(x)\\
&\quad-(bcd)\int\frac{\log(x)}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{2}(bce)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx
\end{aligned}$$

$$= \frac{bex\sqrt{1-c^2x^2}}{4c} + \frac{1}{2}ex^2(a+b\arcsin(cx)) - bd\arcsin(cx)\log(x) + d(a+b\arcsin(cx))\log(x) + (bd)\int \frac{\arcsin(cx)}{x}\,dx - \frac{(be)\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4c}$$

$$= \frac{bex\sqrt{1-c^2x^2}}{4c} - \frac{be\arcsin(cx)}{4c^2} + \frac{1}{2}ex^2(a+b\arcsin(cx)) - bd\arcsin(cx)\log(x) + d(a+b\arcsin(cx))\log(x) + (bd)\text{Subst}(\int x\cot(x)\,dx, x, \arcsin(cx))$$

$$= \frac{bex\sqrt{1-c^2x^2}}{4c} - \frac{be\arcsin(cx)}{4c^2} - \frac{1}{2}ibd\arcsin(cx)^2 + \frac{1}{2}ex^2(a+b\arcsin(cx)) - bd\arcsin(cx)\log(x) + d(a+b\arcsin(cx))\log(x) - (2ibd)\text{Subst}\left(\int \frac{e^{2ix}x}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)$$

$$= \frac{bex\sqrt{1-c^2x^2}}{4c} - \frac{be\arcsin(cx)}{4c^2} - \frac{1}{2}ibd\arcsin(cx)^2 + \frac{1}{2}ex^2(a+b\arcsin(cx)) + bd\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - bd\arcsin(cx)\log(x) + d(a+b\arcsin(cx))\log(x) - (bd)\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)$$

$$= \frac{bex\sqrt{1-c^2x^2}}{4c} - \frac{be\arcsin(cx)}{4c^2} - \frac{1}{2}ibd\arcsin(cx)^2 + \frac{1}{2}ex^2(a+b\arcsin(cx)) + bd\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - bd\arcsin(cx)\log(x) + d(a+b\arcsin(cx))\log(x) + \frac{1}{2}(ibd)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)$$

$$= \frac{bex\sqrt{1-c^2x^2}}{4c} - \frac{be\arcsin(cx)}{4c^2} - \frac{1}{2}ibd\arcsin(cx)^2 + \frac{1}{2}ex^2(a+b\arcsin(cx)) + bd\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - bd\arcsin(cx)\log(x) + d(a+b\arcsin(cx))\log(x) - \frac{1}{2}ibd\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.86

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x}\,dx = \frac{1}{2}aex^2 + \frac{bex\sqrt{1-c^2x^2}}{4c} - \frac{be\arcsin(cx)}{4c^2} + \frac{1}{2}bex^2\arcsin(cx) + bd\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) + ad\log(x) - \frac{1}{2}ibd\left(\arcsin(cx)^2 + \text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)\right)$$

```
[In] Integrate[((d + e*x^2)*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (a*e*x^2)/2 + (b*e*x*Sqrt[1 - c^2*x^2])/(4*c) - (b*e*ArcSin[c*x])/(4*c^2) +
 (b*e*x^2*ArcSin[c*x])/2 + b*d*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] +
 a*d*Log[x] - (I/2)*b*d*(ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x])])
```

Maple [A] (verified)

Time = 0.67 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.22

method	result
parts	$\frac{ae\,x^2}{2}+ad\ln\left(x\right)+b\left(-\frac{id\arcsin(cx)^2}{2}+d\arcsin\left(cx\right)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+d\arcsin$
derivativedivides	$\frac{ae\,x^2}{2}+ad\ln\left(cx\right)-\frac{ibd\arcsin(cx)^2}{2}+bd\arcsin\left(cx\right)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)-ibd\,\mathrm{polylo}$
default	$\frac{ae\,x^2}{2}+ad\ln\left(cx\right)-\frac{ibd\arcsin(cx)^2}{2}+bd\arcsin\left(cx\right)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)-ibd\,\mathrm{polylo}$

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*a*e*x^2+a*d*ln(x)+b*(-1/2*I*d*arcsin(c*x)^2+d*arcsin(c*x)*ln(1+I*c*x+(-
c^2*x^2+1)^(1/2))+d*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-I*d*polylog(
2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/4/c^
2*arcsin(c*x)*e*cos(2*arcsin(c*x))+1/8*e/c^2*sin(2*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{(d+ex^2)\,(a+b\arcsin(cx))}{x}\,dx=\int \frac{(ex^2+d)(b\arcsin\left(cx\right)+a)}{x}\,dx$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arcsin(c*x))/x, x)
```

Sympy [F]

$$\int \frac{(d+ex^2)\,(a+b\arcsin(cx))}{x}\,dx=\int \frac{(a+b\,\mathrm{asin}\left(cx\right))\,(d+ex^2)}{x}\,dx$$

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))/x,x)
```

```
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)/x, x)
```

Maxima [F]

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x}\,dx = \int \frac{(ex^2+d)(b\arcsin(cx)+a)}{x}\,dx$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/2*a*e*x^2 + a*d*log(x) + integrate((b*e*x^2 + b*d)*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))/x, x)
```

Giac [F]

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x}\,dx = \int \frac{(ex^2+d)(b\arcsin(cx)+a)}{x}\,dx$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)*(b*arcsin(c*x) + a)/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x}\,dx = \int \frac{(a+b\operatorname{asin}(c\,x))\,(e\,x^2+d)}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + e*x^2))/x,x)
```

```
[Out] int(((a + b*asin(c*x))*(d + e*x^2))/x, x)
```

3.602 $\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^2}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 66

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^2}\,dx = \frac{be\sqrt{1-c^2x^2}}{c} - \frac{d(a+b\arcsin(cx))}{x} + ex(a+b\arcsin(cx)) - bcd\,\text{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -d*(a+b*arcsin(c*x))/x+e*x*(a+b*arcsin(c*x))-b*c*d*arctanh((-c^2*x^2+1)^(1/
2))+b*e*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.05 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.316$, Rules used = {14, 4815, 457, 81, 65, 214}

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^2}\,dx = -\frac{d(a+b\arcsin(cx))}{x} + ex(a+b\arcsin(cx)) - bcd\,\text{arctanh}\left(\sqrt{1-c^2x^2}\right) + \frac{be\sqrt{1-c^2x^2}}{c}$$

```
[In] Int[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (b*e*Sqrt[1 - c^2*x^2])/c - (d*(a + b*ArcSin[c*x]))/x + e*x*(a + b*ArcSin[c
*x]) - b*c*d*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
```

```
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 81

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[b*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/(d*f*(n + p +
 2))), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\text{integral} = -\frac{d(a+b\arcsin(cx))}{x}+ex(a+b\arcsin(cx))-(bc)\int\frac{-d+ex^2}{x\sqrt{1-c^2x^2}}\,dx$$

$$= -\frac{d(a+b\arcsin(cx))}{x}+ex(a+b\arcsin(cx))-\frac{1}{2}(bc)\text{Subst}\left(\int\frac{-d+ex}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)$$

$$
\begin{aligned}
&= \frac{be\sqrt{1-c^2x^2}}{c} - \frac{d(a+b\arcsin(cx))}{x} + ex(a+b\arcsin(cx)) \\
&\quad + \frac{1}{2}(bcd)\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx, x, x^2\right) \\
&= \frac{be\sqrt{1-c^2x^2}}{c} - \frac{d(a+b\arcsin(cx))}{x} + ex(a+b\arcsin(cx)) \\
&\quad - \frac{(bd)\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{c} \\
&= \frac{be\sqrt{1-c^2x^2}}{c} - \frac{d(a+b\arcsin(cx))}{x} + ex(a+b\arcsin(cx)) - bcd\text{arctanh}\left(\sqrt{1-c^2x^2}\right)
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 71, normalized size of antiderivative = 1.08

$$
\begin{aligned}
\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^2}\,dx = {} & -\frac{ad}{x} + aex + \frac{be\sqrt{1-c^2x^2}}{c} - \frac{bd\arcsin(cx)}{x} \\
& + bex\arcsin(cx) - bcd\text{arctanh}\left(\sqrt{1-c^2x^2}\right)
\end{aligned}
$$

```
[In] Integrate[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^2,x]
[Out] -((a*d)/x) + a*e*x + (b*e*Sqrt[1 - c^2*x^2])/c - (b*d*ArcSin[c*x])/x + b*e*
x*ArcSin[c*x] - b*c*d*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Maple [A] (verified)

Time = 0.02 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.20

method	result	size
derivativedivides	$c\left(\frac{a\left(cex-\frac{dc}{x}\right)}{c^2}+\frac{b\left(\arcsin(cx)ecx-\frac{\arcsin(cx)dc}{x}+e\sqrt{-c^2x^2+1}-d\,c^2\,\text{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)\right)}{c^2}\right)$	79
default	$c\left(\frac{a\left(cex-\frac{dc}{x}\right)}{c^2}+\frac{b\left(\arcsin(cx)ecx-\frac{\arcsin(cx)dc}{x}+e\sqrt{-c^2x^2+1}-d\,c^2\,\text{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)\right)}{c^2}\right)$	79
parts	$a\left(ex-\frac{d}{x}\right)+bc\left(\frac{\arcsin(cx)ex}{c}-\frac{\arcsin(cx)d}{cx}-\frac{-e\sqrt{-c^2x^2+1}+d\,c^2\,\text{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)}{c^2}\right)$	80

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] c*(a/c^2*(c*e*x-d*c/x)+b/c^2*(arcsin(c*x)*e*c*x-arcsin(c*x)*d*c/x+e*(-c^2*x
^2+1)^(1/2)-d*c^2*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 103, normalized size of antiderivative = 1.56

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^2}\,dx = -\frac{bc^2dx\log\left(\sqrt{-c^2x^2+1}+1\right)-bc^2dx\log\left(\sqrt{-c^2x^2+1}-1\right)-2\,acex^2-2\sqrt{-c^2x^2+1}bex+2\,acd-2\,(b}{2\,cx}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] -1/2*(b*c^2*d*x*log(sqrt(-c^2*x^2 + 1) + 1) - b*c^2*d*x*log(sqrt(-c^2*x^2 +
 1) - 1) - 2*a*c*e*x^2 - 2*sqrt(-c^2*x^2 + 1)*b*e*x + 2*a*c*d - 2*(b*c*e*x^
2 - b*c*d)*arcsin(c*x))/(c*x)
```

Sympy [A] (verification not implemented)

Time = 2.00 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.14

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^2}\,dx = -\frac{ad}{x}+aex+bcd\left(\begin{cases}-\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|}>1\\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise}\end{cases}\right) - \frac{bd\operatorname{asin}(cx)}{x} + be\left(\begin{cases}0 & \text{for } c=0\\ x\operatorname{asin}(cx)+\frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise}\end{cases}\right)$$

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*d/x + a*e*x + b*c*d*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (
I*asin(1/(c*x)), True)) - b*d*asin(c*x)/x + b*e*Piecewise((0, Eq(c, 0)), (x
*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.20

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^2}\,dx = -\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bd + aex + \frac{\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)be}{c} - \frac{ad}{x}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] -(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*d + a*e*
x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*e/c - a*d/x
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1032 vs. 2(62) = 124.

Time = 0.52 (sec) , antiderivative size = 1032, normalized size of antiderivative = 15.64

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^2}\,dx = \text{Too large to display}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^6*d*x^4*arcsin(c*x)/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(
sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) - 1/2*a*c^6*d*x^4/((c^
4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c
^2*x^2 + 1) + 1)^4) + b*c^5*d*x^3*log(abs(c)*abs(x))/((c^4*x^3/(sqrt(-c^2*x
^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3
) - b*c^5*d*x^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^4*x^3/(sqrt(-c^2*x^2 + 1) +
 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - b*c^4
*d*x^2*arcsin(c*x)/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*
x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - a*c^4*d*x^2/((c^4*x^3/(sqrt(-c
^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) +
1)^2) + b*c^3*d*x*log(abs(c)*abs(x))/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
 c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - b*c^3*d*x*log(
sqrt(-c^2*x^2 + 1) + 1)/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(
-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - b*c^3*e*x^3/((c^4*x^3/(sqrt
(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1)
 + 1)^3) - 1/2*b*c^2*d*arcsin(c*x)/(c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^
2*x/(sqrt(-c^2*x^2 + 1) + 1)) + 2*b*c^2*e*x^2*arcsin(c*x)/((c^4*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) +
 1)^2) - 1/2*a*c^2*d/(c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2
```

```
*x^2 + 1) + 1)) + 2*a*c^2*e*x^2/((c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*
x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + b*c*e*x/((c^4*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^2*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^
2 + 1) + 1))
```

Mupad [B] (verification not implemented)

Time = 0.38 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.06

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^2}\,dx = \frac{b\,e\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c}-\frac{b\,d\,\mathrm{asin}(c\,x)}{x} - b\,c\,d\,\mathrm{atanh}\left(\frac{1}{\sqrt{1-c^2\,x^2}}\right)-\frac{a\,(d-e\,x^2)}{x}$$

```
[In] int(((a + b*asin(c*x))*(d + e*x^2))/x^2,x)
```

```
[Out] (b*e*((1 - c^2*x^2)^(1/2) + c*x*asin(c*x)))/c - (b*d*asin(c*x))/x - b*c*d*a
tanh(1/(1 - c^2*x^2)^(1/2)) - (a*(d - e*x^2))/x
```

3.603 $\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^3}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 119

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^3}\,dx = -\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{1}{2}ibe\arcsin(cx)^2-\frac{d(a+b\arcsin(cx))}{2x^2}+be\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right)-be\arcsin(cx)\log(x)+e(a+b\arcsin(cx))\log(x)-\frac{1}{2}ibe\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)$$

```
[Out] -1/2*I*b*e*arcsin(c*x)^2-1/2*d*(a+b*arcsin(c*x))/x^2+b*e*arcsin(c*x)*ln(1-(
I*c*x+(-c^2*x^2+1)^(1/2))^2)-b*e*arcsin(c*x)*ln(x)+e*(a+b*arcsin(c*x))*ln(x
)-1/2*I*b*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b*c*d*(-c^2*x^2+1)^
(1/2)/x
```

Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.526, Rules used = {14, 4815, 6874, 270, 2363, 4721, 3798, 2221, 2317, 2438}

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^3}\,dx = -\frac{d(a+b\arcsin(cx))}{2x^2}+e\log(x)(a+b\arcsin(cx))-\frac{1}{2}ibe\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)-\frac{1}{2}ibe\arcsin(cx)^2+be\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right)-be\log(x)\arcsin(cx)-\frac{bcd\sqrt{1-c^2x^2}}{2x}$$

```
[In] Int[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(b*c*d*Sqrt[1 - c^2*x^2])/x - (I/2)*b*e*ArcSin[c*x]^2 - (d*(a + b*ArcS
in[c*x]))/(2*x^2) + b*e*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - b*e*Ar
cSin[c*x]*Log[x] + e*(a + b*ArcSin[c*x])*Log[x] - (I/2)*b*e*PolyLog[2, E^((
2*I)*ArcSin[c*x])]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2363

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]*((a + b*Log[c*x^n])/Rt[-e, 2]), x
] - Dist[b*(n/Rt[-e, 2]), Int[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
```

```
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{d(a+b\arcsin(cx))}{2x^2}+e(a+b\arcsin(cx))\log(x)-(bc)\int\frac{-\frac{d}{2x^2}+e\log(x)}{\sqrt{1-c^2x^2}}\,dx\\
&= -\frac{d(a+b\arcsin(cx))}{2x^2}+e(a+b\arcsin(cx))\log(x)\\
&\quad-(bc)\int\left(-\frac{d}{2x^2\sqrt{1-c^2x^2}}+\frac{e\log(x)}{\sqrt{1-c^2x^2}}\right)dx\\
&= -\frac{d(a+b\arcsin(cx))}{2x^2}+e(a+b\arcsin(cx))\log(x)\\
&\quad+\frac{1}{2}(bcd)\int\frac{1}{x^2\sqrt{1-c^2x^2}}\,dx-(bce)\int\frac{\log(x)}{\sqrt{1-c^2x^2}}\,dx\\
&= -\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{d(a+b\arcsin(cx))}{2x^2}-be\arcsin(cx)\log(x)\\
&\quad+e(a+b\arcsin(cx))\log(x)+(be)\int\frac{\arcsin(cx)}{x}\,dx\\
&= -\frac{bcd\sqrt{1-c^2x^2}}{2x}-\frac{d(a+b\arcsin(cx))}{2x^2}-be\arcsin(cx)\log(x)\\
&\quad+e(a+b\arcsin(cx))\log(x)+(be)\text{Subst}\left(\int x\cot(x)\,dx,x,\arcsin(cx)\right)
\end{aligned}
$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}ibe\arcsin(cx)^2 - \frac{d(a+b\arcsin(cx))}{2x^2} - be\arcsin(cx)\log(x) + e(a+b\arcsin(cx))\log(x) - (2ibe)\text{Subst}\left(\int \frac{e^{2ix}x}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}ibe\arcsin(cx)^2 - \frac{d(a+b\arcsin(cx))}{2x^2} + be\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - be\arcsin(cx)\log(x) + e(a+b\arcsin(cx))\log(x) - (be)\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}ibe\arcsin(cx)^2 - \frac{d(a+b\arcsin(cx))}{2x^2} + be\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - be\arcsin(cx)\log(x) + e(a+b\arcsin(cx))\log(x) + \frac{1}{2}(ibe)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)$$

$$= -\frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{1}{2}ibe\arcsin(cx)^2 - \frac{d(a+b\arcsin(cx))}{2x^2} + be\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - be\arcsin(cx)\log(x) + e(a+b\arcsin(cx))\log(x) - \frac{1}{2}ibe\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 101, normalized size of antiderivative = 0.85

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^3}\,dx = -\frac{ad}{2x^2} - \frac{bcd\sqrt{1-c^2x^2}}{2x} - \frac{bd\arcsin(cx)}{2x^2} + be\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) + ae\log(x) - \frac{1}{2}ibe\left(\arcsin(cx)^2 + \text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)\right)$$

```
[In] Integrate[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(a*d)/x^2 - (b*c*d*Sqrt[1 - c^2*x^2])/(2*x) - (b*d*ArcSin[c*x])/(2*x^2
) + b*e*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + a*e*Log[x] - (I/2)*b*e
*(ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x])])
```

Maple [A] (verified)

Time = 0.52 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.52

method	result
derivativedivides	$c^2 \left(-\frac{ad}{2c^2x^2} + \frac{ae\ln(cx)}{c^2} + \frac{b\left(-\frac{i\arcsin(cx)^2 e}{2} - \frac{d\left(-ic^2x^2+cx\sqrt{-c^2x^2+1}+\arcsin(cx)\right)}{2x^2} + \ln\left(1+icx+\sqrt{-c^2x^2+1}\right)e\arcsi\right.}{}\right.$
default	$c^2 \left(-\frac{ad}{2c^2x^2} + \frac{ae\ln(cx)}{c^2} + \frac{b\left(-\frac{i\arcsin(cx)^2 e}{2} - \frac{d\left(-ic^2x^2+cx\sqrt{-c^2x^2+1}+\arcsin(cx)\right)}{2x^2} + \ln\left(1+icx+\sqrt{-c^2x^2+1}\right)e\arcsi\right.}{}\right.$
parts	$-\frac{ad}{2x^2} + ae\ln(x) + b\,c^2 \left(-\frac{i\arcsin(cx)^2 e}{2c^2} - \frac{d\left(-ic^2x^2+cx\sqrt{-c^2x^2+1}+\arcsin(cx)\right)}{2c^2x^2} + \frac{e\arcsin(cx)\ln\left(1+icx\right.}{c^2}\right.$

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)
[Out] c^2*(-1/2*a*d/c^2/x^2+a/c^2*e*ln(c*x)+b/c^2*(-1/2*I*arcsin(c*x)^2*e-1/2*d*(
-I*c^2*x^2+c*x*(-c^2*x^2+1)^(1/2)+arcsin(c*x))/x^2+ln(1+I*c*x+(-c^2*x^2+1)^
(1/2))*e*arcsin(c*x)+ln(1-I*c*x-(-c^2*x^2+1)^(1/2))*e*arcsin(c*x)-I*polylog
(2,-I*c*x-(-c^2*x^2+1)^(1/2))*e-I*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))*e))
```

Fricas [F]

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(ex^2+d)(b\arcsin(cx)+a)}{x^3}\,dx$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arcsin(c*x))/x^3, x)
```

Sympy [F]

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(cx))(d+ex^2)}{x^3}\,dx$$

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))/x**3,x)
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)/x**3, x)
```

Maxima [F]

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(ex^2+d)(b\arcsin(cx)+a)}{x^3}\,dx$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*b*d*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) + b*e*integrate(arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x) + a*e*log(x) - 1/2*a*d/x^2
```

Giac [F]

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(ex^2+d)(b\arcsin(cx)+a)}{x^3}\,dx$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)*(b*arcsin(c*x) + a)/x^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(e\,x^2+d)}{x^3}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + e*x^2))/x^3,x)
```

```
[Out] int(((a + b*asin(c*x))*(d + e*x^2))/x^3, x)
```

3.604 $\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^4} dx$

Optimal result

Integrand size = 19, antiderivative size = 85

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^4} dx = -\frac{bcd\sqrt{1-c^2x^2}}{6x^2} - \frac{d(a+b\arcsin(cx))}{3x^3} - \frac{e(a+b\arcsin(cx))}{x} - \frac{1}{6}bc(c^2d+6e)\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -1/3*d*(a+b*arcsin(c*x))/x^3-e*(a+b*arcsin(c*x))/x-1/6*b*c*(c^2*d+6*e)*arct
anh((-c^2*x^2+1)^(1/2))-1/6*b*c*d*(-c^2*x^2+1)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {14, 4815, 12, 457, 79, 65, 214}

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^4} dx = -\frac{d(a+b\arcsin(cx))}{3x^3} - \frac{e(a+b\arcsin(cx))}{x} - \frac{1}{6}bc\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)(c^2d+6e) - \frac{bcd\sqrt{1-c^2x^2}}{6x^2}$$

```
[In] Int[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/6*(b*c*d*Sqrt[1 - c^2*x^2])/x^2 - (d*(a + b*ArcSin[c*x]))/(3*x^3) - (e*(
a + b*ArcSin[c*x]))/x - (b*c*(c^2*d + 6*e)*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(-(b*e - a*f))*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/
(f*(p + 1)*(c*f - d*e))), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c
*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x]
, x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || I
ntegerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))
))
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d(a+b\arcsin(cx))}{3x^3}-\frac{e(a+b\arcsin(cx))}{x}-(bc)\int\frac{-d-3ex^2}{3x^3\sqrt{1-c^2x^2}}\,dx\\
&= -\frac{d(a+b\arcsin(cx))}{3x^3}-\frac{e(a+b\arcsin(cx))}{x}-\frac{1}{3}(bc)\int\frac{-d-3ex^2}{x^3\sqrt{1-c^2x^2}}\,dx\\
&= -\frac{d(a+b\arcsin(cx))}{3x^3}-\frac{e(a+b\arcsin(cx))}{x}-\frac{1}{6}(bc)\text{Subst}\left(\int\frac{-d-3ex}{x^2\sqrt{1-c^2x}}\,dx,x,x^2\right)\\
&= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d(a+b\arcsin(cx))}{3x^3}-\frac{e(a+b\arcsin(cx))}{x}\\
&\quad+\frac{1}{12}\left(bc\left(c^2d+6e\right)\right)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)\\
&= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d(a+b\arcsin(cx))}{3x^3}-\frac{e(a+b\arcsin(cx))}{x}\\
&\quad-\frac{\left(b\left(c^2d+6e\right)\right)\text{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{6c}\\
&= -\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{d(a+b\arcsin(cx))}{3x^3}-\frac{e(a+b\arcsin(cx))}{x}\\
&\quad-\frac{1}{6}bc\left(c^2d+6e\right)\text{arctanh}\left(\sqrt{1-c^2x^2}\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.28

$$\int\frac{\left(d+ex^2\right)(a+b\arcsin(cx))}{x^4}\,dx = -\frac{ad}{3x^3}-\frac{ae}{x}-\frac{bcd\sqrt{1-c^2x^2}}{6x^2}-\frac{bd\arcsin(cx)}{3x^3}-\frac{be\arcsin(cx)}{x}-\frac{1}{6}bc^3d\,\text{arctanh}\left(\sqrt{1-c^2x^2}\right)-bce\,\text{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

```
[In] Integrate[((d + e*x^2)*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] -1/3*(a*d)/x^3 - (a*e)/x - (b*c*d*Sqrt[1 - c^2*x^2])/(6*x^2) - (b*d*ArcSin[
c*x])/(3*x^3) - (b*e*ArcSin[c*x])/x - (b*c^3*d*ArcTanh[Sqrt[1 - c^2*x^2]])/
6 - b*c*e*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Maple [A] (verified)

Time = 0.03 (sec) , antiderivative size = 113, normalized size of antiderivative = 1.33

method	result
parts	$a\left(-\frac{e}{x}-\frac{d}{3x^3}\right)+b\,c^3\left(-\frac{\arcsin(cx)e}{c^3x}-\frac{\arcsin(cx)d}{3c^3x^3}-\frac{-d\,c^2\left(-\frac{\sqrt{-c^2x^2+1}}{2c^2x^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)}{2}\right)+3e\operatorname{arctan}}{3c^2}\right)$
derivativedivides	$c^3\left(\frac{a\left(-\frac{d}{3c\,x^3}-\frac{e}{cx}\right)}{c^2}+\frac{b\left(-\frac{\arcsin(cx)d}{3c\,x^3}-\frac{\arcsin(cx)e}{cx}-e\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)+\frac{d\,c^2\left(-\frac{\sqrt{-c^2x^2+1}}{2c^2x^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)}{2}\right)}{3}\right)}{c^2}\right)$
default	$c^3\left(\frac{a\left(-\frac{d}{3c\,x^3}-\frac{e}{cx}\right)}{c^2}+\frac{b\left(-\frac{\arcsin(cx)d}{3c\,x^3}-\frac{\arcsin(cx)e}{cx}-e\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)+\frac{d\,c^2\left(-\frac{\sqrt{-c^2x^2+1}}{2c^2x^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^2x^2+1}}\right)}{2}\right)}{3}\right)}{c^2}\right)$

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] a*(-e/x-1/3*d/x^3)+b*c^3*(-1/c^3*arcsin(c*x)*e/x-1/3*arcsin(c*x)*d/c^3/x^3-
1/3/c^2*(-d*c^2*(-1/2/c^2/x^2*(-c^2*x^2+1)^(1/2)-1/2*arctanh(1/(-c^2*x^2+1)
^(1/2)))+3*e*arctanh(1/(-c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.35

$$\int \frac{(d+ex^2)\,(a+b\arcsin(cx))}{x^4}\,dx = -\frac{(bc^3d+6\,bce)x^3\log\left(\sqrt{-c^2x^2+1}+1\right)-(bc^3d+6\,bce)x^3\log\left(\sqrt{-c^2x^2+1}-1\right)+2\sqrt{-c^2x^2+1}bcdx+}{12\,x^3}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] -1/12*((b*c^3*d + 6*b*c*e)*x^3*log(sqrt(-c^2*x^2 + 1) + 1) - (b*c^3*d + 6*b
*c*e)*x^3*log(sqrt(-c^2*x^2 + 1) - 1) + 2*sqrt(-c^2*x^2 + 1)*b*c*d*x + 12*a
*e*x^2 + 4*a*d + 4*(3*b*e*x^2 + b*d)*arcsin(c*x))/x^3
```

Sympy [A] (verification not implemented)

Time = 3.43 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.98

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^4}\,dx = -\frac{ad}{3x^3} - \frac{ae}{x} + \frac{bcd\left(\begin{cases} -\frac{c^2\operatorname{acosh}\left(\frac{1}{cx}\right)}{2} + \frac{c}{2x\sqrt{-1+\frac{1}{c^2x^2}}} - \frac{1}{2cx^3\sqrt{-1+\frac{1}{c^2x^2}}} & \text{for } \frac{1}{|c^2x^2|} > 1 \\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx}\right)}{2} - \frac{ic\sqrt{1-\frac{1}{c^2x^2}}}{2x} & \text{otherwise} \end{cases}\right)}{3} + bce\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|} > 1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) - \frac{bd\operatorname{asin}(cx)}{3x^3} - \frac{be\operatorname{asin}(cx)}{x}$$

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))/x**4,x)
```

```
[Out] -a*d/(3*x**3) - a*e/x + b*c*d*Piecewise((-c**2*acosh(1/(c*x))/2 + c/(2*x*sq
rt(-1 + 1/(c**2*x**2))) - 1/(2*c*x**3*sqrt(-1 + 1/(c**2*x**2))), 1/Abs(c**2
*x**2) > 1), (I*c**2*asin(1/(c*x))/2 - I*c*sqrt(1 - 1/(c**2*x**2))/(2*x), T
rue))/3 + b*c*e*Piecewise((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(
1/(c*x)), True)) - b*d*asin(c*x)/(3*x**3) - b*e*asin(c*x)/x
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.40

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^4}\,dx = -\frac{1}{6}\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\sqrt{-c^2x^2+1}}{x^2}\right)c + \frac{2\arcsin(cx)}{x^3}\right)bd - \left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\arcsin(cx)}{x}\right)be - \frac{ae}{x} - \frac{ad}{3\,x^3}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] -1/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)
/x^2)*c + 2*arcsin(c*x)/x^3)*b*d - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/a
bs(x)) + arcsin(c*x)/x)*b*e - a*e/x - 1/3*a*d/x^3
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 424 vs. $2(75) = 150$.

Time = 124.08 (sec) , antiderivative size = 424, normalized size of antiderivative = 4.99

$$\int \frac{(d+ex^2)(a+b\arcsin(cx))}{x^4}\,dx = -\frac{bc^6dx^3\arcsin(cx)}{24\left(\sqrt{-c^2x^2+1}+1\right)^3} - \frac{ac^6dx^3}{24\left(\sqrt{-c^2x^2+1}+1\right)^3} + \frac{bc^5dx^2}{24\left(\sqrt{-c^2x^2+1}+1\right)^2} - \frac{bc^4dx\arcsin(cx)}{8\left(\sqrt{-c^2x^2+1}+1\right)} - \frac{ac^4dx}{8\left(\sqrt{-c^2x^2+1}+1\right)} + \frac{1}{6}bc^3d\log(|c||x|) - \frac{1}{6}bc^3d\log\left(\sqrt{-c^2x^2+1}+1\right) - \frac{bc^2ex\arcsin(cx)}{2\left(\sqrt{-c^2x^2+1}+1\right)} - \frac{bc^2d\left(\sqrt{-c^2x^2+1}+1\right)\arcsin(cx)}{8x} - \frac{ac^2ex}{2\left(\sqrt{-c^2x^2+1}+1\right)} - \frac{ac^2d\left(\sqrt{-c^2x^2+1}+1\right)}{8x} + bce\log(|c||x|) - bce\log\left(\sqrt{-c^2x^2+1}+1\right) - \frac{bcd\left(\sqrt{-c^2x^2+1}+1\right)^2}{24x^2} - \frac{be\left(\sqrt{-c^2x^2+1}+1\right)\arcsin(cx)}{2x} - \frac{bd\left(\sqrt{-c^2x^2+1}+1\right)^3\arcsin(cx)}{24x^3} - \frac{ae\left(\sqrt{-c^2x^2+1}+1\right)}{2x} - \frac{ad\left(\sqrt{-c^2x^2+1}+1\right)^3}{24x^3}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] -1/24*b*c^6*d*x^3*arcsin(c*x)/(sqrt(-c^2*x^2 + 1) + 1)^3 - 1/24*a*c^6*d*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + 1/24*b*c^5*d*x^2/(sqrt(-c^2*x^2 + 1) + 1)^2 -
 1/8*b*c^4*d*x*arcsin(c*x)/(sqrt(-c^2*x^2 + 1) + 1) - 1/8*a*c^4*d*x/(sqrt(-
c^2*x^2 + 1) + 1) + 1/6*b*c^3*d*log(abs(c)*abs(x)) - 1/6*b*c^3*d*log(sqrt(-
c^2*x^2 + 1) + 1) - 1/2*b*c^2*e*x*arcsin(c*x)/(sqrt(-c^2*x^2 + 1) + 1) - 1/
8*b*c^2*d*(sqrt(-c^2*x^2 + 1) + 1)*arcsin(c*x)/x - 1/2*a*c^2*e*x/(sqrt(-c^2
*x^2 + 1) + 1) - 1/8*a*c^2*d*(sqrt(-c^2*x^2 + 1) + 1)/x + b*c*e*log(abs(c)*
abs(x)) - b*c*e*log(sqrt(-c^2*x^2 + 1) + 1) - 1/24*b*c*d*(sqrt(-c^2*x^2 + 1
) + 1)^2/x^2 - 1/2*b*e*(sqrt(-c^2*x^2 + 1) + 1)*arcsin(c*x)/x - 1/24*b*d*(s
qrt(-c^2*x^2 + 1) + 1)^3*arcsin(c*x)/x^3 - 1/2*a*e*(sqrt(-c^2*x^2 + 1) + 1)
/x - 1/24*a*d*(sqrt(-c^2*x^2 + 1) + 1)^3/x^3
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex^2)\,(a+b\arcsin(cx))}{x^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)}{x^4}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + e*x^2))/x^4,x)
[Out] int(((a + b*asin(c*x))*(d + e*x^2))/x^4, x)
```

3.605 $\int x^4(d+ex^2)^2(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 241

$$\int x^4(d+ex^2)^2(a+b\arcsin(cx))\,dx = \frac{b(63c^4d^2+90c^2de+35e^2)\sqrt{1-c^2x^2}}{315c^9} - \frac{2b(63c^4d^2+135c^2de+70e^2)(1-c^2x^2)^{3/2}}{945c^9} + \frac{b(21c^4d^2+90c^2de+70e^2)(1-c^2x^2)^{5/2}}{525c^9} - \frac{2be(9c^2d+14e)(1-c^2x^2)^{7/2}}{441c^9} + \frac{be^2(1-c^2x^2)^{9/2}}{81c^9} + \frac{1}{5}d^2x^5(a+b\arcsin(cx)) + \frac{2}{7}dex^7(a+b\arcsin(cx)) + \frac{1}{9}e^2x^9(a+b\arcsin(cx))$$

```
[Out] -2/945*b*(63*c^4*d^2+135*c^2*d*e+70*e^2)*(-c^2*x^2+1)^(3/2)/c^9+1/525*b*(21
*c^4*d^2+90*c^2*d*e+70*e^2)*(-c^2*x^2+1)^(5/2)/c^9-2/441*b*e*(9*c^2*d+14*e)
*(-c^2*x^2+1)^(7/2)/c^9+1/81*b*e^2*(-c^2*x^2+1)^(9/2)/c^9+1/5*d^2*x^5*(a+b*
arcsin(c*x))+2/7*d*e*x^7*(a+b*arcsin(c*x))+1/9*e^2*x^9*(a+b*arcsin(c*x))+1/
315*b*(63*c^4*d^2+90*c^2*d*e+35*e^2)*(-c^2*x^2+1)^(1/2)/c^9
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 241, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used

$= \{276, 4815, 12, 1265, 911, 1167\}$

$$\int x^4 (d+ex^2)^2 (a+b\arcsin(cx))\,dx = \frac{1}{5}d^2x^5(a+b\arcsin(cx)) + \frac{2}{7}dex^7(a+b\arcsin(cx)) + \frac{1}{9}e^2x^9(a+b\arcsin(cx)) - \frac{2be(1-c^2x^2)^{7/2}(9c^2d+14e)}{441c^9} + \frac{be^2(1-c^2x^2)^{9/2}}{81c^9} + \frac{b(1-c^2x^2)^{5/2}(21c^4d^2+90c^2de+70e^2)}{525c^9} - \frac{2b(1-c^2x^2)^{3/2}(63c^4d^2+135c^2de+70e^2)}{945c^9} + \frac{b\sqrt{1-c^2x^2}(63c^4d^2+90c^2de+35e^2)}{315c^9}$$

```
[In] Int[x^4*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(63*c^4*d^2 + 90*c^2*d*e + 35*e^2)*Sqrt[1 - c^2*x^2])/(315*c^9) - (2*b*(
63*c^4*d^2 + 135*c^2*d*e + 70*e^2)*(1 - c^2*x^2)^(3/2))/(945*c^9) + (b*(21*
c^4*d^2 + 90*c^2*d*e + 70*e^2)*(1 - c^2*x^2)^(5/2))/(525*c^9) - (2*b*e*(9*c
^2*d + 14*e)*(1 - c^2*x^2)^(7/2))/(441*c^9) + (b*e^2*(1 - c^2*x^2)^(9/2))/(
81*c^9) + (d^2*x^5*(a + b*ArcSin[c*x]))/5 + (2*d*e*x^7*(a + b*ArcSin[c*x]))
/7 + (e^2*x^9*(a + b*ArcSin[c*x]))/9
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\text{integral} = \frac{1}{5}d^2x^5(a+b\arcsin(cx)) + \frac{2}{7}dex^7(a+b\arcsin(cx)) + \frac{1}{9}e^2x^9(a+b\arcsin(cx)) - (bc)\int \frac{x^5(63d^2+90dex^2+35e^2x^4)}{315\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{1}{5}d^2x^5(a+b\arcsin(cx)) + \frac{2}{7}dex^7(a+b\arcsin(cx)) + \frac{1}{9}e^2x^9(a+b\arcsin(cx)) - \frac{1}{315}(bc)\int \frac{x^5(63d^2+90dex^2+35e^2x^4)}{\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{1}{5}d^2x^5(a+b\arcsin(cx)) + \frac{2}{7}dex^7(a+b\arcsin(cx)) + \frac{1}{9}e^2x^9(a+b\arcsin(cx)) - \frac{1}{630}(bc)\text{Subst}\left(\int \frac{x^2(63d^2+90dex+35e^2x^2)}{\sqrt{1-c^2x}}\,dx, x, x^2\right)$$

$$= \frac{1}{5}d^2x^5(a+b\arcsin(cx)) + \frac{2}{7}dex^7(a+b\arcsin(cx)) + \frac{1}{9}e^2x^9(a+b\arcsin(cx)) + \frac{b\text{Subst}\left(\int \left(\frac{1}{c^2}-\frac{x^2}{c^2}\right)^2\left(\frac{63c^4d^2+90c^2de+35e^2}{c^4}-\frac{(90c^2de+70e^2)x^2}{c^4}+\frac{35e^2x^4}{c^4}\right)dx, x, \sqrt{1-c^2x^2}\right)}{315c}$$

$$= \frac{1}{5}d^2x^5(a+b\arcsin(cx)) + \frac{2}{7}dex^7(a+b\arcsin(cx)) + \frac{1}{9}e^2x^9(a+b\arcsin(cx)) + \frac{b\text{Subst}\left(\int \left(\frac{63c^4d^2+90c^2de+35e^2}{c^8}-\frac{2(63c^4d^2+135c^2de+70e^2)x^2}{c^8}+\frac{3(21c^4d^2+90c^2de+70e^2)x^4}{c^8}-\frac{10e(9c^2d+14e)x^6}{c^8}+3\right.}{315c}$$

$$= \frac{b(63c^4d^2+90c^2de+35e^2)\sqrt{1-c^2x^2}}{315c^9} - \frac{2b(63c^4d^2+135c^2de+70e^2)(1-c^2x^2)^{3/2}}{945c^9} + \frac{b(21c^4d^2+90c^2de+70e^2)(1-c^2x^2)^{5/2}}{525c^9} - \frac{2be(9c^2d+14e)(1-c^2x^2)^{7/2}}{441c^9} + \frac{be^2(1-c^2x^2)^{9/2}}{81c^9} + \frac{1}{5}d^2x^5(a+b\arcsin(cx)) + \frac{2}{7}dex^7(a+b\arcsin(cx)) + \frac{1}{9}e^2x^9(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 187, normalized size of antiderivative = 0.78

$$\int x^4(d+ex^2)^2(a+b\arcsin(cx))\,dx = \frac{315ax^5(63d^2+90dex^2+35e^2x^4)+\frac{b\sqrt{1-c^2x^2}(4480e^2+160c^2e(81d+14ex^2)+24c^4(441d^2+270dex^2+70e^2x^4)+4c^6(1323d^2x^2+121}{c^9}}{99225}$$

```
[In] Integrate[x^4*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (315*a*x^5*(63*d^2 + 90*d*e*x^2 + 35*e^2*x^4) + (b*Sqrt[1 - c^2*x^2]*(4480*
e^2 + 160*c^2*e*(81*d + 14*e*x^2) + 24*c^4*(441*d^2 + 270*d*e*x^2 + 70*e^2*
x^4) + 4*c^6*(1323*d^2*x^2 + 1215*d*e*x^4 + 350*e^2*x^6) + c^8*(3969*d^2*x^
4 + 4050*d*e*x^6 + 1225*e^2*x^8)))/c^9 + 315*b*x^5*(63*d^2 + 90*d*e*x^2 + 3
5*e^2*x^4)*ArcSin[c*x])/99225
```

Maple [A] (verified)

Time = 0.47 (sec) , antiderivative size = 329, normalized size of antiderivative = 1.37

method	result
parts	$a\left(\frac{1}{9}e^2x^9+\frac{2}{7}de\,x^7+\frac{1}{5}d^2x^5\right)+\frac{b\left(\frac{c^5\arcsin(cx)e^2x^9}{9}+\frac{2c^5\arcsin(cx)ed\,x^7}{7}+\frac{\arcsin(cx)d^2c^5x^5}{5}-\frac{35e^2\left(-\frac{c^8x^8\sqrt{-c^2x^2+1}}{9}\right.}{}\right.}{}$
derivativedivides	$\frac{\frac{a\left(\frac{1}{5}d^2c^9x^5+\frac{2}{7}dc^9e\,x^7+\frac{1}{9}e^2c^9x^9\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)d^2c^9x^5}{5}+\frac{2\arcsin(cx)dc^9e\,x^7}{7}+\frac{\arcsin(cx)e^2c^9x^9}{9}-\frac{e^2\left(-\frac{c^8x^8\sqrt{-c^2x^2+1}}{9}-\frac{8c^6}{}\right.}{}\right.}{}}{}$
default	$\frac{\frac{a\left(\frac{1}{5}d^2c^9x^5+\frac{2}{7}dc^9e\,x^7+\frac{1}{9}e^2c^9x^9\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)d^2c^9x^5}{5}+\frac{2\arcsin(cx)dc^9e\,x^7}{7}+\frac{\arcsin(cx)e^2c^9x^9}{9}-\frac{e^2\left(-\frac{c^8x^8\sqrt{-c^2x^2+1}}{9}-\frac{8c^6}{}\right.}{}\right.}{}}{}$

```
[In] int(x^4*(e*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/9*e^2*x^9+2/7*d*e*x^7+1/5*d^2*x^5)+b/c^5*(1/9*c^5*arcsin(c*x)*e^2*x^9+
2/7*c^5*arcsin(c*x)*e*d*x^7+1/5*arcsin(c*x)*d^2*c^5*x^5-1/315/c^4*(35*e^2*(
-1/9*c^8*x^8*(-c^2*x^2+1)^(1/2)-8/63*c^6*x^6*(-c^2*x^2+1)^(1/2)-16/105*c^4*
x^4*(-c^2*x^2+1)^(1/2)-64/315*c^2*x^2*(-c^2*x^2+1)^(1/2)-128/315*(-c^2*x^2+
1)^(1/2))+63*d^2*c^4*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^
2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))+90*d*c^2*e*(-1/7*c^6*x^6*(-c^2*x^2+1)^(
1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*
(-c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 219, normalized size of antiderivative = 0.91

$$\int x^4 \left(d+ex^2\right)^2 (a+b\arcsin(cx))\,dx$$
$$= \frac{11025\,ac^9e^2x^9 + 28350\,ac^9dex^7 + 19845\,ac^9d^2x^5 + 315\,(35\,bc^9e^2x^9 + 90\,bc^9dex^7 + 63\,bc^9d^2x^5)\arcsin{(cx)} +}{}$$

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/99225*(11025*a*c^9*e^2*x^9 + 28350*a*c^9*d*e*x^7 + 19845*a*c^9*d^2*x^5 +
315*(35*b*c^9*e^2*x^9 + 90*b*c^9*d*e*x^7 + 63*b*c^9*d^2*x^5)*arcsin(c*x) +
(1225*b*c^8*e^2*x^8 + 10584*b*c^4*d^2 + 50*(81*b*c^8*d*e + 28*b*c^6*e^2)*x^
6 + 12960*b*c^2*d*e + 3*(1323*b*c^8*d^2 + 1620*b*c^6*d*e + 560*b*c^4*e^2)*x
^4 + 4480*b*e^2 + 4*(1323*b*c^6*d^2 + 1620*b*c^4*d*e + 560*b*c^2*e^2)*x^2)*
sqrt(-c^2*x^2 + 1))/c^9
```

Sympy [A] (verification not implemented)

Time = 1.30 (sec) , antiderivative size = 415, normalized size of antiderivative = 1.72

$$\int x^4 \left(d+ex^2\right)^2 (a+b\arcsin(cx))\,dx$$
$$= \begin{cases} \frac{ad^2x^5}{5} + \frac{2adex^7}{7} + \frac{ae^2x^9}{9} + \frac{bd^2x^5\operatorname{asin}{(cx)}}{5} + \frac{2bdex^7\operatorname{asin}{(cx)}}{7} + \frac{be^2x^9\operatorname{asin}{(cx)}}{9} + \frac{bd^2x^4\sqrt{-c^2x^2+1}}{25c} + \frac{2bdex^6\sqrt{-c^2x^2+1}}{49c} + \frac{be^2x^8}{} \\ a\left(\frac{d^2x^5}{5} + \frac{2dex^7}{7} + \frac{e^2x^9}{9}\right) \end{cases}$$

```
[In] integrate(x**4*(e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x**5/5 + 2*a*d*e*x**7/7 + a*e**2*x**9/9 + b*d**2*x**5*asi
n(c*x)/5 + 2*b*d*e*x**7*asin(c*x)/7 + b*e**2*x**9*asin(c*x)/9 + b*d**2*x**4
*sqrt(-c**2*x**2 + 1)/(25*c) + 2*b*d*e*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + b
*e**2*x**8*sqrt(-c**2*x**2 + 1)/(81*c) + 4*b*d**2*x**2*sqrt(-c**2*x**2 + 1)
```

```
/(75*c**3) + 12*b*d*e*x**4*sqrt(-c**2*x**2 + 1)/(245*c**3) + 8*b*e**2*x**6*
sqrt(-c**2*x**2 + 1)/(567*c**3) + 8*b*d**2*sqrt(-c**2*x**2 + 1)/(75*c**5) +
 16*b*d*e*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e**2*x**4*sqrt(-c**2*
x**2 + 1)/(945*c**5) + 32*b*d*e*sqrt(-c**2*x**2 + 1)/(245*c**7) + 64*b*e**2
*x**2*sqrt(-c**2*x**2 + 1)/(2835*c**7) + 128*b*e**2*sqrt(-c**2*x**2 + 1)/(2
835*c**9), Ne(c, 0)), (a*(d**2*x**5/5 + 2*d*e*x**7/7 + e**2*x**9/9), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 314, normalized size of antiderivative = 1.30

$$\begin{aligned}\int x^4\left(d+ex^2\right)^2\left(a+b\arcsin(cx)\right)dx &= \frac{1}{9}\,ae^2x^9+\frac{2}{7}\,adex^7+\frac{1}{5}\,ad^2x^5\\ &+\frac{1}{75}\left(15\,x^5\arcsin\left(cx\right)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd^2\\ &+\frac{2}{245}\left(35\,x^7\arcsin\left(cx\right)+\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)\right.\\ &+\frac{1}{2835}\left(315\,x^9\arcsin\left(cx\right)+\left(\frac{35\sqrt{-c^2x^2+1}x^8}{c^2}+\frac{40\sqrt{-c^2x^2+1}x^6}{c^4}+\frac{48\sqrt{-c^2x^2+1}x^4}{c^6}+\frac{64\sqrt{-c^2x^2}}{c^8}\right.\right.\end{aligned}$$

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/9*a*e^2*x^9 + 2/7*a*d*e*x^7 + 1/5*a*d^2*x^5 + 1/75*(15*x^5*arcsin(c*x) +
(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*
x^2 + 1)/c^6)*c)*b*d^2 + 2/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*
x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*
sqrt(-c^2*x^2 + 1)/c^8)*c)*b*d*e + 1/2835*(315*x^9*arcsin(c*x) + (35*sqrt(-
c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1
)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)
*b*e^2
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 598 vs. $2(215) = 430$.

Time = 0.31 (sec) , antiderivative size = 598, normalized size of antiderivative = 2.48

$$\int x^4(d+ex^2)^2(a+b\arcsin(cx))\,dx = \frac{1}{9}ae^2x^9 + \frac{2}{7}adex^7 + \frac{1}{5}ad^2x^5 + \frac{(c^2x^2-1)^2bd^2x\arcsin(cx)}{5c^4} + \frac{2(c^2x^2-1)bd^2x\arcsin(cx)}{5c^4} + \frac{2(c^2x^2-1)^3bdex\arcsin(cx)}{7c^6} + \frac{bd^2x\arcsin(cx)}{5c^4} + \frac{6(c^2x^2-1)^2bdex\arcsin(cx)}{7c^6} + \frac{(c^2x^2-1)^4be^2x\arcsin(cx)}{9c^8} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}bd^2}{25c^5} + \frac{6(c^2x^2-1)bdex\arcsin(cx)}{7c^6} + \frac{4(c^2x^2-1)^3be^2x\arcsin(cx)}{9c^8} - \frac{2(-c^2x^2+1)^{\frac{3}{2}}bd^2}{15c^5} + \frac{2(c^2x^2-1)^3\sqrt{-c^2x^2+1}bde}{49c^7} + \frac{2bdex\arcsin(cx)}{7c^6} + \frac{2(c^2x^2-1)^2be^2x\arcsin(cx)}{3c^8} + \frac{\sqrt{-c^2x^2+1}bd^2}{5c^5} + \frac{6(c^2x^2-1)^2\sqrt{-c^2x^2+1}bde}{35c^7} + \frac{(c^2x^2-1)^4\sqrt{-c^2x^2+1}be^2}{81c^9} + \frac{4(c^2x^2-1)be^2x\arcsin(cx)}{9c^8} - \frac{2(-c^2x^2+1)^{\frac{3}{2}}bde}{7c^7} + \frac{4(c^2x^2-1)^3\sqrt{-c^2x^2+1}be^2}{63c^9} + \frac{be^2x\arcsin(cx)}{9c^8} + \frac{2\sqrt{-c^2x^2+1}bde}{7c^7} + \frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}be^2}{15c^9} - \frac{4(-c^2x^2+1)^{\frac{3}{2}}be^2}{27c^9} + \frac{\sqrt{-c^2x^2+1}be^2}{9c^9}$$

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/9*a*e^2*x^9 + 2/7*a*d*e*x^7 + 1/5*a*d^2*x^5 + 1/5*(c^2*x^2 - 1)^2*b*d^2*x
*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*d^2*x*arcsin(c*x)/c^4 + 2/7*(c^2*x^2
 - 1)^3*b*d*e*x*arcsin(c*x)/c^6 + 1/5*b*d^2*x*arcsin(c*x)/c^4 + 6/7*(c^2*x^
2 - 1)^2*b*d*e*x*arcsin(c*x)/c^6 + 1/9*(c^2*x^2 - 1)^4*b*e^2*x*arcsin(c*x)/
```

```
c^8 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^2/c^5 + 6/7*(c^2*x^2 - 1)
*b*d*e*x*arcsin(c*x)/c^6 + 4/9*(c^2*x^2 - 1)^3*b*e^2*x*arcsin(c*x)/c^8 - 2/
15*(-c^2*x^2 + 1)^(3/2)*b*d^2/c^5 + 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)
*b*d*e/c^7 + 2/7*b*d*e*x*arcsin(c*x)/c^6 + 2/3*(c^2*x^2 - 1)^2*b*e^2*x*arcs
in(c*x)/c^8 + 1/5*sqrt(-c^2*x^2 + 1)*b*d^2/c^5 + 6/35*(c^2*x^2 - 1)^2*sqrt(
-c^2*x^2 + 1)*b*d*e/c^7 + 1/81*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*e^2/c^9
 + 4/9*(c^2*x^2 - 1)*b*e^2*x*arcsin(c*x)/c^8 - 2/7*(-c^2*x^2 + 1)^(3/2)*b*d
*e/c^7 + 4/63*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^2/c^9 + 1/9*b*e^2*x*ar
csin(c*x)/c^8 + 2/7*sqrt(-c^2*x^2 + 1)*b*d*e/c^7 + 2/15*(c^2*x^2 - 1)^2*sqr
t(-c^2*x^2 + 1)*b*e^2/c^9 - 4/27*(-c^2*x^2 + 1)^(3/2)*b*e^2/c^9 + 1/9*sqrt(
-c^2*x^2 + 1)*b*e^2/c^9
```

Mupad [F(-1)]

Timed out.

$$\int x^4 (d+ex^2)^2 (a+b\arcsin(cx))\,dx = \int x^4\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^2\,dx$$

```
[In] int(x^4*(a + b*asin(c*x))*(d + e*x^2)^2,x)
[Out] int(x^4*(a + b*asin(c*x))*(d + e*x^2)^2, x)
```

3.606 $\int x^3(d+ex^2)^2(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 241

$$\int x^3(d+ex^2)^2(a+b\arcsin(cx))\,dx = \frac{b(288c^4d^2+320c^2de+105e^2)\,x\sqrt{1-c^2x^2}}{3072c^7} + \frac{b(288c^4d^2+320c^2de+105e^2)\,x^3\sqrt{1-c^2x^2}}{4608c^5} + \frac{be(64c^2d+21e)\,x^5\sqrt{1-c^2x^2}}{1152c^3} + \frac{be^2x^7\sqrt{1-c^2x^2}}{64c} - \frac{b(288c^4d^2+320c^2de+105e^2)\arcsin(cx)}{3072c^8} + \frac{1}{4}d^2x^4(a+b\arcsin(cx)) + \frac{1}{3}dex^6(a+b\arcsin(cx)) + \frac{1}{8}e^2x^8(a+b\arcsin(cx))$$

```
[Out] -1/3072*b*(288*c^4*d^2+320*c^2*d*e+105*e^2)*arcsin(c*x)/c^8+1/4*d^2*x^4*(a+
b*arcsin(c*x))+1/3*d*e*x^6*(a+b*arcsin(c*x))+1/8*e^2*x^8*(a+b*arcsin(c*x))+
1/3072*b*(288*c^4*d^2+320*c^2*d*e+105*e^2)*x*(-c^2*x^2+1)^(1/2)/c^7+1/4608*
b*(288*c^4*d^2+320*c^2*d*e+105*e^2)*x^3*(-c^2*x^2+1)^(1/2)/c^5+1/1152*b*e*(
64*c^2*d+21*e)*x^5*(-c^2*x^2+1)^(1/2)/c^3+1/64*b*e^2*x^7*(-c^2*x^2+1)^(1/2)
/c
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 241, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {272, 45, 4815, 12, 1281, 470, 327, 222}

$$\int x^3(d+ex^2)^2(a+b\arcsin(cx))\,dx=\frac{1}{4}d^2x^4(a+b\arcsin(cx))+\frac{1}{3}dex^6(a+b\arcsin(cx))+\frac{1}{8}e^2x^8(a+b\arcsin(cx))-\frac{b\arcsin(cx)\left(288c^4d^2+320c^2de+105e^2\right)}{3072c^8}+\frac{be^2x^7\sqrt{1-c^2x^2}}{64c}+\frac{bex^5\sqrt{1-c^2x^2}(64c^2d+21e)}{1152c^3}+\frac{bx\sqrt{1-c^2x^2}(288c^4d^2+320c^2de+105e^2)}{3072c^7}+\frac{bx^3\sqrt{1-c^2x^2}(288c^4d^2+320c^2de+105e^2)}{4608c^5}$$

```
[In] Int[x^3*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(288*c^4*d^2 + 320*c^2*d*e + 105*e^2)*x*Sqrt[1 - c^2*x^2])/(3072*c^7) +
(b*(288*c^4*d^2 + 320*c^2*d*e + 105*e^2)*x^3*Sqrt[1 - c^2*x^2])/(4608*c^5)
+ (b*e*(64*c^2*d + 21*e)*x^5*Sqrt[1 - c^2*x^2])/(1152*c^3) + (b*e^2*x^7*Sqr
t[1 - c^2*x^2])/(64*c) - (b*(288*c^4*d^2 + 320*c^2*d*e + 105*e^2)*ArcSin[c*
x])/(3072*c^8) + (d^2*x^4*(a + b*ArcSin[c*x]))/4 + (d*e*x^6*(a + b*ArcSin[c
*x]))/3 + (e^2*x^8*(a + b*ArcSin[c*x]))/8
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{1}{4}d^2x^4(a+b\arcsin(cx)) + \frac{1}{3}dex^6(a+b\arcsin(cx)) \\ &\quad + \frac{1}{8}e^2x^8(a+b\arcsin(cx)) - (bc)\int \frac{x^4(6d^2+8dex^2+3e^2x^4)}{24\sqrt{1-c^2x^2}}\,dx\end{aligned}$$

$$= \frac{1}{4}d^2x^4(a+b\arcsin(cx)) + \frac{1}{3}dex^6(a+b\arcsin(cx)) + \frac{1}{8}e^2x^8(a+b\arcsin(cx)) - \frac{1}{24}(bc)\int \frac{x^4(6d^2+8dex^2+3e^2x^4)}{\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{be^2x^7\sqrt{1-c^2x^2}}{64c} + \frac{1}{4}d^2x^4(a+b\arcsin(cx)) + \frac{1}{3}dex^6(a+b\arcsin(cx)) + \frac{1}{8}e^2x^8(a+b\arcsin(cx)) + \frac{b\int \frac{x^4(-48c^2d^2-e(64c^2d+21e)x^2)}{\sqrt{1-c^2x^2}}\,dx}{192c}$$

$$= \frac{be(64c^2d+21e)\,x^5\sqrt{1-c^2x^2}}{1152c^3} + \frac{be^2x^7\sqrt{1-c^2x^2}}{64c} + \frac{1}{4}d^2x^4(a+b\arcsin(cx)) + \frac{1}{3}dex^6(a+b\arcsin(cx)) + \frac{1}{8}e^2x^8(a+b\arcsin(cx)) + \frac{(b(-288c^4d^2-5e(64c^2d+21e)))\int \frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{1152c^3}$$

$$= \frac{b(288c^4d^2+5e(64c^2d+21e))\,x^3\sqrt{1-c^2x^2}}{4608c^5} + \frac{be(64c^2d+21e)\,x^5\sqrt{1-c^2x^2}}{1152c^3} + \frac{be^2x^7\sqrt{1-c^2x^2}}{64c} + \frac{1}{4}d^2x^4(a+b\arcsin(cx)) + \frac{1}{3}dex^6(a+b\arcsin(cx)) + \frac{1}{8}e^2x^8(a+b\arcsin(cx)) + \frac{(b(-288c^4d^2-5e(64c^2d+21e)))\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{1536c^5}$$

$$= \frac{b(288c^4d^2+5e(64c^2d+21e))\,x\sqrt{1-c^2x^2}}{3072c^7} + \frac{b(288c^4d^2+5e(64c^2d+21e))\,x^3\sqrt{1-c^2x^2}}{4608c^5} + \frac{be(64c^2d+21e)\,x^5\sqrt{1-c^2x^2}}{1152c^3} + \frac{be^2x^7\sqrt{1-c^2x^2}}{64c} + \frac{1}{4}d^2x^4(a+b\arcsin(cx)) + \frac{1}{3}dex^6(a+b\arcsin(cx)) + \frac{1}{8}e^2x^8(a+b\arcsin(cx)) + \frac{(b(-288c^4d^2-5e(64c^2d+21e)))\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{3072c^7}$$

$$= \frac{b(288c^4d^2+5e(64c^2d+21e))\,x\sqrt{1-c^2x^2}}{3072c^7} + \frac{b(288c^4d^2+5e(64c^2d+21e))\,x^3\sqrt{1-c^2x^2}}{4608c^5} + \frac{be(64c^2d+21e)\,x^5\sqrt{1-c^2x^2}}{1152c^3} + \frac{be^2x^7\sqrt{1-c^2x^2}}{64c} - \frac{b(288c^4d^2+5e(64c^2d+21e))\arcsin(cx)}{3072c^8} + \frac{1}{4}d^2x^4(a+b\arcsin(cx)) + \frac{1}{3}dex^6(a+b\arcsin(cx)) + \frac{1}{8}e^2x^8(a+b\arcsin(cx))$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 190, normalized size of antiderivative = 0.79

$$\int x^3 \left(d+ex^2\right)^2 (a+b\arcsin(cx))\,dx$$
$$= \frac{384ac^8x^4(6d^2+8dex^2+3e^2x^4)+bcx\sqrt{1-c^2x^2}(315e^2+30c^2e(32d+7ex^2)+8c^4(108d^2+80dex^2+21e^2x}{}$$

[In] Integrate[x^3*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]

[Out] (384*a*c^8*x^4*(6*d^2 + 8*d*e*x^2 + 3*e^2*x^4) + b*c*x*Sqrt[1 - c^2*x^2]*(3
15*e^2 + 30*c^2*e*(32*d + 7*e*x^2) + 8*c^4*(108*d^2 + 80*d*e*x^2 + 21*e^2*x
^4) + 16*c^6*(36*d^2*x^2 + 32*d*e*x^4 + 9*e^2*x^6)) + 3*b*(-288*c^4*d^2 - 3
20*c^2*d*e - 105*e^2 + 128*c^8*(6*d^2*x^4 + 8*d*e*x^6 + 3*e^2*x^8))*ArcSin[
c*x])/(9216*c^8)

Maple [A] (verified)

Time = 0.27 (sec) , antiderivative size = 293, normalized size of antiderivative = 1.22

method	result
parts	$a\left(\frac{1}{8}e^2x^8+\frac{1}{3}de\,x^6+\frac{1}{4}d^2x^4\right)+\frac{b\left(\frac{c^4\arcsin(cx)e^2x^8}{8}+\frac{c^4\arcsin(cx)ed\,x^6}{3}+\frac{\arcsin(cx)d^2c^4x^4}{4}-\frac{3e^2\left(-\frac{c^7x^7\sqrt{-c^2x^2+1}}{8}\right.}{}\right.}{}$
derivativedivides	$\frac{a\left(\frac{1}{4}d^2c^8x^4+\frac{1}{3}d\,c^8e\,x^6+\frac{1}{8}e^2c^8x^8\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)d^2c^8x^4}{4}+\frac{\arcsin(cx)d\,c^8e\,x^6}{3}+\frac{\arcsin(cx)e^2c^8x^8}{8}-\frac{e^2\left(-\frac{c^7x^7\sqrt{-c^2x^2+1}}{8}-7c^5x^5\sqrt{}\right.}{}\right.}{}$
default	$\frac{a\left(\frac{1}{4}d^2c^8x^4+\frac{1}{3}d\,c^8e\,x^6+\frac{1}{8}e^2c^8x^8\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)d^2c^8x^4}{4}+\frac{\arcsin(cx)d\,c^8e\,x^6}{3}+\frac{\arcsin(cx)e^2c^8x^8}{8}-\frac{e^2\left(-\frac{c^7x^7\sqrt{-c^2x^2+1}}{8}-7c^5x^5\sqrt{}\right.}{}\right.}{}$

[In] int(x^3*(e*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] a*(1/8*e^2*x^8+1/3*d*e*x^6+1/4*d^2*x^4)+b/c^4*(1/8*c^4*arcsin(c*x)*e^2*x^8+
1/3*c^4*arcsin(c*x)*e*d*x^6+1/4*arcsin(c*x)*d^2*c^4*x^4-1/24/c^4*(3*e^2*(-1
/8*c^7*x^7*(-c^2*x^2+1)^(1/2)-7/48*c^5*x^5*(-c^2*x^2+1)^(1/2)-35/192*c^3*x^
3*(-c^2*x^2+1)^(1/2)-35/128*c*x*(-c^2*x^2+1)^(1/2)+35/128*arcsin(c*x))+6*d^
2*c^4*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsi
n(c*x))+8*d*c^2*e*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x^2+1
)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))))

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 215, normalized size of antiderivative = 0.89

$$\int x^3 (d+ex^2)^2 (a+b\arcsin(cx))\, dx$$
$$= \frac{1152\, ac^8e^2x^8 + 3072\, ac^8dex^6 + 2304\, ac^8d^2x^4 + 3\,(384\, bc^8e^2x^8 + 1024\, bc^8dex^6 + 768\, bc^8d^2x^4 - 288\, bc^4d^2 -}{}$$

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/9216*(1152*a*c^8*e^2*x^8 + 3072*a*c^8*d*e*x^6 + 2304*a*c^8*d^2*x^4 + 3*(3
84*b*c^8*e^2*x^8 + 1024*b*c^8*d*e*x^6 + 768*b*c^8*d^2*x^4 - 288*b*c^4*d^2 -
 320*b*c^2*d*e - 105*b*e^2)*arcsin(c*x) + (144*b*c^7*e^2*x^7 + 8*(64*b*c^7*
d*e + 21*b*c^5*e^2)*x^5 + 2*(288*b*c^7*d^2 + 320*b*c^5*d*e + 105*b*c^3*e^2)
*x^3 + 3*(288*b*c^5*d^2 + 320*b*c^3*d*e + 105*b*c*e^2)*x)*sqrt(-c^2*x^2 + 1
))/c^8
```

Sympy [A] (verification not implemented)

Time = 1.01 (sec) , antiderivative size = 382, normalized size of antiderivative = 1.59

$$\int x^3 (d+ex^2)^2 (a+b\arcsin(cx))\, dx$$
$$= \begin{cases} \frac{ad^2x^4}{4} + \frac{adex^6}{3} + \frac{ae^2x^8}{8} + \frac{bd^2x^4 \operatorname{asin}(cx)}{4} + \frac{bdex^6 \operatorname{asin}(cx)}{3} + \frac{be^2x^8 \operatorname{asin}(cx)}{8} + \frac{bd^2x^3\sqrt{-c^2x^2+1}}{16c} + \frac{bdex^5\sqrt{-c^2x^2+1}}{18c} + \frac{be^2x^7\sqrt{}}{} \\ a\left(\frac{d^2x^4}{4} + \frac{dex^6}{3} + \frac{e^2x^8}{8}\right) \end{cases}$$

```
[In] integrate(x**3*(e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x**4/4 + a*d*e*x**6/3 + a*e**2*x**8/8 + b*d**2*x**4*asin(
c*x)/4 + b*d*e*x**6*asin(c*x)/3 + b*e**2*x**8*asin(c*x)/8 + b*d**2*x**3*sqr
t(-c**2*x**2 + 1)/(16*c) + b*d*e*x**5*sqrt(-c**2*x**2 + 1)/(18*c) + b*e**2*
x**7*sqrt(-c**2*x**2 + 1)/(64*c) + 3*b*d**2*x*sqrt(-c**2*x**2 + 1)/(32*c**3
) + 5*b*d*e*x**3*sqrt(-c**2*x**2 + 1)/(72*c**3) + 7*b*e**2*x**5*sqrt(-c**2*
x**2 + 1)/(384*c**3) - 3*b*d**2*asin(c*x)/(32*c**4) + 5*b*d*e*x*sqrt(-c**2*
x**2 + 1)/(48*c**5) + 35*b*e**2*x**3*sqrt(-c**2*x**2 + 1)/(1536*c**5) - 5*b
*d*e*asin(c*x)/(48*c**6) + 35*b*e**2*x*sqrt(-c**2*x**2 + 1)/(1024*c**7) - 3
5*b*e**2*asin(c*x)/(1024*c**8), Ne(c, 0)), (a*(d**2*x**4/4 + d*e*x**6/3 + e
**2*x**8/8), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 284, normalized size of antiderivative = 1.18

$$\int x^3 (d + ex^2)^2 (a + b \arcsin(cx))\, dx = \frac{1}{8} ae^2x^8 + \frac{1}{3} adex^6 + \frac{1}{4} ad^2x^4 + \frac{1}{32} \left(8\, x^4 \arcsin{(cx)} + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3 \arcsin{(cx)}}{c^5}\right) c\right) bd^2 + \frac{1}{144} \left(48\, x^6 \arcsin{(cx)} + \left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2} + \frac{10\sqrt{-c^2x^2+1}x^3}{c^4} + \frac{15\sqrt{-c^2x^2+1}x}{c^6} - \frac{15 \arcsin{(cx)}}{c^7}\right) c \right. + \frac{1}{3072} \left(384\, x^8 \arcsin{(cx)} + \left(\frac{48\sqrt{-c^2x^2+1}x^7}{c^2} + \frac{56\sqrt{-c^2x^2+1}x^5}{c^4} + \frac{70\sqrt{-c^2x^2+1}x^3}{c^6} + \frac{105\sqrt{-c^2x^2}}{c^8}\right.\right.$$

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/8*a*e^2*x^8 + 1/3*a*d*e*x^6 + 1/4*a*d^2*x^4 + 1/32*(8*x^4*arcsin(c*x) + (
2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c
^5)*c)*b*d^2 + 1/144*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 +
10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x
)/c^7)*c)*b*d*e + 1/3072*(384*x^8*arcsin(c*x) + (48*sqrt(-c^2*x^2 + 1)*x^7/
c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x^2 + 1)*x^3/c^6 + 105*s
qrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c*x)/c^9)*c)*b*e^2
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 498 vs. 2(217) = 434.

Time = 0.29 (sec) , antiderivative size = 498, normalized size of antiderivative = 2.07

$$\int x^3(d+ex^2)^2(a+b\arcsin(cx))\,dx = \frac{1}{8}ae^2x^8 + \frac{1}{3}adex^6 + \frac{1}{4}ad^2x^4 - \frac{(-c^2x^2+1)^{\frac{3}{2}}bd^2x}{16\,c^3} + \frac{(c^2x^2-1)^2bd^2\arcsin(cx)}{4\,c^4} + \frac{5\sqrt{-c^2x^2+1}bd^2x}{32\,c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}bdex}{18\,c^5} + \frac{(c^2x^2-1)bd^2\arcsin(cx)}{2\,c^4} + \frac{(c^2x^2-1)^3bde\arcsin(cx)}{3\,c^6} - \frac{13(-c^2x^2+1)^{\frac{3}{2}}bdex}{72\,c^5} + \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}be^2x}{64\,c^7} + \frac{5\,bd^2\arcsin(cx)}{32\,c^4} + \frac{(c^2x^2-1)^2bde\arcsin(cx)}{c^6} + \frac{(c^2x^2-1)^4be^2\arcsin(cx)}{8\,c^8} + \frac{11\sqrt{-c^2x^2+1}bdex}{48\,c^5} + \frac{25(c^2x^2-1)^2\sqrt{-c^2x^2+1}be^2x}{384\,c^7} + \frac{(c^2x^2-1)bde\arcsin(cx)}{c^6} + \frac{(c^2x^2-1)^3be^2\arcsin(cx)}{2\,c^8} - \frac{163(-c^2x^2+1)^{\frac{3}{2}}be^2x}{1536\,c^7} + \frac{11\,bde\arcsin(cx)}{48\,c^6} + \frac{3(c^2x^2-1)^2be^2\arcsin(cx)}{4\,c^8} + \frac{93\sqrt{-c^2x^2+1}be^2x}{1024\,c^7} + \frac{(c^2x^2-1)be^2\arcsin(cx)}{2\,c^8} + \frac{93\,be^2\arcsin(cx)}{1024\,c^8}$$

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/8*a*e^2*x^8 + 1/3*a*d*e*x^6 + 1/4*a*d^2*x^4 - 1/16*(-c^2*x^2 + 1)^(3/2)*b
*d^2*x/c^3 + 1/4*(c^2*x^2 - 1)^2*b*d^2*arcsin(c*x)/c^4 + 5/32*sqrt(-c^2*x^2
 + 1)*b*d^2*x/c^3 + 1/18*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e*x/c^5 + 1
/2*(c^2*x^2 - 1)*b*d^2*arcsin(c*x)/c^4 + 1/3*(c^2*x^2 - 1)^3*b*d*e*arcsin(c
*x)/c^6 - 13/72*(-c^2*x^2 + 1)^(3/2)*b*d*e*x/c^5 + 1/64*(c^2*x^2 - 1)^3*sqr
t(-c^2*x^2 + 1)*b*e^2*x/c^7 + 5/32*b*d^2*arcsin(c*x)/c^4 + (c^2*x^2 - 1)^2*
b*d*e*arcsin(c*x)/c^6 + 1/8*(c^2*x^2 - 1)^4*b*e^2*arcsin(c*x)/c^8 + 11/48*s
qrt(-c^2*x^2 + 1)*b*d*e*x/c^5 + 25/384*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b
*e^2*x/c^7 + (c^2*x^2 - 1)*b*d*e*arcsin(c*x)/c^6 + 1/2*(c^2*x^2 - 1)^3*b*e^
2*arcsin(c*x)/c^8 - 163/1536*(-c^2*x^2 + 1)^(3/2)*b*e^2*x/c^7 + 11/48*b*d*e
```

```
*arcsin(c*x)/c^6 + 3/4*(c^2*x^2 - 1)^2*b*e^2*arcsin(c*x)/c^8 + 93/1024*sqrt
(-c^2*x^2 + 1)*b*e^2*x/c^7 + 1/2*(c^2*x^2 - 1)*b*e^2*arcsin(c*x)/c^8 + 93/1
024*b*e^2*arcsin(c*x)/c^8
```

Mupad [F(-1)]

Timed out.

$$\int x^3 \left(d+ex^2\right)^2 (a+b\arcsin(cx))\,dx=\int x^3\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^2\,dx$$

```
[In] int(x^3*(a + b*asin(c*x))*(d + e*x^2)^2,x)
[Out] int(x^3*(a + b*asin(c*x))*(d + e*x^2)^2, x)
```

3.607 $\int x^2(d+ex^2)^2 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 198

$$\begin{aligned}\int x^2(d+ex^2)^2 (a+b\arcsin(cx))\,dx &= \frac{b(35c^4d^2+42c^2de+15e^2)\sqrt{1-c^2x^2}}{105c^7} - \frac{b(35c^4d^2+84c^2de+45e^2)(1-c^2x^2)^{3/2}}{315c^7} \\ &\quad + \frac{be(14c^2d+15e)(1-c^2x^2)^{5/2}}{175c^7} - \frac{be^2(1-c^2x^2)^{7/2}}{49c^7} \\ &\quad + \frac{1}{3}d^2x^3(a+b\arcsin(cx)) + \frac{2}{5}dex^5(a+b\arcsin(cx)) + \frac{1}{7}e^2x^7(a+b\arcsin(cx))\end{aligned}$$

```
[Out] -1/315*b*(35*c^4*d^2+84*c^2*d*e+45*e^2)*(-c^2*x^2+1)^(3/2)/c^7+1/175*b*e*(1
4*c^2*d+15*e)*(-c^2*x^2+1)^(5/2)/c^7-1/49*b*e^2*(-c^2*x^2+1)^(7/2)/c^7+1/3*
d^2*x^3*(a+b*arcsin(c*x))+2/5*d*e*x^5*(a+b*arcsin(c*x))+1/7*e^2*x^7*(a+b*ar
csin(c*x))+1/105*b*(35*c^4*d^2+42*c^2*d*e+15*e^2)*(-c^2*x^2+1)^(1/2)/c^7
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 198, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {276, 4815, 12, 1265, 785}

$$\int x^2(d+ex^2)^2(a+b\arcsin(cx))\,dx=\frac{1}{3}d^2x^3(a+b\arcsin(cx))+\frac{2}{5}dex^5(a+b\arcsin(cx))+\frac{1}{7}e^2x^7(a+b\arcsin(cx))+\frac{be(1-c^2x^2)^{5/2}(14c^2d+15e)}{175c^7}-\frac{be^2(1-c^2x^2)^{7/2}}{49c^7}-\frac{b(1-c^2x^2)^{3/2}(35c^4d^2+84c^2de+45e^2)}{315c^7}+\frac{b\sqrt{1-c^2x^2}(35c^4d^2+42c^2de+15e^2)}{105c^7}$$

```
[In] Int[x^2*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(35*c^4*d^2 + 42*c^2*d*e + 15*e^2)*Sqrt[1 - c^2*x^2])/(105*c^7) - (b*(35
*c^4*d^2 + 84*c^2*d*e + 45*e^2)*(1 - c^2*x^2)^(3/2))/(315*c^7) + (b*e*(14*c
^2*d + 15*e)*(1 - c^2*x^2)^(5/2))/(175*c^7) - (b*e^2*(1 - c^2*x^2)^(7/2))/(
49*c^7) + (d^2*x^3*(a + b*ArcSin[c*x]))/3 + (2*d*e*x^5*(a + b*ArcSin[c*x]))
/5 + (e^2*x^7*(a + b*ArcSin[c*x]))/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 785

```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (
c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g*x)*
(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && NeQ[b^
2 - 4*a*c, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0] && IntegerQ[m]))
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
```

```
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{3}d^2x^3(a+b\arcsin(cx))+\frac{2}{5}dex^5(a+b\arcsin(cx)) \\
&\quad+\frac{1}{7}e^2x^7(a+b\arcsin(cx))-(bc)\int\frac{x^3(35d^2+42dex^2+15e^2x^4)}{105\sqrt{1-c^2x^2}}\,dx \\
&= \frac{1}{3}d^2x^3(a+b\arcsin(cx))+\frac{2}{5}dex^5(a+b\arcsin(cx)) \\
&\quad+\frac{1}{7}e^2x^7(a+b\arcsin(cx))-\frac{1}{105}(bc)\int\frac{x^3(35d^2+42dex^2+15e^2x^4)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{1}{3}d^2x^3(a+b\arcsin(cx))+\frac{2}{5}dex^5(a+b\arcsin(cx))+\frac{1}{7}e^2x^7(a+b\arcsin(cx)) \\
&\quad-\frac{1}{210}(bc)\text{Subst}\left(\int\frac{x(35d^2+42dex+15e^2x^2)}{\sqrt{1-c^2x}}\,dx,x,x^2\right) \\
&= \frac{1}{3}d^2x^3(a+b\arcsin(cx))+\frac{2}{5}dex^5(a+b\arcsin(cx)) \\
&\quad+\frac{1}{7}e^2x^7(a+b\arcsin(cx))-\frac{1}{210}(bc)\text{Subst}\left(\int\left(\frac{35c^4d^2+42c^2de+15e^2}{c^6\sqrt{1-c^2x}}\right.\right. \\
&\qquad+\frac{(-35c^4d^2-84c^2de-45e^2)\sqrt{1-c^2x}}{c^6}+\frac{3e(14c^2d+15e)(1-c^2x)^{3/2}}{c^6} \\
&\qquad\left.\left.-\frac{15e^2(1-c^2x)^{5/2}}{c^6}\right)\,dx,x,x^2\right) \\
&= \frac{b(35c^4d^2+42c^2de+15e^2)\sqrt{1-c^2x^2}}{105c^7}-\frac{b(35c^4d^2+84c^2de+45e^2)(1-c^2x^2)^{3/2}}{315c^7} \\
&\quad+\frac{be(14c^2d+15e)(1-c^2x^2)^{5/2}}{175c^7}-\frac{be^2(1-c^2x^2)^{7/2}}{49c^7} \\
&\quad+\frac{1}{3}d^2x^3(a+b\arcsin(cx))+\frac{2}{5}dex^5(a+b\arcsin(cx))+\frac{1}{7}e^2x^7(a+b\arcsin(cx))
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 158, normalized size of antiderivative = 0.80

$$\int x^2 (d + ex^2)^2 (a + b \arcsin(cx)) \, dx$$
$$= \frac{105ax^3(35d^2 + 42dex^2 + 15e^2x^4) + \frac{b\sqrt{1-c^2x^2}(720e^2+24c^2e(98d+15ex^2)+2c^4(1225d^2+588dex^2+135e^2x^4)+c^6(1225d^2x^2+882dex^4}{c^7}}{11025}$$

[In] Integrate[x^2*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]

[Out] (105*a*x^3*(35*d^2 + 42*d*e*x^2 + 15*e^2*x^4) + (b*Sqrt[1 - c^2*x^2]*(720*e^2 + 24*c^2*e*(98*d + 15*e*x^2) + 2*c^4*(1225*d^2 + 588*d*e*x^2 + 135*e^2*x^4) + c^6*(1225*d^2*x^2 + 882*d*e*x^4 + 225*e^2*x^6)))/c^7 + 105*b*x^3*(35*d^2 + 42*d*e*x^2 + 15*e^2*x^4)*ArcSin[c*x])/11025

Maple [A] (verified)

Time = 0.35 (sec) , antiderivative size = 269, normalized size of antiderivative = 1.36

method	result
parts	$a\left(\frac{1}{7}e^2x^7 + \frac{2}{5}de\,x^5 + \frac{1}{3}d^2x^3\right) + \frac{b\left(\frac{c^3\arcsin(cx)e^2x^7}{7} + \frac{2c^3\arcsin(cx)ed\,x^5}{5} + \frac{\arcsin(cx)d^2c^3x^3}{3} - \frac{15e^2\left(-\frac{c^6x^6\sqrt{-c^2x^2}}{7}\right.}{}\right.}{}$
derivativedivides	$\frac{a\left(\frac{1}{3}d^2c^7x^3+\frac{2}{5}d\,c^7e\,x^5+\frac{1}{7}e^2c^7x^7\right)}{c^4} + \frac{b\left(\frac{\arcsin(cx)d^2c^7x^3}{3} + \frac{2\arcsin(cx)d\,c^7e\,x^5}{5} + \frac{\arcsin(cx)e^2c^7x^7}{7} - \frac{e^2\left(-\frac{c^6x^6\sqrt{-c^2x^2+1}}{7} - 6c^4x^4\right.}{}\right.}{}$
default	$\frac{a\left(\frac{1}{3}d^2c^7x^3+\frac{2}{5}d\,c^7e\,x^5+\frac{1}{7}e^2c^7x^7\right)}{c^4} + \frac{b\left(\frac{\arcsin(cx)d^2c^7x^3}{3} + \frac{2\arcsin(cx)d\,c^7e\,x^5}{5} + \frac{\arcsin(cx)e^2c^7x^7}{7} - \frac{e^2\left(-\frac{c^6x^6\sqrt{-c^2x^2+1}}{7} - 6c^4x^4\right.}{}\right.}{}$

[In] int(x^2*(e*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] a*(1/7*e^2*x^7+2/5*d*e*x^5+1/3*d^2*x^3)+b/c^3*(1/7*c^3*arcsin(c*x)*e^2*x^7+2/5*c^3*arcsin(c*x)*e*d*x^5+1/3*arcsin(c*x)*d^2*c^3*x^3-1/105/c^4*(15*e^2*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2))+35*d^2*c^4*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+42*d*c^2*e*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))))

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 186, normalized size of antiderivative = 0.94

$$\int x^2(d+ex^2)^2(a+b\arcsin(cx))\,dx$$
$$= \frac{1575\,ac^7e^2x^7+4410\,ac^7dex^5+3675\,ac^7d^2x^3+105\,(15\,bc^7e^2x^7+42\,bc^7dex^5+35\,bc^7d^2x^3)\arcsin{(cx)}+(2}{}$$

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/11025*(1575*a*c^7*e^2*x^7 + 4410*a*c^7*d*e*x^5 + 3675*a*c^7*d^2*x^3 + 105
*(15*b*c^7*e^2*x^7 + 42*b*c^7*d*e*x^5 + 35*b*c^7*d^2*x^3)*arcsin(c*x) + (22
5*b*c^6*e^2*x^6 + 2450*b*c^4*d^2 + 2352*b*c^2*d*e + 18*(49*b*c^6*d*e + 15*b
*c^4*e^2)*x^4 + 720*b*e^2 + (1225*b*c^6*d^2 + 1176*b*c^4*d*e + 360*b*c^2*e^
2)*x^2)*sqrt(-c^2*x^2 + 1))/c^7
```

Sympy [A] (verification not implemented)

Time = 0.67 (sec) , antiderivative size = 333, normalized size of antiderivative = 1.68

$$\int x^2(d+ex^2)^2(a+b\arcsin(cx))\,dx$$
$$= \begin{cases} \frac{ad^2x^3}{3}+\frac{2adex^5}{5}+\frac{ae^2x^7}{7}+\frac{bd^2x^3\operatorname{asin}{(cx)}}{3}+\frac{2bdex^5\operatorname{asin}{(cx)}}{5}+\frac{be^2x^7\operatorname{asin}{(cx)}}{7}+\frac{bd^2x^2\sqrt{-c^2x^2+1}}{9c}+\frac{2bdex^4\sqrt{-c^2x^2+1}}{25c}+\frac{be^2 }{} \\ a\left(\frac{d^2x^3}{3}+\frac{2dex^5}{5}+\frac{e^2x^7}{7}\right) \end{cases}$$

```
[In] integrate(x**2*(e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x**3/3 + 2*a*d*e*x**5/5 + a*e**2*x**7/7 + b*d**2*x**3*asi
n(c*x)/3 + 2*b*d*e*x**5*asin(c*x)/5 + b*e**2*x**7*asin(c*x)/7 + b*d**2*x**2
*sqrt(-c**2*x**2 + 1)/(9*c) + 2*b*d*e*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*
e**2*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + 2*b*d**2*sqrt(-c**2*x**2 + 1)/(9*c*
*3) + 8*b*d*e*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 6*b*e**2*x**4*sqrt(-c**
2*x**2 + 1)/(245*c**3) + 16*b*d*e*sqrt(-c**2*x**2 + 1)/(75*c**5) + 8*b*e**2
*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e**2*sqrt(-c**2*x**2 + 1)/(245
*c**7), Ne(c, 0)), (a*(d**2*x**3/3 + 2*d*e*x**5/5 + e**2*x**7/7), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 253, normalized size of antiderivative = 1.28

$$\int x^2 \left(d+e x^2\right)^2 (a+b \arcsin(cx)) \, dx = \frac{1}{7} a e^2 x^7 + \frac{2}{5} a d e x^5 + \frac{1}{3} a d^2 x^3 + \frac{1}{9} \left(3 x^3 \arcsin(cx) + c\left(\frac{\sqrt{-c^2 x^2+1} x^2}{c^2} + \frac{2 \sqrt{-c^2 x^2+1}}{c^4}\right)\right) b d^2 + \frac{2}{75} \left(15 x^5 \arcsin(cx) + \left(\frac{3 \sqrt{-c^2 x^2+1} x^4}{c^2} + \frac{4 \sqrt{-c^2 x^2+1} x^2}{c^4} + \frac{8 \sqrt{-c^2 x^2+1}}{c^6}\right) c\right) b d e + \frac{1}{245} \left(35 x^7 \arcsin(cx) + \left(\frac{5 \sqrt{-c^2 x^2+1} x^6}{c^2} + \frac{6 \sqrt{-c^2 x^2+1} x^4}{c^4} + \frac{8 \sqrt{-c^2 x^2+1} x^2}{c^6} + \frac{16 \sqrt{-c^2 x^2+1}}{c^8}\right) c\right.$$

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/7*a*e^2*x^7 + 2/5*a*d*e*x^5 + 1/3*a*d^2*x^3 + 1/9*(3*x^3*arcsin(c*x) + c*
(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^2 + 2/75*(15*x
^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c
^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d*e + 1/245*(35*x^7*arcsin(c*x) + (5*sq
rt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 +
 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*e^2
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 429 vs. 2(176) = 352.

Time = 0.28 (sec) , antiderivative size = 429, normalized size of antiderivative = 2.17

$$\int x^2 (d+ex^2)^2 (a+b\arcsin(cx))\,dx = \frac{1}{7}ae^2x^7 + \frac{2}{5}adex^5 + \frac{1}{3}ad^2x^3 + \frac{(c^2x^2-1)bd^2x\arcsin(cx)}{3c^2} + \frac{bd^2x\arcsin(cx)}{3c^2} + \frac{2(c^2x^2-1)^2bdex\arcsin(cx)}{5c^4} + \frac{4(c^2x^2-1)bdex\arcsin(cx)}{5c^4} + \frac{(c^2x^2-1)^3be^2x\arcsin(cx)}{7c^6} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bd^2}{9c^3} + \frac{2bdex\arcsin(cx)}{5c^4} + \frac{3(c^2x^2-1)^2be^2x\arcsin(cx)}{7c^6} + \frac{\sqrt{-c^2x^2+1}bd^2}{3c^3} + \frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}bde}{25c^5} + \frac{3(c^2x^2-1)be^2x\arcsin(cx)}{7c^6} - \frac{4(-c^2x^2+1)^{\frac{3}{2}}bde}{15c^5} + \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}be^2}{49c^7} + \frac{be^2x\arcsin(cx)}{7c^6} + \frac{2\sqrt{-c^2x^2+1}bde}{5c^5} + \frac{3(c^2x^2-1)^2\sqrt{-c^2x^2+1}be^2}{35c^7} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^2}{7c^7} + \frac{\sqrt{-c^2x^2+1}be^2}{7c^7}$$

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/7*a*e^2*x^7 + 2/5*a*d*e*x^5 + 1/3*a*d^2*x^3 + 1/3*(c^2*x^2 - 1)*b*d^2*x*a
rcsin(c*x)/c^2 + 1/3*b*d^2*x*arcsin(c*x)/c^2 + 2/5*(c^2*x^2 - 1)^2*b*d*e*x*
arcsin(c*x)/c^4 + 4/5*(c^2*x^2 - 1)*b*d*e*x*arcsin(c*x)/c^4 + 1/7*(c^2*x^2
- 1)^3*b*e^2*x*arcsin(c*x)/c^6 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d^2/c^3 + 2/5*b
*d*e*x*arcsin(c*x)/c^4 + 3/7*(c^2*x^2 - 1)^2*b*e^2*x*arcsin(c*x)/c^6 + 1/3*
sqrt(-c^2*x^2 + 1)*b*d^2/c^3 + 2/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*
e/c^5 + 3/7*(c^2*x^2 - 1)*b*e^2*x*arcsin(c*x)/c^6 - 4/15*(-c^2*x^2 + 1)^(3/
2)*b*d*e/c^5 + 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^2/c^7 + 1/7*b*e^
2*x*arcsin(c*x)/c^6 + 2/5*sqrt(-c^2*x^2 + 1)*b*d*e/c^5 + 3/35*(c^2*x^2 - 1)
^2*sqrt(-c^2*x^2 + 1)*b*e^2/c^7 - 1/7*(-c^2*x^2 + 1)^(3/2)*b*e^2/c^7 + 1/7*
sqrt(-c^2*x^2 + 1)*b*e^2/c^7
```

Mupad [F(-1)]

Timed out.

$$\int x^2 (d+ex^2)^2 (a+b\arcsin(cx))\,dx = \int x^2 (a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^2 dx$$

```
[In] int(x^2*(a + b*asin(c*x))*(d + e*x^2)^2,x)
[Out] int(x^2*(a + b*asin(c*x))*(d + e*x^2)^2, x)
```

3.608 $\int x(d+ex^2)^2(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 183

$$\int x(d+ex^2)^2(a+b\arcsin(cx))\,dx = \frac{b(44c^4d^2+44c^2de+15e^2)\,x\sqrt{1-c^2x^2}}{288c^5} + \frac{5b(2c^2d+e)\,x\sqrt{1-c^2x^2}(d+ex^2)}{144c^3} + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^2}{36c} - \frac{b(2c^2d+e)\,(8c^4d^2+8c^2de+5e^2)\arcsin(cx)}{96c^6e} + \frac{(d+ex^2)^3\,(a+b\arcsin(cx))}{6e}$$

```
[Out] -1/96*b*(2*c^2*d+e)*(8*c^4*d^2+8*c^2*d*e+5*e^2)*arcsin(c*x)/c^6/e+1/6*(e*x^
2+d)^3*(a+b*arcsin(c*x))/e+1/288*b*(44*c^4*d^2+44*c^2*d*e+15*e^2)*x*(-c^2*x
^2+1)^(1/2)/c^5+5/144*b*(2*c^2*d+e)*x*(e*x^2+d)*(-c^2*x^2+1)^(1/2)/c^3+1/36
*b*x*(e*x^2+d)^2*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.263$, Rules used

$= \{4813, 427, 542, 396, 222\}$

$$\int x(d+ex^2)^2(a+b\arcsin(cx))\,dx = \frac{(d+ex^2)^3(a+b\arcsin(cx))}{6e} - \frac{b\arcsin(cx)(2c^2d+e)(8c^4d^2+8c^2de+5e^2)}{96c^6e} + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^2}{36c} + \frac{5bx\sqrt{1-c^2x^2}(2c^2d+e)(d+ex^2)}{144c^3} + \frac{bx\sqrt{1-c^2x^2}(44c^4d^2+44c^2de+15e^2)}{288c^5}$$

```
[In] Int[x*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(44*c^4*d^2 + 44*c^2*d*e + 15*e^2)*x*Sqrt[1 - c^2*x^2])/(288*c^5) + (5*b
*(2*c^2*d + e)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2))/(144*c^3) + (b*x*Sqrt[1 - c
^2*x^2]*(d + e*x^2)^2)/(36*c) - (b*(2*c^2*d + e)*(8*c^4*d^2 + 8*c^2*d*e + 5
*e^2)*ArcSin[c*x])/(96*c^6*e) + ((d + e*x^2)^3*(a + b*ArcSin[c*x]))/(6*e)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 427

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[d*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^(q - 1)/(b*(n*(p + q) + 1))),
x] + Dist[1/(b*(n*(p + q) + 1)), Int[(a + b*x^n)^p*(c + d*x^n)^(q - 2)*Simp
[c*(b*c*(n*(p + q) + 1) - a*d) + d*(b*c*(n*(p + 2*q - 1) + 1) - a*d*(n*(q -
 1) + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d,
 0] && GtQ[q, 1] && NeQ[n*(p + q) + 1, 0] &&  !IGtQ[p, 1] && IntBinomialQ[a
, b, c, d, n, p, q, x]
```

Rule 542

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[f*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^q/(
b*(n*(p + q + 1) + 1))), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
```

```
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{(d+ex^2)^3(a+b\arcsin(cx))}{6e}-\frac{(bc)\int\frac{(d+ex^2)^3}{\sqrt{1-c^2x^2}}\,dx}{6e}\\
&= \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^2}{36c}+\frac{(d+ex^2)^3(a+b\arcsin(cx))}{6e}+\frac{b\int\frac{(d+ex^2)(-d(6c^2d+e)-5e(2c^2d+e)x^2)}{\sqrt{1-c^2x^2}}\,dx}{36ce}\\
&= \frac{5b(2c^2d+e)x\sqrt{1-c^2x^2}(d+ex^2)}{144c^3}+\frac{bx\sqrt{1-c^2x^2}(d+ex^2)^2}{36c}\\
&\quad+\frac{(d+ex^2)^3(a+b\arcsin(cx))}{6e}-\frac{b\int\frac{d(24c^4d^2+14c^2de+5e^2)+e(44c^4d^2+44c^2de+15e^2)x^2}{\sqrt{1-c^2x^2}}\,dx}{144c^3e}\\
&= \frac{b(44c^4d^2+44c^2de+15e^2)x\sqrt{1-c^2x^2}}{288c^5}+\frac{5b(2c^2d+e)x\sqrt{1-c^2x^2}(d+ex^2)}{144c^3}\\
&\quad+\frac{bx\sqrt{1-c^2x^2}(d+ex^2)^2}{36c}+\frac{(d+ex^2)^3(a+b\arcsin(cx))}{6e}\\
&\quad-\frac{(b(2c^2d+e)(8c^4d^2+8c^2de+5e^2))\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{96c^5e}\\
&= \frac{b(44c^4d^2+44c^2de+15e^2)x\sqrt{1-c^2x^2}}{288c^5}\\
&\quad+\frac{5b(2c^2d+e)x\sqrt{1-c^2x^2}(d+ex^2)}{144c^3}+\frac{bx\sqrt{1-c^2x^2}(d+ex^2)^2}{36c}\\
&\quad-\frac{b(2c^2d+e)(8c^4d^2+8c^2de+5e^2)\arcsin(cx)}{96c^6e}+\frac{(d+ex^2)^3(a+b\arcsin(cx))}{6e}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.87

$$\int x\left(d+ex^2\right)^2\left(a+b\arcsin(cx)\right)dx$$
$$=\frac{cx\left(48ac^5x(3d^2+3dex^2+e^2x^4)+b\sqrt{1-c^2x^2}(15e^2+2c^2e(27d+5ex^2)+4c^4(18d^2+9dex^2+2e^2x^4))\right)+3\cdots}{288c^6}$$

[In] Integrate[x*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]

[Out] (c*x*(48*a*c^5*x*(3*d^2 + 3*d*e*x^2 + e^2*x^4) + b*Sqrt[1 - c^2*x^2]*(15*e^2 + 2*c^2*e*(27*d + 5*e*x^2) + 4*c^4*(18*d^2 + 9*d*e*x^2 + 2*e^2*x^4))) + 3*b*(-24*c^4*d^2 - 18*c^2*d*e - 5*e^2 + 16*c^6*(3*d^2*x^2 + 3*d*e*x^4 + e^2*x^6))*ArcSin[c*x])/(288*c^6)

Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 253, normalized size of antiderivative = 1.38

method	result
parts	$\frac{a(ex^2+d)^3}{6e}+\frac{b\left(\frac{c^2e^2\arcsin(cx)x^6}{6}+\frac{c^2e\arcsin(cx)x^4d}{2}+\frac{\arcsin(cx)c^2x^2d^2}{2}+\frac{c^2\arcsin(cx)d^3}{6e}-\frac{c^6d^3\arcsin(cx)+e^3\left(-\frac{c^5x^5\sqrt{-c^2}}{6}\cdots\right.}{\cdots}\cdots\right.}{\cdots}$
derivativedivides	$\frac{\frac{a(c^2ex^2+c^2d)^3}{6c^4e}+b\left(\frac{\arcsin(cx)c^6d^3}{6e}+\frac{\arcsin(cx)c^6d^2x^2}{2}+\frac{e\arcsin(cx)c^6dx^4}{2}+\frac{e^2\arcsin(cx)c^6x^6}{6}-\frac{c^6d^3\arcsin(cx)+e^3\left(-\frac{c^5x^5\sqrt{-c^2}}{6}\cdots\right.}{\cdots}\cdots\right.}{\cdots}$
default	$\frac{\frac{a(c^2ex^2+c^2d)^3}{6c^4e}+b\left(\frac{\arcsin(cx)c^6d^3}{6e}+\frac{\arcsin(cx)c^6d^2x^2}{2}+\frac{e\arcsin(cx)c^6dx^4}{2}+\frac{e^2\arcsin(cx)c^6x^6}{6}-\frac{c^6d^3\arcsin(cx)+e^3\left(-\frac{c^5x^5\sqrt{-c^2}}{6}\cdots\right.}{\cdots}\cdots\right.}{\cdots}$

[In] int(x*(e*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] 1/6*a*(e*x^2+d)^3/e+b/c^2*(1/6*c^2*e^2*arcsin(c*x)*x^6+1/2*c^2*e*arcsin(c*x)*x^4*d+1/2*arcsin(c*x)*c^2*x^2*d^2+1/6*c^2/e*arcsin(c*x)*d^3-1/6/c^4/e*(c^6*d^3*arcsin(c*x)+e^3*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))+3*d^2*c^4*e*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+3*d*c^2*e^2*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))))

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 183, normalized size of antiderivative = 1.00

$$\int x(d+ex^2)^2(a+b\arcsin(cx))\,dx$$
$$=\frac{48\,ac^6e^2x^6+144\,ac^6dex^4+144\,ac^6d^2x^2+3\,(16\,bc^6e^2x^6+48\,bc^6dex^4+48\,bc^6d^2x^2-24\,bc^4d^2-18\,bc^2de-}{288}$$

[In] integrate(x*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")

[Out] 1/288*(48*a*c^6*e^2*x^6 + 144*a*c^6*d*e*x^4 + 144*a*c^6*d^2*x^2 + 3*(16*b*c^6*e^2*x^6 + 48*b*c^6*d*e*x^4 + 48*b*c^6*d^2*x^2 - 24*b*c^4*d^2 - 18*b*c^2*d*e - 5*b*e^2)*arcsin(c*x) + (8*b*c^5*e^2*x^5 + 2*(18*b*c^5*d*e + 5*b*c^3*e^2)*x^3 + 3*(24*b*c^5*d^2 + 18*b*c^3*d*e + 5*b*c*e^2)*x)*sqrt(-c^2*x^2 + 1))/c^6

Sympy [A] (verification not implemented)

Time = 0.59 (sec) , antiderivative size = 299, normalized size of antiderivative = 1.63

$$\int x(d+ex^2)^2(a+b\arcsin(cx))\,dx$$
$$=\begin{cases}\frac{ad^2x^2}{2}+\frac{adex^4}{2}+\frac{ae^2x^6}{6}+\frac{bd^2x^2\operatorname{asin}(cx)}{2}+\frac{bdex^4\operatorname{asin}(cx)}{2}+\frac{be^2x^6\operatorname{asin}(cx)}{6}+\frac{bd^2x\sqrt{-c^2x^2+1}}{4c}+\frac{bdex^3\sqrt{-c^2x^2+1}}{8c}+\frac{be^2x^5\sqrt{-}}{36} \\ a\left(\frac{d^2x^2}{2}+\frac{dex^4}{2}+\frac{e^2x^6}{6}\right)\end{cases}$$

[In] integrate(x*(e*x**2+d)**2*(a+b*asin(c*x)),x)

[Out] Piecewise((a*d**2*x**2/2 + a*d*e*x**4/2 + a*e**2*x**6/6 + b*d**2*x**2*asin(c*x)/2 + b*d*e*x**4*asin(c*x)/2 + b*e**2*x**6*asin(c*x)/6 + b*d**2*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d*e*x**3*sqrt(-c**2*x**2 + 1)/(8*c) + b*e**2*x**5*sqrt(-c**2*x**2 + 1)/(36*c) - b*d**2*asin(c*x)/(4*c**2) + 3*b*d*e*x*sqrt(-c**2*x**2 + 1)/(16*c**3) + 5*b*e**2*x**3*sqrt(-c**2*x**2 + 1)/(144*c**3) - 3*b*d*e*asin(c*x)/(16*c**4) + 5*b*e**2*x*sqrt(-c**2*x**2 + 1)/(96*c**5) - 5*b*e**2*asin(c*x)/(96*c**6), Ne(c, 0)), (a*(d**2*x**2/2 + d*e*x**4/2 + e**2*x**6/6), True))

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 223, normalized size of antiderivative = 1.22

$$\int x(d+ex^2)^2(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{6}ae^2x^6 + \frac{1}{2}adex^4 + \frac{1}{2}ad^2x^2 + \frac{1}{4}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^2$$
$$+ \frac{1}{16}\left(8x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bde$$
$$+ \frac{1}{288}\left(48x^6\arcsin(cx) + \left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2} + \frac{10\sqrt{-c^2x^2+1}x^3}{c^4} + \frac{15\sqrt{-c^2x^2+1}x}{c^6} - \frac{15\arcsin(cx)}{c^7}\right)c$$

```
[In] integrate(x*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/6*a*e^2*x^6 + 1/2*a*d*e*x^4 + 1/2*a*d^2*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*
(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2 + 1/16*(8*x^4*arcsin(c*
x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(
c*x)/c^5)*c)*b*d*e + 1/288*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/
c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcs
in(c*x)/c^7)*c)*b*e^2
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 350 vs. 2(167) = 334.

Time = 0.28 (sec) , antiderivative size = 350, normalized size of antiderivative = 1.91

$$\int x(d+ex^2)^2(a+b\arcsin(cx))\,dx = \frac{1}{6}ae^2x^6 + \frac{1}{2}adex^4 + \frac{\sqrt{-c^2x^2+1}bd^2x}{4c} + \frac{(c^2x^2-1)bd^2\arcsin(cx)}{2c^2} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bdex}{8c^3} + \frac{(c^2x^2-1)ad^2}{2c^2} + \frac{bd^2\arcsin(cx)}{4c^2} + \frac{(c^2x^2-1)^2bde\arcsin(cx)}{2c^4} + \frac{5\sqrt{-c^2x^2+1}bdex}{16c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}be^2x}{36c^5} + \frac{(c^2x^2-1)bde\arcsin(cx)}{c^4} + \frac{(c^2x^2-1)^3be^2\arcsin(cx)}{6c^6} - \frac{13(-c^2x^2+1)^{\frac{3}{2}}be^2x}{144c^5} + \frac{5bde\arcsin(cx)}{16c^4} + \frac{(c^2x^2-1)^2be^2\arcsin(cx)}{2c^6} + \frac{11\sqrt{-c^2x^2+1}be^2x}{96c^5} + \frac{(c^2x^2-1)be^2\arcsin(cx)}{2c^6} + \frac{11be^2\arcsin(cx)}{96c^6}$$

```
[In] integrate(x*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/6*a*e^2*x^6 + 1/2*a*d*e*x^4 + 1/4*sqrt(-c^2*x^2 + 1)*b*d^2*x/c + 1/2*(c^2
*x^2 - 1)*b*d^2*arcsin(c*x)/c^2 - 1/8*(-c^2*x^2 + 1)^(3/2)*b*d*e*x/c^3 + 1/
2*(c^2*x^2 - 1)*a*d^2/c^2 + 1/4*b*d^2*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)^2
*b*d*e*arcsin(c*x)/c^4 + 5/16*sqrt(-c^2*x^2 + 1)*b*d*e*x/c^3 + 1/36*(c^2*x^
2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^2*x/c^5 + (c^2*x^2 - 1)*b*d*e*arcsin(c*x)/c
^4 + 1/6*(c^2*x^2 - 1)^3*b*e^2*arcsin(c*x)/c^6 - 13/144*(-c^2*x^2 + 1)^(3/2
)*b*e^2*x/c^5 + 5/16*b*d*e*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^2*b*e^2*arcs
in(c*x)/c^6 + 11/96*sqrt(-c^2*x^2 + 1)*b*e^2*x/c^5 + 1/2*(c^2*x^2 - 1)*b*e^
2*arcsin(c*x)/c^6 + 11/96*b*e^2*arcsin(c*x)/c^6
```

Mupad [F(-1)]

Timed out.

$$\int x(d+ex^2)^2 (a+b\arcsin(cx))\,dx = \int x\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^2\,dx$$

```
[In] int(x*(a + b*asin(c*x))*(d + e*x^2)^2,x)
```

```
[Out] int(x*(a + b*asin(c*x))*(d + e*x^2)^2, x)
```

3.609 $\int (d+ex^2)^2 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 18, antiderivative size = 150

$$\int (d+ex^2)^2 (a+b\arcsin(cx))\,dx = \frac{b(15c^4d^2+10c^2de+3e^2)\sqrt{1-c^2x^2}}{15c^5} - \frac{2be(5c^2d+3e)\left(1-c^2x^2\right)^{3/2}}{45c^5} + \frac{be^2(1-c^2x^2)^{5/2}}{25c^5} + d^2x(a+b\arcsin(cx)) + \frac{2}{3}dex^3(a+b\arcsin(cx)) + \frac{1}{5}e^2x^5(a+b\arcsin(cx))$$

```
[Out] -2/45*b*e*(5*c^2*d+3*e)*(-c^2*x^2+1)^(3/2)/c^5+1/25*b*e^2*(-c^2*x^2+1)^(5/2
)/c^5+d^2*x*(a+b*arcsin(c*x))+2/3*d*e*x^3*(a+b*arcsin(c*x))+1/5*e^2*x^5*(a+
b*arcsin(c*x))+1/15*b*(15*c^4*d^2+10*c^2*d*e+3*e^2)*(-c^2*x^2+1)^(1/2)/c^5
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {200, 4755, 12, 1261, 712}

$$\int (d+ex^2)^2 (a+b\arcsin(cx))\,dx = d^2x(a+b\arcsin(cx)) + \frac{2}{3}dex^3(a+b\arcsin(cx)) + \frac{1}{5}e^2x^5(a+b\arcsin(cx)) - \frac{2be\left(1-c^2x^2\right)^{3/2}(5c^2d+3e)}{45c^5} + \frac{be^2(1-c^2x^2)^{5/2}}{25c^5} + \frac{b\sqrt{1-c^2x^2}(15c^4d^2+10c^2de+3e^2)}{15c^5}$$

```
[In] Int[(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(15*c^4*d^2 + 10*c^2*d*e + 3*e^2)*Sqrt[1 - c^2*x^2])/(15*c^5) - (2*b*e*(
5*c^2*d + 3*e)*(1 - c^2*x^2)^(3/2))/(45*c^5) + (b*e^2*(1 - c^2*x^2)^(5/2))/
(25*c^5) + d^2*x*(a + b*ArcSin[c*x]) + (2*d*e*x^3*(a + b*ArcSin[c*x]))/3 +
(e^2*x^5*(a + b*ArcSin[c*x]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 712

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1261

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 4755

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= d^2x(a+b\arcsin(cx))+\frac{2}{3}dex^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{5}e^2x^5(a+b\arcsin(cx))-(bc)\int\frac{x(15d^2+10dex^2+3e^2x^4)}{15\sqrt{1-c^2x^2}}\,dx
\end{aligned}
$$

$$
\begin{aligned}
&= d^2x(a+b\arcsin(cx))+\frac{2}{3}dex^3(a+b\arcsin(cx)) \\
&\quad +\frac{1}{5}e^2x^5(a+b\arcsin(cx))-\frac{1}{15}(bc)\int\frac{x(15d^2+10dex^2+3e^2x^4)}{\sqrt{1-c^2x^2}}\,dx \\
&= d^2x(a+b\arcsin(cx))+\frac{2}{3}dex^3(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(a+b\arcsin(cx)) \\
&\quad -\frac{1}{30}(bc)\text{Subst}\left(\int\frac{15d^2+10dex+3e^2x^2}{\sqrt{1-c^2x}}\,dx,x,x^2\right) \\
&= d^2x(a+b\arcsin(cx))+\frac{2}{3}dex^3(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(a+b\arcsin(cx)) \\
&\quad -\frac{1}{30}(bc)\text{Subst}\left(\int\left(\frac{15c^4d^2+10c^2de+3e^2}{c^4\sqrt{1-c^2x}}-\frac{2e(5c^2d+3e)\sqrt{1-c^2x}}{c^4}\right.\right. \\
&\quad \left.\left.+\frac{3e^2(1-c^2x)^{3/2}}{c^4}\right)\,dx,x,x^2\right) \\
&= \frac{b(15c^4d^2+10c^2de+3e^2)\sqrt{1-c^2x^2}}{15c^5}-\frac{2be(5c^2d+3e)\left(1-c^2x^2\right)^{3/2}}{45c^5} \\
&\quad +\frac{be^2(1-c^2x^2)^{5/2}}{25c^5}+d^2x(a+b\arcsin(cx))+\frac{2}{3}dex^3(a+b\arcsin(cx)) \\
&\quad +\frac{1}{5}e^2x^5(a+b\arcsin(cx))
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.83

$$
\begin{aligned}
&\int\left(d+ex^2\right)^2(a+b\arcsin(cx))\,dx \\
&= \frac{1}{225}\left(15ax\left(15d^2+10dex^2+3e^2x^4\right)\right. \\
&\quad +\frac{b\sqrt{1-c^2x^2}(24e^2+4c^2e(25d+3ex^2)+c^4(225d^2+50dex^2+9e^2x^4))}{c^5} \\
&\quad \left.+15bx\left(15d^2+10dex^2+3e^2x^4\right)\arcsin(cx)\right)
\end{aligned}
$$

```
[In] Integrate[(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (15*a*x*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4) + (b*Sqrt[1 - c^2*x^2]*(24*e^2 +
4*c^2*e*(25*d + 3*e*x^2) + c^4*(225*d^2 + 50*d*e*x^2 + 9*e^2*x^4)))/c^5 + 1
5*b*x*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4)*ArcSin[c*x])/225
```

Maple [A] (verified)

Time = 0.19 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.29

method	result
parts	$a\left(\frac{1}{5}e^{2}x^{5}+\frac{2}{3}de\,x^{3}+d^{2}x\right)+\frac{b\left(\frac{c\arcsin(cx)e^{2}x^{5}}{5}+\frac{2c\arcsin(cx)ed\,x^{3}}{3}+\arcsin(cx)d^{2}cx-\frac{3e^{2}\left(-\frac{c^{4}x^{4}\sqrt{-c^{2}x^{2}+1}}{5}-\frac{4c^{2}\cdots}{}\right.}{}\right.}{}$
derivativedivides	$\frac{\frac{a\left(d^{2}c^{5}x+\frac{2}{3}d\,c^{5}e\,x^{3}+\frac{1}{5}e^{2}c^{5}x^{5}\right)}{c^{4}}+\frac{b\left(\arcsin(cx)d^{2}c^{5}x+\frac{2\arcsin(cx)d\,c^{5}e\,x^{3}}{3}+\frac{\arcsin(cx)e^{2}c^{5}x^{5}}{5}-\frac{e^{2}\left(-\frac{c^{4}x^{4}\sqrt{-c^{2}x^{2}+1}}{5}-\frac{4c^{2}x^{2}\sqrt{-c^{2}\cdots}}{15}\right.}{5}\right.}{c^{4}}}{c}$
default	$\frac{\frac{a\left(d^{2}c^{5}x+\frac{2}{3}d\,c^{5}e\,x^{3}+\frac{1}{5}e^{2}c^{5}x^{5}\right)}{c^{4}}+\frac{b\left(\arcsin(cx)d^{2}c^{5}x+\frac{2\arcsin(cx)d\,c^{5}e\,x^{3}}{3}+\frac{\arcsin(cx)e^{2}c^{5}x^{5}}{5}-\frac{e^{2}\left(-\frac{c^{4}x^{4}\sqrt{-c^{2}x^{2}+1}}{5}-\frac{4c^{2}x^{2}\sqrt{-c^{2}\cdots}}{15}\right.}{5}\right.}{c^{4}}}{c}$

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/5*e^2*x^5+2/3*d*e*x^3+d^2*x)+b/c*(1/5*c*arcsin(c*x)*e^2*x^5+2/3*c*arcs
in(c*x)*e*d*x^3+arcsin(c*x)*d^2*c*x-1/15/c^4*(3*e^2*(-1/5*c^4*x^4*(-c^2*x^2
+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))-15*d^2*c
^4*(-c^2*x^2+1)^(1/2)+10*d*c^2*e*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2
*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.01

$$\int \left(d+ex^{2}\right)^{2}(a+b\arcsin(cx))\,dx$$
$$=\frac{45\,ac^{5}e^{2}x^{5}+150\,ac^{5}dex^{3}+225\,ac^{5}d^{2}x+15\left(3\,bc^{5}e^{2}x^{5}+10\,bc^{5}dex^{3}+15\,bc^{5}d^{2}x\right)\arcsin\left(cx\right)+\left(9\,bc^{4}e^{2}x^{4}+\cdots\right.}{225\,c^{5}}$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/225*(45*a*c^5*e^2*x^5 + 150*a*c^5*d*e*x^3 + 225*a*c^5*d^2*x + 15*(3*b*c^5
*e^2*x^5 + 10*b*c^5*d*e*x^3 + 15*b*c^5*d^2*x)*arcsin(c*x) + (9*b*c^4*e^2*x^
4 + 225*b*c^4*d^2 + 100*b*c^2*d*e + 24*b*e^2 + 2*(25*b*c^4*d*e + 6*b*c^2*e^
2)*x^2)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] (verification not implemented)

Time = 0.41 (sec) , antiderivative size = 240, normalized size of antiderivative = 1.60

$$\int \left(d+ex^2\right)^2 (a+b\arcsin(cx))\,dx$$
$$= \begin{cases} ad^2x + \frac{2adex^3}{3} + \frac{ae^2x^5}{5} + bd^2x\operatorname{asin}(cx) + \frac{2bdex^3\operatorname{asin}(cx)}{3} + \frac{be^2x^5\operatorname{asin}(cx)}{5} + \frac{bd^2\sqrt{-c^2x^2+1}}{c} + \frac{2bdex^2\sqrt{-c^2x^2+1}}{9c} + \frac{be^2 \\ a\left(d^2x + \frac{2dex^3}{3} + \frac{e^2x^5}{5}\right) \end{cases}$$

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x + 2*a*d*e*x**3/3 + a*e**2*x**5/5 + b*d**2*x*asin(c*x) +
 2*b*d*e*x**3*asin(c*x)/3 + b*e**2*x**5*asin(c*x)/5 + b*d**2*sqrt(-c**2*x**
2 + 1)/c + 2*b*d*e*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e**2*x**4*sqrt(-c**2
*x**2 + 1)/(25*c) + 4*b*d*e*sqrt(-c**2*x**2 + 1)/(9*c**3) + 4*b*e**2*x**2*s
qrt(-c**2*x**2 + 1)/(75*c**3) + 8*b*e**2*sqrt(-c**2*x**2 + 1)/(75*c**5), Ne
(c, 0)), (a*(d**2*x + 2*d*e*x**3/3 + e**2*x**5/5), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 182, normalized size of antiderivative = 1.21

$$\int \left(d+ex^2\right)^2 (a+b\arcsin(cx))\,dx$$
$$= \frac{1}{5}ae^2x^5 + \frac{2}{3}adex^3 + \frac{2}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bde$$
$$+ \frac{1}{75}\left(15x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be^2$$
$$+ ad^2x + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^2}{c}$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*e^2*x^5 + 2/3*a*d*e*x^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 +
 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*e + 1/75*(15*x^5*arcsin(c*x) +
 (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2
*x^2 + 1)/c^6)*c)*b*e^2 + a*d^2*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*
b*d^2/c
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 265, normalized size of antiderivative = 1.77

$$\int \left(d+ex^2\right)^2 (a+b\arcsin(cx))\,dx = \frac{1}{5}ae^2x^5 + \frac{2}{3}adex^3 + bd^2x\arcsin(cx) + ad^2x + \frac{2\,(c^2x^2-1)bdex\arcsin(cx)}{3\,c^2} + \frac{2\,bdex\arcsin(cx)}{3\,c^2} + \frac{(c^2x^2-1)^2be^2x\arcsin(cx)}{5\,c^4} + \frac{\sqrt{-c^2x^2+1}bd^2}{c} + \frac{2\,(c^2x^2-1)be^2x\arcsin(cx)}{5\,c^4} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}bde}{9\,c^3} + \frac{be^2x\arcsin(cx)}{5\,c^4} + \frac{2\sqrt{-c^2x^2+1}bde}{3\,c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}be^2}{25\,c^5} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}be^2}{15\,c^5} + \frac{\sqrt{-c^2x^2+1}be^2}{5\,c^5}$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/5*a*e^2*x^5 + 2/3*a*d*e*x^3 + b*d^2*x*arcsin(c*x) + a*d^2*x + 2/3*(c^2*x^
2 - 1)*b*d*e*x*arcsin(c*x)/c^2 + 2/3*b*d*e*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2
 - 1)^2*b*e^2*x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d^2/c + 2/5*(c^2*x^2
 - 1)*b*e^2*x*arcsin(c*x)/c^4 - 2/9*(-c^2*x^2 + 1)^(3/2)*b*d*e/c^3 + 1/5*b*
e^2*x*arcsin(c*x)/c^4 + 2/3*sqrt(-c^2*x^2 + 1)*b*d*e/c^3 + 1/25*(c^2*x^2 -
1)^2*sqrt(-c^2*x^2 + 1)*b*e^2/c^5 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*e^2/c^5 + 1
/5*sqrt(-c^2*x^2 + 1)*b*e^2/c^5
```

Mupad [F(-1)]

Timed out.

$$\int \left(d+ex^2\right)^2 (a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^2\,dx$$

```
[In] int((a + b*asin(c*x))*(d + e*x^2)^2,x)
```

```
[Out] int((a + b*asin(c*x))*(d + e*x^2)^2, x)
```

3.610 $\int \frac{(d+ex^2)^2(a+b\arcsin(cx))}{x}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 229

$$\int \frac{(d+ex^2)^2(a+b\arcsin(cx))}{x}\,dx = \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c} - \frac{bde\arcsin(cx)}{2c^2}-\frac{3be^2\arcsin(cx)}{32c^4}-\frac{1}{2}ibd^2\arcsin(cx)^2 + dex^2(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(a+b\arcsin(cx)) + bd^2\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - bd^2\arcsin(cx)\log(x)+d^2(a+b\arcsin(cx))\log(x) - \frac{1}{2}ibd^2\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)$$

```
[Out] -1/2*b*d*e*arcsin(c*x)/c^2-3/32*b*e^2*arcsin(c*x)/c^4-1/2*I*b*d^2*arcsin(c*
x)^2+d*e*x^2*(a+b*arcsin(c*x))+1/4*e^2*x^4*(a+b*arcsin(c*x))+b*d^2*arcsin(c
*x)*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-b*d^2*arcsin(c*x)*ln(x)+d^2*(a+b*arc
sin(c*x))*ln(x)-1/2*I*b*d^2*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1/2*b*d
*e*x*(-c^2*x^2+1)^(1/2)/c+3/32*b*e^2*x*(-c^2*x^2+1)^(1/2)/c^3+1/16*b*e^2*x^
3*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {272, 45, 4815, 6874, 327, 222, 2363, 4721, 3798, 2221, 2317, 2438}

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x} \, dx = d^2 \log(x)(a+b\arcsin(cx)) + dex^2(a+b\arcsin(cx)) + \frac{1}{4}e^2x^4(a+b\arcsin(cx)) - \frac{3be^2\arcsin(cx)}{32c^4} - \frac{bde\arcsin(cx)}{2c^2} - \frac{1}{2}ibd^2\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) - \frac{1}{2}ibd^2\arcsin(cx)^2 + bd^2\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - bd^2\log(x)\arcsin(cx) + \frac{bdex\sqrt{1-c^2x^2}}{2c} + \frac{be^2x^3\sqrt{1-c^2x^2}}{16c} + \frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}$$

```
[In] Int[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (b*d*e*x*Sqrt[1 - c^2*x^2])/(2*c) + (3*b*e^2*x*Sqrt[1 - c^2*x^2])/(32*c^3)
+ (b*e^2*x^3*Sqrt[1 - c^2*x^2])/(16*c) - (b*d*e*ArcSin[c*x])/(2*c^2) - (3*b
*e^2*ArcSin[c*x])/(32*c^4) - (I/2)*b*d^2*ArcSin[c*x]^2 + d*e*x^2*(a + b*Arc
Sin[c*x]) + (e^2*x^4*(a + b*ArcSin[c*x]))/4 + b*d^2*ArcSin[c*x]*Log[1 - E^(
(2*I)*ArcSin[c*x])] - b*d^2*ArcSin[c*x]*Log[x] + d^2*(a + b*ArcSin[c*x])*Lo
g[x] - (I/2)*b*d^2*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2363

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]*((a + b*Log[c*x^n])/Rt[-e, 2]), x
] - Dist[b*(n/Rt[-e, 2]), Int[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= dex^2(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(a+b\arcsin(cx)) \\
&\quad +d^2(a+b\arcsin(cx))\log(x)-(bc)\int\frac{dex^2+\frac{e^2x^4}{4}+d^2\log(x)}{\sqrt{1-c^2x^2}}\,dx \\
&= dex^2(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(a+b\arcsin(cx))+d^2(a+b\arcsin(cx))\log(x) \\
&\quad -(bc)\int\left(\frac{dex^2}{\sqrt{1-c^2x^2}}+\frac{e^2x^4}{4\sqrt{1-c^2x^2}}+\frac{d^2\log(x)}{\sqrt{1-c^2x^2}}\right)dx \\
&= dex^2(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(a+b\arcsin(cx))+d^2(a+b\arcsin(cx))\log(x) \\
&\quad -\left(bcd^2\right)\int\frac{\log(x)}{\sqrt{1-c^2x^2}}\,dx-(bcde)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{4}\left(bce^2\right)\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}+dex^2(a+b\arcsin(cx)) \\
&\quad +\frac{1}{4}e^2x^4(a+b\arcsin(cx))-bd^2\arcsin(cx)\log(x)+d^2(a+b\arcsin(cx))\log(x) \\
&\quad +\left(bd^2\right)\int\frac{\arcsin(cx)}{x}\,dx-\frac{(bde)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{2c}-\frac{\left(3be^2\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{16c} \\
&= \frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c} \\
&\quad -\frac{bde\arcsin(cx)}{2c^2}+dex^2(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(a+b\arcsin(cx)) \\
&\quad -bd^2\arcsin(cx)\log(x)+d^2(a+b\arcsin(cx))\log(x) \\
&\quad +\left(bd^2\right)\text{Subst}\left(\int x\cot(x)\,dx,x,\arcsin(cx)\right)-\frac{\left(3be^2\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{32c^3}
\end{aligned}
$$

$$=\frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\arcsin(cx)}{2c^2}-\frac{3be^2\arcsin(cx)}{32c^4}-\frac{1}{2}ibd^2\arcsin(cx)^2+dex^2(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(a+b\arcsin(cx))-bd^2\arcsin(cx)\log(x)+d^2(a+b\arcsin(cx))\log(x)-\left(2ibd^2\right)\text{Subst}\left(\int\frac{e^{2ix}x}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right)$$

$$=\frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\arcsin(cx)}{2c^2}-\frac{3be^2\arcsin(cx)}{32c^4}-\frac{1}{2}ibd^2\arcsin(cx)^2+dex^2(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(a+b\arcsin(cx))+bd^2\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right)-bd^2\arcsin(cx)\log(x)+d^2(a+b\arcsin(cx))\log(x)-\left(bd^2\right)\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)$$

$$=\frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\arcsin(cx)}{2c^2}-\frac{3be^2\arcsin(cx)}{32c^4}-\frac{1}{2}ibd^2\arcsin(cx)^2+dex^2(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(a+b\arcsin(cx))+bd^2\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right)-bd^2\arcsin(cx)\log(x)+d^2(a+b\arcsin(cx))\log(x)+\frac{1}{2}\left(ibd^2\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)$$

$$=\frac{bdex\sqrt{1-c^2x^2}}{2c}+\frac{3be^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{be^2x^3\sqrt{1-c^2x^2}}{16c}-\frac{bde\arcsin(cx)}{2c^2}-\frac{3be^2\arcsin(cx)}{32c^4}-\frac{1}{2}ibd^2\arcsin(cx)^2+dex^2(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(a+b\arcsin(cx))+bd^2\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right)-bd^2\arcsin(cx)\log(x)+d^2(a+b\arcsin(cx))\log(x)-\frac{1}{2}ibd^2\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 218, normalized size of antiderivative = 0.95

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x} \, dx = \frac{1}{4}\left(4adex^2+ae^2x^4+4bdex^2\arcsin(cx)+be^2x^4\arcsin(cx) + \frac{be^2\left(cx\sqrt{1-c^2x^2}(3+2c^2x^2)-6\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{8c^4} + \frac{2bde\left(cx\sqrt{1-c^2x^2}-2\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{c^2} + 4bd^2\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) + 4ad^2\log(x) - 2ibd^2\left(\arcsin(cx)^2+\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\right)\right)$$

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (4*a*d*e*x^2 + a*e^2*x^4 + 4*b*d*e*x^2*ArcSin[c*x] + b*e^2*x^4*ArcSin[c*x]
+ (b*e^2*(c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2) - 6*ArcTan[(c*x)/(-1 + Sqrt
[1 - c^2*x^2])]))/(8*c^4) + (2*b*d*e*(c*x*Sqrt[1 - c^2*x^2] - 2*ArcTan[(c*x
)/(-1 + Sqrt[1 - c^2*x^2])]))/c^2 + 4*b*d^2*ArcSin[c*x]*Log[1 - E^((2*I)*Ar
cSin[c*x])] + 4*a*d^2*Log[x] - (2*I)*b*d^2*(ArcSin[c*x]^2 + PolyLog[2, E^((
2*I)*ArcSin[c*x])]))/4
```

Maple [A] (verified)

Time = 0.42 (sec) , antiderivative size = 240, normalized size of antiderivative = 1.05

method	result
parts	$a\left(\frac{e^2x^4}{4}+de\,x^2+d^2\ln(x)\right)+b\left(-\frac{id^2\arcsin(cx)^2}{2}+d^2\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right.\right.$
derivativedivides	$ade\,x^2+\frac{a\,e^2x^4}{4}+a\,d^2\ln(cx)+\frac{b\left(-\frac{ic^4d^2\arcsin(cx)^2}{2}+c^4d^2\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+c^4d^2\arcsin(cx\right.}{}$
default	$ade\,x^2+\frac{a\,e^2x^4}{4}+a\,d^2\ln(cx)+\frac{b\left(-\frac{ic^4d^2\arcsin(cx)^2}{2}+c^4d^2\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+c^4d^2\arcsin(cx\right.}{}$

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/4*e^2*x^4+d*e*x^2+d^2*ln(x))+b*(-1/2*I*d^2*arcsin(c*x)^2+d^2*arcsin(c*
x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+d^2*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(
1/2))-I*d^2*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*d^2*polylog(2,I*c*x+(-c^
```

```
2*x^2+1)^(1/2))+1/32*arcsin(c*x)*e^2/c^4*cos(4*arcsin(c*x))-1/128*e^2/c^4*s
in(4*arcsin(c*x))-1/8*e*arcsin(c*x)*(4*c^2*d+e)/c^4*cos(2*arcsin(c*x))+1/4*
e/c^2*sin(2*arcsin(c*x))*d+1/16*e^2/c^4*sin(2*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x} dx = \int \frac{(ex^2+d)^2(b\arcsin(cx)+a)}{x} dx$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arcsin(c*x))/x, x)
```

Sympy [F]

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x} dx = \int \frac{(a+b\operatorname{asin}(cx))(d+ex^2)^2}{x} dx$$

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))/x,x)
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)**2/x, x)
```

Maxima [F]

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x} dx = \int \frac{(ex^2+d)^2(b\arcsin(cx)+a)}{x} dx$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
[Out] 1/4*a*e^2*x^4 + a*d*e*x^2 + a*d^2*log(x) + integrate((b*e^2*x^4 + 2*b*d*e*x
^2 + b*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Giac [F]

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x}\,dx = \int \frac{(ex^2+d)^2(b\arcsin{(cx)}+a)}{x}\,dx$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x,x, algorithm="giac")
[Out] integrate((e*x^2 + d)^2*(b*arcsin(c*x) + a)/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^2}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^2)/x,x)
[Out] int(((a + b*asin(c*x))*(d + e*x^2)^2)/x, x)
```

3.611 $\int \frac{(d+ex^2)^2(a+b\arcsin(cx))}{x^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 126

$$\int \frac{(d+ex^2)^2(a+b\arcsin(cx))}{x^2}\,dx = \frac{be(6c^2d+e)\sqrt{1-c^2x^2}}{3c^3} - \frac{be^2(1-c^2x^2)^{3/2}}{9c^3} - \frac{d^2(a+b\arcsin(cx))}{x} + 2dex(a+b\arcsin(cx)) + \frac{1}{3}e^2x^3(a+b\arcsin(cx)) - bcd^2\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -1/9*b*e^2*(-c^2*x^2+1)^(3/2)/c^3-d^2*(a+b*arcsin(c*x))/x+2*d*e*x*(a+b*arcs
in(c*x))+1/3*e^2*x^3*(a+b*arcsin(c*x))-b*c*d^2*arctanh((-c^2*x^2+1)^(1/2))+
1/3*b*e*(6*c^2*d+e)*(-c^2*x^2+1)^(1/2)/c^3
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {276, 4815, 1265, 911, 1167, 214}

$$\int \frac{(d+ex^2)^2(a+b\arcsin(cx))}{x^2}\,dx = -\frac{d^2(a+b\arcsin(cx))}{x} + 2dex(a+b\arcsin(cx)) + \frac{1}{3}e^2x^3(a+b\arcsin(cx)) - bcd^2\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right) + \frac{be\sqrt{1-c^2x^2}(6c^2d+e)}{3c^3} - \frac{be^2(1-c^2x^2)^{3/2}}{9c^3}$$

```
[In] Int[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (b*e*(6*c^2*d + e)*Sqrt[1 - c^2*x^2])/(3*c^3) - (b*e^2*(1 - c^2*x^2)^(3/2))
/(9*c^3) - (d^2*(a + b*ArcSin[c*x]))/x + 2*d*e*x*(a + b*ArcSin[c*x]) + (e^2
*x^3*(a + b*ArcSin[c*x]))/3 - b*c*d^2*ArcTanh[Sqrt[1 - c^2*x^2]]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^2(a+b\arcsin(cx))}{x}+2dex(a+b\arcsin(cx)) \\
&\quad +\frac{1}{3}e^2x^3(a+b\arcsin(cx))-(bc)\int\frac{-d^2+2dex^2+\frac{e^2x^4}{3}}{x\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d^2(a+b\arcsin(cx))}{x}+2dex(a+b\arcsin(cx))+\frac{1}{3}e^2x^3(a+b\arcsin(cx)) \\
&\quad -\frac{1}{2}(bc)\text{Subst}\left(\int\frac{-d^2+2dex+\frac{e^2x^2}{3}}{x\sqrt{1-c^2x}}\,dx,x,x^2\right) \\
&= -\frac{d^2(a+b\arcsin(cx))}{x}+2dex(a+b\arcsin(cx))+\frac{1}{3}e^2x^3(a+b\arcsin(cx)) \\
&\quad +\frac{b\text{Subst}\left(\int\frac{\frac{-c^4d^2+2c^2de+\frac{e^2}{3}}{c^4}-\frac{\left(2c^2de+\frac{2e^2}{3}\right)x^2}{c^4}+\frac{e^2x^4}{3c^4}}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{c} \\
&= -\frac{d^2(a+b\arcsin(cx))}{x}+2dex(a+b\arcsin(cx))+\frac{1}{3}e^2x^3(a+b\arcsin(cx)) \\
&\quad +\frac{b\text{Subst}\left(\int\left(\frac{1}{3}e\left(6d+\frac{e}{c^2}\right)-\frac{e^2x^2}{3c^2}-\frac{d^2}{\frac{1}{c^2}-\frac{x^2}{c^2}}\right)dx,x,\sqrt{1-c^2x^2}\right)}{c} \\
&= \frac{be(6c^2d+e)\sqrt{1-c^2x^2}}{3c^3}-\frac{be^2(1-c^2x^2)^{3/2}}{9c^3}-\frac{d^2(a+b\arcsin(cx))}{x} \\
&\quad +2dex(a+b\arcsin(cx))+\frac{1}{3}e^2x^3(a+b\arcsin(cx)) \\
&\quad -\frac{(bd^2)\,\text{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{c} \\
&= \frac{be(6c^2d+e)\sqrt{1-c^2x^2}}{3c^3}-\frac{be^2(1-c^2x^2)^{3/2}}{9c^3}-\frac{d^2(a+b\arcsin(cx))}{x} \\
&\quad +2dex(a+b\arcsin(cx))+\frac{1}{3}e^2x^3(a+b\arcsin(cx))-bcd^2\text{arctanh}\left(\sqrt{1-c^2x^2}\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.02

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x^2}\,dx = \frac{1}{9}\left(-\frac{9ad^2}{x}+18adex+3ae^2x^3+\frac{be\sqrt{1-c^2x^2}(2e+c^2(18d+ex^2))}{c^3}+\frac{3b(-3d^2+6dex^2+e^2x^4)\arcsin(cx)}{x}+9bcd^2\log(x)-9bcd^2\log\left(1+\sqrt{1-c^2x^2}\right)\right)$$

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] ((-9*a*d^2)/x + 18*a*d*e*x + 3*a*e^2*x^3 + (b*e*Sqrt[1 - c^2*x^2]*(2*e + c^
2*(18*d + e*x^2)))/c^3 + (3*b*(-3*d^2 + 6*d*e*x^2 + e^2*x^4)*ArcSin[c*x])/x
 + 9*b*c*d^2*Log[x] - 9*b*c*d^2*Log[1 + Sqrt[1 - c^2*x^2]])/9
```

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 157, normalized size of antiderivative = 1.25

method	result
parts	$a\left(\frac{e^2x^3}{3}+2dex-\frac{d^2}{x}\right)+bc\left(\frac{\arcsin(cx)e^2x^3}{3c}+\frac{2\arcsin(cx)edx}{c}-\frac{\arcsin(cx)d^2}{cx}-\frac{e^2\left(-\frac{c^2x^2\sqrt{-c^2x^2+1}}{3}-2\sqrt{\cdots}\right.}{\cdots}\right.$
derivativedivides	$c\left(\frac{a\left(2c^3dex+\frac{e^2c^3x^3}{3}-\frac{c^3d^2}{x}\right)}{c^4}+\frac{b\left(2\arcsin(cx)c^3dex+\frac{\arcsin(cx)e^2c^3x^3}{3}-\frac{\arcsin(cx)c^3d^2}{x}-\frac{e^2\left(-\frac{c^2x^2\sqrt{-c^2x^2+1}}{3}-\frac{2\sqrt{-c^2\cdots}}{3}\right.}{3}\right.}{c^4}\right.$
default	$c\left(\frac{a\left(2c^3dex+\frac{e^2c^3x^3}{3}-\frac{c^3d^2}{x}\right)}{c^4}+\frac{b\left(2\arcsin(cx)c^3dex+\frac{\arcsin(cx)e^2c^3x^3}{3}-\frac{\arcsin(cx)c^3d^2}{x}-\frac{e^2\left(-\frac{c^2x^2\sqrt{-c^2x^2+1}}{3}-\frac{2\sqrt{-c^2\cdots}}{3}\right.}{3}\right.}{c^4}\right.$

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/3*e^2*x^3+2*d*e*x-d^2/x)+b*c*(1/3/c*arcsin(c*x)*e^2*x^3+2/c*arcsin(c*x
)*e*d*x-arcsin(c*x)*d^2/c/x-1/3/c^4*(e^2*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2
/3*(-c^2*x^2+1)^(1/2))+3*c^4*d^2*arctanh(1/(-c^2*x^2+1)^(1/2))-6*c^2*d*e*(-
c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.30 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.37

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x^2}\,dx = \frac{6\,ac^3e^2x^4 - 9\,bc^4d^2x\log\left(\sqrt{-c^2x^2+1}+1\right) + 9\,bc^4d^2x\log\left(\sqrt{-c^2x^2+1}-1\right) + 36\,ac^3dex^2 - 18\,ac^3d^2 + 6}{18\,c^3x}$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] 1/18*(6*a*c^3*e^2*x^4 - 9*b*c^4*d^2*x*log(sqrt(-c^2*x^2 + 1) + 1) + 9*b*c^4
*d^2*x*log(sqrt(-c^2*x^2 + 1) - 1) + 36*a*c^3*d*e*x^2 - 18*a*c^3*d^2 + 6*(b
*c^3*e^2*x^4 + 6*b*c^3*d*e*x^2 - 3*b*c^3*d^2)*arcsin(c*x) + 2*(b*c^2*e^2*x^
3 + 2*(9*b*c^2*d*e + b*e^2)*x)*sqrt(-c^2*x^2 + 1))/(c^3*x)
```

Sympy [A] (verification not implemented)

Time = 2.47 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.33

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x^2}\,dx = -\frac{ad^2}{x} + 2adex + \frac{ae^2x^3}{3} + bcd^2\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|} > 1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) - \frac{bce^2\left(\begin{cases} -\frac{x^2\sqrt{-c^2x^2+1}}{3c^2} - \frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for } c^2 \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}\right)}{3} - \frac{bd^2\operatorname{asin}(cx)}{x} + 2bde\left(\begin{cases} 0 & \text{for } c = 0 \\ x\operatorname{asin}(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise} \end{cases}\right) + \frac{be^2x^3\operatorname{asin}(cx)}{3}$$

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*d**2/x + 2*a*d*e*x + a*e**2*x**3/3 + b*c*d**2*Piecewise((-acosh(1/(c*x))
, 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b*c*e**2*Piecewise((-x*
*2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 + 1)/(3*c**4), Ne(c**2
, 0)), (x**4/4, True))/3 - b*d**2*asin(c*x)/x + 2*b*d*e*Piecewise((0, Eq(c,
 0)), (x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, True)) + b*e**2*x**3*asin(c*x)
/3
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.20

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x^2} dx$$
$$= \frac{1}{3} ae^2x^3 - \left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\arcsin(cx)}{x}\right)bd^2$$
$$+ \frac{1}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be^2$$
$$+ 2adex + \frac{2\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bde}{c} - \frac{ad^2}{x}$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a*e^2*x^3 - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x
)/x)*b*d^2 + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqr
t(-c^2*x^2 + 1)/c^4))*b*e^2 + 2*a*d*e*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^
2 + 1))*b*d*e/c - a*d^2/x
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 4243 vs. 2(114) = 228.

Time = 2.10 (sec) , antiderivative size = 4243, normalized size of antiderivative = 33.67

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x^2} dx = \text{Too large to display}$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^12*d^2*x^8*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c
^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) - 1/2*a*c^12*d^
2*x^8/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1)
 + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1)
+ 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) + b*c^11*d^2*x^7*log(abs(c)*abs(x))/((c^1
0*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3
*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt
(-c^2*x^2 + 1) + 1)^7) - b*c^11*d^2*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^10*
x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c
^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-
c^2*x^2 + 1) + 1)^7) - 2*b*c^10*d^2*x^6*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x
```

^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^
2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1
)^6) - 2*a*c^10*d^2*x^6/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(
sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(s
qrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 3*b*c^9*d^2*x^5*log(a
bs(c)*abs(x))/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*
x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x
^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 3*b*c^9*d^2*x^5*log(sqrt(-c^2*x
^2 + 1) + 1)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x
^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^
2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 2*b*c^9*d*e*x^7/((c^10*x^7/(sqrt
(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
 1) + 1)^7) + 4*b*c^8*d*e*x^6*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) +
1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1)
 + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) - 3*b
*c^8*d^2*x^4*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/
(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(
sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 4*a*c^8*d*e*x^6/((c^
10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqr
t(-c^2*x^2 + 1) + 1)^6) - 3*a*c^8*d^2*x^4/((c^10*x^7/(sqrt(-c^2*x^2 + 1) +
1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1)
 + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 3*b
*c^7*d^2*x^3*log(abs(c)*abs(x))/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c
^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 3*b*c^7*d^2*x
^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^
8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c
^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 2/9*b*c^7*e^2*
x^7/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) +
 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) +
1))*(sqrt(-c^2*x^2 + 1) + 1)^7) - 2*b*c^7*d*e*x^5/((c^10*x^7/(sqrt(-c^2*x^2
 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*
x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^
5) + 8*b*c^6*d*e*x^4*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*
c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
 c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) - 2*b*c^6*d^2*
x^2*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^
2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2
x^2 + 1) + 1))(sqrt(-c^2*x^2 + 1) + 1)^2) + 8*a*c^6*d*e*x^4/((c^10*x^7/(s
qrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^
2 + 1) + 1)^4) - 2*a*c^6*d^2*x^2/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*
c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +

```
c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + b*c^5*d^2*x*
log(abs(c)*abs(x))/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(
-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-
c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - b*c^5*d^2*x*log(sqrt(-c^2*x^
2 + 1) + 1)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^
2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2
 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - 2/3*b*c^5*e^2*x^5/((c^10*x^7/(sqrt(
-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
1) + 1)^5) + 2*b*c^5*d*e*x^3/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*
x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4
*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 1/2*b*c^4*d^2*ar
csin(c*x)/(c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 +
 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 +
1) + 1)) + 8/3*b*c^4*e^2*x^4*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1
)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1)
+ 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 4*b*
c^4*d*e*x^2*arcsin(c*x)/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(
sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(s
qrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 1/2*a*c^4*d^2/(c^10*x
^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^
6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1)) + 8/3*a*
c^4*e^2*x^4/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^
2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2
 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 4*a*c^4*d*e*x^2/((c^10*x^7/(sqrt(
-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
1) + 1)^2) + 2/3*b*c^3*e^2*x^3/((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^
8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c
^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) + 2*b*c^3*d*e*x/
((c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^
5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*
(sqrt(-c^2*x^2 + 1) + 1)) + 2/9*b*c*e^2*x/((c^10*x^7/(sqrt(-c^2*x^2 + 1) +
1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 3*c^6*x^3/(sqrt(-c^2*x^2 + 1)
 + 1)^3 + c^4*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x^2}\,dx$$
$$= \begin{cases} \frac{a\,(-3\,d^2+6\,d\,e\,x^2+e^2\,x^4)}{3\,x} + b\,e^2\left(\frac{\sqrt{\frac{1}{c^2}-x^2}\,\left(\frac{2}{c^2}+x^2\right)}{9} + \frac{x^3\,\mathrm{asin}(c\,x)}{3}\right) - b\,c\,d^2\,\mathrm{atanh}\left(\frac{1}{\sqrt{1-c^2\,x^2}}\right) - \frac{b\,d^2\,\mathrm{asin}(c\,x)}{x} + \frac{2\,b\,d\,e\,(\cdots}{} \\ \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(e\,x^2+d)^2}{x^2}\,dx \end{cases}$$

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^2)/x^2,x)
```

```
[Out] piecewise(0 < c, (a*(- 3*d^2 + e^2*x^4 + 6*d*e*x^2))/(3*x) + b*e^2*(((1/c^2
 - x^2)^(1/2)*(2/c^2 + x^2))/9 + (x^3*asin(c*x))/3) - b*c*d^2*atanh(1/(- c^
2*x^2 + 1)^(1/2)) - (b*d^2*asin(c*x))/x + (2*b*d*e*((- c^2*x^2 + 1)^(1/2) +
 c*x*asin(c*x)))/c, ~0 < c, int(((a + b*asin(c*x))*(d + e*x^2)^2)/x^2, x))
```

3.612 $\int \frac{(d+ex^2)^2(a+b\arcsin(cx))}{x^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 185

$$\int \frac{(d+ex^2)^2(a+b\arcsin(cx))}{x^3}\,dx = -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c} - \frac{be^2\arcsin(cx)}{4c^2}-ibde\arcsin(cx)^2 - \frac{d^2(a+b\arcsin(cx))}{2x^2}+\frac{1}{2}e^2x^2(a+b\arcsin(cx)) + 2bde\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - 2bde\arcsin(cx)\log(x)+2de(a+b\arcsin(cx))\log(x) - ibde\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)$$

```
[Out] -1/4*b*e^2*arcsin(c*x)/c^2-I*b*d*e*arcsin(c*x)^2-1/2*d^2*(a+b*arcsin(c*x))/
x^2+1/2*e^2*x^2*(a+b*arcsin(c*x))+2*b*d*e*arcsin(c*x)*ln(1-(I*c*x+(-c^2*x^2
+1)^(1/2))^2)-2*b*d*e*arcsin(c*x)*ln(x)+2*d*e*(a+b*arcsin(c*x))*ln(x)-I*b*d
*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b*c*d^2*(-c^2*x^2+1)^(1/2)/x
+1/4*b*e^2*x*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules

used = {272, 45, 4815, 12, 6874, 270, 327, 222, 2363, 4721, 3798, 2221, 2317, 2438}

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x^3} dx = -\frac{d^2(a+b\arcsin(cx))}{2x^2} + 2de\log(x)(a+b\arcsin(cx)) + \frac{1}{2}e^2x^2(a+b\arcsin(cx)) - \frac{be^2\arcsin(cx)}{4c^2} - ibde\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right) - ibde\arcsin(cx)^2 + 2bde\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - 2bde\log(x)\arcsin(cx) - \frac{bcd^2\sqrt{1-c^2x^2}}{2x} + \frac{be^2x\sqrt{1-c^2x^2}}{4c}$$

```
[In] Int[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(b*c*d^2*Sqrt[1 - c^2*x^2])/x + (b*e^2*x*Sqrt[1 - c^2*x^2])/(4*c) - (b
*e^2*ArcSin[c*x])/(4*c^2) - I*b*d*e*ArcSin[c*x]^2 - (d^2*(a + b*ArcSin[c*x]
))/(2*x^2) + (e^2*x^2*(a + b*ArcSin[c*x]))/2 + 2*b*d*e*ArcSin[c*x]*Log[1 -
E^((2*I)*ArcSin[c*x])] - 2*b*d*e*ArcSin[c*x]*Log[x] + 2*d*e*(a + b*ArcSin[c
*x])*Log[x] - I*b*d*e*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2363

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]*((a + b*Log[c*x^n])/Rt[-e, 2]), x
] - Dist[b*(n/Rt[-e, 2]), Int[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^2(a+b\arcsin(cx))}{2x^2}+\frac{1}{2}e^2x^2(a+b\arcsin(cx)) \\
&\quad +2de(a+b\arcsin(cx))\log(x)-(bc)\int\frac{-\frac{d^2}{x^2}+e^2x^2+4de\log(x)}{2\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d^2(a+b\arcsin(cx))}{2x^2}+\frac{1}{2}e^2x^2(a+b\arcsin(cx)) \\
&\quad +2de(a+b\arcsin(cx))\log(x)-\frac{1}{2}(bc)\int\frac{-\frac{d^2}{x^2}+e^2x^2+4de\log(x)}{\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d^2(a+b\arcsin(cx))}{2x^2}+\frac{1}{2}e^2x^2(a+b\arcsin(cx))+2de(a+b\arcsin(cx))\log(x) \\
&\quad -\frac{1}{2}(bc)\int\left(-\frac{d^2}{x^2\sqrt{1-c^2x^2}}+\frac{e^2x^2}{\sqrt{1-c^2x^2}}+\frac{4de\log(x)}{\sqrt{1-c^2x^2}}\right)dx \\
&= -\frac{d^2(a+b\arcsin(cx))}{2x^2}+\frac{1}{2}e^2x^2(a+b\arcsin(cx))+2de(a+b\arcsin(cx))\log(x) \\
&\quad +\frac{1}{2}\left(bcd^2\right)\int\frac{1}{x^2\sqrt{1-c^2x^2}}\,dx-(2bcde)\int\frac{\log(x)}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{2}\left(bce^2\right)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{d^2(a+b\arcsin(cx))}{2x^2} \\
&\quad +\frac{1}{2}e^2x^2(a+b\arcsin(cx))-2bde\arcsin(cx)\log(x) \\
&\quad +2de(a+b\arcsin(cx))\log(x)+(2bde)\int\frac{\arcsin(cx)}{x}\,dx-\frac{\left(be^2\right)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{4c} \\
&= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x}+\frac{be^2x\sqrt{1-c^2x^2}}{4c}-\frac{be^2\arcsin(cx)}{4c^2} \\
&\quad -\frac{d^2(a+b\arcsin(cx))}{2x^2}+\frac{1}{2}e^2x^2(a+b\arcsin(cx))-2bde\arcsin(cx)\log(x) \\
&\quad +2de(a+b\arcsin(cx))\log(x)+(2bde)\text{Subst}\left(\int x\cot(x)\,dx,x,\arcsin(cx)\right)
\end{aligned}$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x} + \frac{be^2x\sqrt{1-c^2x^2}}{4c} - \frac{be^2\arcsin(cx)}{4c^2} - ibde\arcsin(cx)^2 - \frac{d^2(a+b\arcsin(cx))}{2x^2} + \frac{1}{2}e^2x^2(a+b\arcsin(cx)) - 2bde\arcsin(cx)\log(x) + 2de(a+b\arcsin(cx))\log(x) - (4ibde)\text{Subst}\left(\int \frac{e^{2ix}x}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x} + \frac{be^2x\sqrt{1-c^2x^2}}{4c} - \frac{be^2\arcsin(cx)}{4c^2} - ibde\arcsin(cx)^2 - \frac{d^2(a+b\arcsin(cx))}{2x^2} + \frac{1}{2}e^2x^2(a+b\arcsin(cx)) + 2bde\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - 2bde\arcsin(cx)\log(x) + 2de(a+b\arcsin(cx))\log(x) - (2bde)\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x} + \frac{be^2x\sqrt{1-c^2x^2}}{4c} - \frac{be^2\arcsin(cx)}{4c^2} - ibde\arcsin(cx)^2 - \frac{d^2(a+b\arcsin(cx))}{2x^2} + \frac{1}{2}e^2x^2(a+b\arcsin(cx)) + 2bde\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - 2bde\arcsin(cx)\log(x) + 2de(a+b\arcsin(cx))\log(x) + (ibde)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)$$

$$= -\frac{bcd^2\sqrt{1-c^2x^2}}{2x} + \frac{be^2x\sqrt{1-c^2x^2}}{4c} - \frac{be^2\arcsin(cx)}{4c^2} - ibde\arcsin(cx)^2 - \frac{d^2(a+b\arcsin(cx))}{2x^2} + \frac{1}{2}e^2x^2(a+b\arcsin(cx)) + 2bde\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - 2bde\arcsin(cx)\log(x) + 2de(a+b\arcsin(cx))\log(x) - ibde\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 184, normalized size of antiderivative = 0.99

$$\int \frac{(d+ex^2)^2(a+b\arcsin(cx))}{x^3}\,dx = \frac{1}{2}\left(-\frac{ad^2}{x^2} + ae^2x^2 - \frac{bcd^2\sqrt{1-c^2x^2}}{x} + \frac{be^2x\sqrt{1-c^2x^2}}{2c} - 2ibde\arcsin(cx)^2 + \frac{be^2\arctan\left(\frac{cx}{1-\sqrt{1-c^2x^2}}\right)}{c^2} + b\arcsin(cx)\left(-\frac{d^2}{x^2} + e^2x^2 + 4de\log\left(1-e^{2i\arcsin(cx)}\right)\right) + 4ade\log(x) - 2ibde\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)\right)$$

[In] Integrate[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^3,x]

[Out] (-((a*d^2)/x^2) + a*e^2*x^2 - (b*c*d^2*Sqrt[1 - c^2*x^2])/x + (b*e^2*x*Sqrt[1 - c^2*x^2])/(2*c) - (2*I)*b*d*e*ArcSin[c*x]^2 + (b*e^2*ArcTan[(c*x)/(1 - Sqrt[1 - c^2*x^2])])/c^2 + b*ArcSin[c*x]*(-(d^2/x^2) + e^2*x^2 + 4*d*e*Log[1 - E^((2*I)*ArcSin[c*x])]) + 4*a*d*e*Log[x] - (2*I)*b*d*e*PolyLog[2, E^((2*I)*ArcSin[c*x])])/2

Maple [A] (verified)

Time = 0.62 (sec) , antiderivative size = 246, normalized size of antiderivative = 1.33

method	result
parts	$a\left(\frac{e^2x^2}{2}-\frac{d^2}{2x^2}+2de\ln(x)\right)-ibde\arcsin(cx)^2+\frac{b\,e^2x\sqrt{-c^2x^2+1}}{4c}+\frac{b\,e^2\arcsin(cx)x^2}{2}-\frac{b\,e^2\arcsin}{4c^2}$
derivativedivides	$c^2\left(\frac{a\,x^2e^2}{2c^2}-\frac{a\,d^2}{2c^2x^2}+\frac{2ade\ln(cx)}{c^2}-\frac{ibde\arcsin(cx)^2}{c^2}+\frac{b\,e^2x\sqrt{-c^2x^2+1}}{4c^3}+\frac{b\arcsin(cx)x^2e^2}{2c^2}-\frac{b\,e^2\arcsin(cx}{4c^4}\right.$
default	$c^2\left(\frac{a\,x^2e^2}{2c^2}-\frac{a\,d^2}{2c^2x^2}+\frac{2ade\ln(cx)}{c^2}-\frac{ibde\arcsin(cx)^2}{c^2}+\frac{b\,e^2x\sqrt{-c^2x^2+1}}{4c^3}+\frac{b\arcsin(cx)x^2e^2}{2c^2}-\frac{b\,e^2\arcsin(cx}{4c^4}\right.$

[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)

[Out] a*(1/2*e^2*x^2-1/2*d^2/x^2+2*d*e*ln(x))-I*b*d*e*arcsin(c*x)^2+1/4*b*e^2*x*(-c^2*x^2+1)^(1/2)/c+1/2*b*e^2*arcsin(c*x)*x^2-1/4*b*e^2*arcsin(c*x)/c^2+1/2*I*b*c^2*d^2-1/2*b*c*d^2*(-c^2*x^2+1)^(1/2)/x-1/2*b*d^2/x^2*arcsin(c*x)+2*b*e*d*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-2*I*b*e*d*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))+2*b*e*d*arcsin(c*x)*ln(1-I*c*x-(-c^2*x^2+1)^(1/2))-2*I*b*e*d*polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))

Fricas [F]

$$\int \frac{(d+ex^2)^2\,(a+b\arcsin(cx))}{x^3}\,dx=\int \frac{(ex^2+d)^2(b\arcsin(cx)+a)}{x^3}\,dx$$

[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")

[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^2)*arcsin(c*x))/x^3, x)

Sympy [F]

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x^3} dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(d+ex^2)^2}{x^3} dx$$

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))/x**3,x)
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)**2/x**3, x)
```

Maxima [F]

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x^3} dx = \int \frac{(ex^2+d)^2(b\arcsin{(cx)}+a)}{x^3} dx$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
[Out] 1/2*a*e^2*x^2 - 1/2*b*d^2*(sqrt(-c^2*x^2 + 1)*c/x + arcsin(c*x)/x^2) + 2*a*
d*e*log(x) - 1/2*a*d^2/x^2 + integrate((b*e^2*x^2 + 2*b*d*e)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Giac [F]

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x^3} dx = \int \frac{(ex^2+d)^2(b\arcsin{(cx)}+a)}{x^3} dx$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
[Out] integrate((e*x^2 + d)^2*(b*arcsin(c*x) + a)/x^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x^3} dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^2}{x^3} dx$$

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^2)/x^3,x)
[Out] int(((a + b*asin(c*x))*(d + e*x^2)^2)/x^3, x)
```

3.613 $\int \frac{(d+ex^2)^2(a+b\arcsin(cx))}{x^4} dx$

Optimal result

Integrand size = 21, antiderivative size = 126

$$\int \frac{(d+ex^2)^2(a+b\arcsin(cx))}{x^4} dx = \frac{be^2\sqrt{1-c^2x^2}}{c} - \frac{bcd^2\sqrt{1-c^2x^2}}{6x^2} - \frac{d^2(a+b\arcsin(cx))}{3x^3} - \frac{2de(a+b\arcsin(cx))}{x} + e^2x(a+b\arcsin(cx)) - \frac{1}{6}bcd(c^2d+12e)\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -1/3*d^2*(a+b*arcsin(c*x))/x^3-2*d*e*(a+b*arcsin(c*x))/x+e^2*x*(a+b*arcsin(
c*x))-1/6*b*c*d*(c^2*d+12*e)*arctanh((-c^2*x^2+1)^(1/2))+b*e^2*(-c^2*x^2+1)
^(1/2)/c-1/6*b*c*d^2*(-c^2*x^2+1)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {276, 4815, 1265, 911, 1171, 396, 214}

$$\int \frac{(d+ex^2)^2(a+b\arcsin(cx))}{x^4} dx = -\frac{d^2(a+b\arcsin(cx))}{3x^3} - \frac{2de(a+b\arcsin(cx))}{x} + e^2x(a+b\arcsin(cx)) - \frac{1}{6}bcd\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)(c^2d+12e) - \frac{bcd^2\sqrt{1-c^2x^2}}{6x^2} + \frac{be^2\sqrt{1-c^2x^2}}{c}$$

```
[In] Int[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (b*e^2*Sqrt[1 - c^2*x^2])/c - (b*c*d^2*Sqrt[1 - c^2*x^2])/(6*x^2) - (d^2*(a
 + b*ArcSin[c*x]))/(3*x^3) - (2*d*e*(a + b*ArcSin[c*x]))/x + e^2*x*(a + b*A
rcSin[c*x]) - (b*c*d*(c^2*d + 12*e)*ArcTanh[Sqrt[1 - c^2*x^2]])/6
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1171

```
Int[((d_) + (e_.)*(x_)^2)^(q_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 + c*x^4)^p, d + e*x^2
, x], R = Coeff[PolynomialRemainder[(a + b*x^2 + c*x^4)^p, d + e*x^2, x], x
, 0]}, Simp[(-R)*x*((d + e*x^2)^(q + 1)/(2*d*(q + 1))), x] + Dist[1/(2*d*(q
 + 1)), Int[(d + e*x^2)^(q + 1)*ExpandToSum[2*d*(q + 1)*Qx + R*(2*q + 3), x
], x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2
 - b*d*e + a*e^2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 1265

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
```

```
gerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^2(a+b\arcsin(cx))}{3x^3} - \frac{2de(a+b\arcsin(cx))}{x} \\
&\quad + e^2x(a+b\arcsin(cx)) - (bc)\int \frac{-\frac{d^2}{3} - 2dex^2 + e^2x^4}{x^3\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d^2(a+b\arcsin(cx))}{3x^3} - \frac{2de(a+b\arcsin(cx))}{x} + e^2x(a+b\arcsin(cx)) \\
&\quad - \frac{1}{2}(bc)\text{Subst}\left(\int \frac{-\frac{d^2}{3} - 2dex + e^2x^2}{x^2\sqrt{1-c^2x}}\,dx, x, x^2\right) \\
&= -\frac{d^2(a+b\arcsin(cx))}{3x^3} - \frac{2de(a+b\arcsin(cx))}{x} + e^2x(a+b\arcsin(cx)) \\
&\quad + \frac{b\text{Subst}\left(\int \frac{\frac{-\frac{1}{3}c^4d^2-2c^2de+e^2}{c^4} - \frac{(-2c^2de+2e^2)x^2}{c^4} + \frac{e^2x^4}{c^4}}{\left(\frac{1}{c^2}-\frac{x^2}{c^2}\right)^2}\,dx, x, \sqrt{1-c^2x^2}\right)}{c} \\
&= -\frac{bcd^2\sqrt{1-c^2x^2}}{6x^2} - \frac{d^2(a+b\arcsin(cx))}{3x^3} \\
&\quad - \frac{2de(a+b\arcsin(cx))}{x} + e^2x(a+b\arcsin(cx)) \\
&\quad - \frac{1}{2}(bc)\text{Subst}\left(\int \frac{\frac{1}{3}\left(d^2 + \frac{12de}{c^2} - \frac{6e^2}{c^4}\right) + \frac{2e^2x^2}{c^4}}{\frac{1}{c^2} - \frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right) \\
&= \frac{be^2\sqrt{1-c^2x^2}}{c} - \frac{bcd^2\sqrt{1-c^2x^2}}{6x^2} - \frac{d^2(a+b\arcsin(cx))}{3x^3} - \frac{2de(a+b\arcsin(cx))}{x} \\
&\quad + e^2x(a+b\arcsin(cx)) - \frac{1}{6}\left(bcd\left(d+\frac{12e}{c^2}\right)\right)\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right) \\
&= \frac{be^2\sqrt{1-c^2x^2}}{c} - \frac{bcd^2\sqrt{1-c^2x^2}}{6x^2} - \frac{d^2(a+b\arcsin(cx))}{3x^3} - \frac{2de(a+b\arcsin(cx))}{x} \\
&\quad + e^2x(a+b\arcsin(cx)) - \frac{1}{6}bcd(c^2d+12e)\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x^4}\,dx = \frac{1}{6}\left(-\frac{2ad^2}{x^3}-\frac{12ade}{x}+6ae^2x+6b\left(\frac{e^2}{c}-\frac{cd^2}{6x^2}\right)\sqrt{1-c^2x^2}\right.$$
$$-\frac{2b(d^2+6dex^2-3e^2x^4)\arcsin(cx)}{x^3}$$
$$+bcd(c^2d+12e)\log(x)$$
$$\left.-bcd(c^2d+12e)\log\left(1+\sqrt{1-c^2x^2}\right)\right)$$

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] ((-2*a*d^2)/x^3 - (12*a*d*e)/x + 6*a*e^2*x + 6*b*(e^2/c - (c*d^2)/(6*x^2))*
Sqrt[1 - c^2*x^2] - (2*b*(d^2 + 6*d*e*x^2 - 3*e^2*x^4)*ArcSin[c*x])/x^3 + b
*c*d*(c^2*d + 12*e)*Log[x] - b*c*d*(c^2*d + 12*e)*Log[1 + Sqrt[1 - c^2*x^2]
])/6
```

Maple [A] (verified)

Time = 0.22 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.24

method	result
derivativedivides	$c^3\left(\frac{a\left(e^2cx-\frac{c\,d^2}{3x^3}-\frac{2cde}{x}\right)}{c^4}+\frac{b\left(\arcsin(cx)e^2cx-\frac{\arcsin(cx)c\,d^2}{3x^3}-\frac{2\arcsin(cx)cde}{x}+e^2\sqrt{-c^2x^2+1}+\frac{c^4d^2\left(-\frac{\sqrt{-c^2x^2+1}}{2c^2x^2}-\right.}{}\right.}{c^4}\right.$
default	$c^3\left(\frac{a\left(e^2cx-\frac{c\,d^2}{3x^3}-\frac{2cde}{x}\right)}{c^4}+\frac{b\left(\arcsin(cx)e^2cx-\frac{\arcsin(cx)c\,d^2}{3x^3}-\frac{2\arcsin(cx)cde}{x}+e^2\sqrt{-c^2x^2+1}+\frac{c^4d^2\left(-\frac{\sqrt{-c^2x^2+1}}{2c^2x^2}-\right.}{}\right.}{c^4}\right.$
parts	$a\left(e^2x-\frac{2de}{x}-\frac{d^2}{3x^3}\right)+b\,c^3\left(\frac{\arcsin(cx)x\,e^2}{c^3}-\frac{2\arcsin(cx)ed}{c^3x}-\frac{\arcsin(cx)d^2}{3c^3x^3}-\frac{-3e^2\sqrt{-c^2x^2+1}-c^4d^2\left(\right.}{}\right.$

[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)

[Out] c^3*(a/c^4*(e^2*c*x-1/3*c*d^2/x^3-2*c*d*e/x)+b/c^4*(arcsin(c*x)*e^2*c*x-1/3 *arcsin(c*x)*c*d^2/x^3-2*arcsin(c*x)*c*d*e/x+e^2*(-c^2*x^2+1)^(1/2)+1/3*c^4 *d^2*(-1/2/c^2/x^2*(-c^2*x^2+1)^(1/2)-1/2*arctanh(1/(-c^2*x^2+1)^(1/2)))-2* c^2*d*e*arctanh(1/(-c^2*x^2+1)^(1/2))))

Fricas [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.38

$$\int \frac{(d+ex^2)^2\,(a+b\arcsin(cx))}{x^4}\,dx$$
$$=\frac{12\,ace^2x^4-24\,acdex^2-(bc^4d^2+12\,bc^2de)x^3\log\left(\sqrt{-c^2x^2+1}+1\right)+(bc^4d^2+12\,bc^2de)x^3\log\left(\sqrt{-c^2x^2\right.}{12\,cx^3}$$

[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")

[Out] 1/12*(12*a*c*e^2*x^4 - 24*a*c*d*e*x^2 - (b*c^4*d^2 + 12*b*c^2*d*e)*x^3*log(sqrt(-c^2*x^2 + 1) + 1) + (b*c^4*d^2 + 12*b*c^2*d*e)*x^3*log(sqrt(-c^2*x^2

```
+ 1) - 1) - 4*a*c*d^2 + 4*(3*b*c*e^2*x^4 - 6*b*c*d*e*x^2 - b*c*d^2)*arcsin(
c*x) - 2*(b*c^2*d^2*x - 6*b*e^2*x^3)*sqrt(-c^2*x^2 + 1))/(c*x^3)
```

Sympy [A] (verification not implemented)

Time = 3.42 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.73

$$\int \frac{(d+ex^2)^2\,(a+b\arcsin(cx))}{x^4}\,dx$$
$$= -\frac{ad^2}{3x^3} - \frac{2ade}{x} + ae^2x + \frac{bcd^2\left(\begin{cases} -\frac{c^2\operatorname{acosh}\left(\frac{1}{cx}\right)}{2} + \frac{c}{2x\sqrt{-1+\frac{1}{c^2x^2}}} - \frac{1}{2cx^3\sqrt{-1+\frac{1}{c^2x^2}}} & \text{for } \frac{1}{|c^2x^2|} > 1 \\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx}\right)}{2} - \frac{ic\sqrt{1-\frac{1}{c^2x^2}}}{2x} & \text{otherwise} \end{cases}\right)}{3}$$
$$+ 2bcde\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|} > 1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) - \frac{bd^2\operatorname{asin}(cx)}{3x^3}$$
$$- \frac{2bde\operatorname{asin}(cx)}{x} + be^2\left(\begin{cases} 0 & \text{for } c = 0 \\ x\operatorname{asin}(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise} \end{cases}\right)$$

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))/x**4,x)
```

```
[Out] -a*d**2/(3*x**3) - 2*a*d*e/x + a*e**2*x + b*c*d**2*Piecewise((-c**2*acosh(1
/(c*x))/2 + c/(2*x*sqrt(-1 + 1/(c**2*x**2))) - 1/(2*c*x**3*sqrt(-1 + 1/(c**
2*x**2))), 1/Abs(c**2*x**2) > 1), (I*c**2*asin(1/(c*x))/2 - I*c*sqrt(1 - 1/
(c**2*x**2))/(2*x), True))/3 + 2*b*c*d*e*Piecewise((-acosh(1/(c*x)), 1/Abs(
c**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b*d**2*asin(c*x)/(3*x**3) - 2*b
*d*e*asin(c*x)/x + b*e**2*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**
2*x**2 + 1)/c, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 159, normalized size of antiderivative = 1.26

$$\int \frac{(d+ex^2)^2(a+b\arcsin(cx))}{x^4}\,dx$$
$$= -\frac{1}{6}\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\sqrt{-c^2x^2+1}}{x^2}\right)c+\frac{2\arcsin(cx)}{x^3}\right)bd^2$$
$$-2\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bde$$
$$+ae^2x+\frac{\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)be^2}{c}-\frac{2\,ade}{x}-\frac{ad^2}{3\,x^3}$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] -1/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqrt(-c^2*x^2 + 1)
/x^2)*c + 2*arcsin(c*x)/x^3)*b*d^2 - 2*(c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) +
 2/abs(x)) + arcsin(c*x)/x)*b*d*e + a*e^2*x + (c*x*arcsin(c*x) + sqrt(-c^2*
x^2 + 1))*b*e^2/c - 2*a*d*e/x - 1/3*a*d^2/x^3
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2534 vs. 2(114) = 228.

Time = 1.63 (sec) , antiderivative size = 2534, normalized size of antiderivative = 20.11

$$\int \frac{(d+ex^2)^2(a+b\arcsin(cx))}{x^4}\,dx = \text{Too large to display}$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] -1/24*b*c^12*d^2*x^8*arcsin(c*x)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4
*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) - 1/24*a*c^12*
d^2*x^8/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1)
+ 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) + 1/24*b*c^11*d^2*x^7/((c^6*x^5/(sqrt(-
c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 +
1) + 1)^7) - 1/6*b*c^10*d^2*x^6*arcsin(c*x)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) +
 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) - 1
/6*a*c^10*d^2*x^6/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2
*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) + 1/6*b*c^9*d^2*x^5*log(abs(c
)*abs(x))/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1
) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) - 1/6*b*c^9*d^2*x^5*log(sqrt(-c^2*x^2
 + 1) + 1)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 +
1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) + 1/24*b*c^9*d^2*x^5/((c^6*x^5/(sqrt
(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2
+ 1) + 1)^5) - b*c^8*d*e*x^6*arcsin(c*x)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)
```

```
^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) - 1/4*
b*c^8*d^2*x^4*arcsin(c*x)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) - a*c^8*d*e*x^6/((c^6
*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt
(-c^2*x^2 + 1) + 1)^6) - 1/4*a*c^8*d^2*x^4/((c^6*x^5/(sqrt(-c^2*x^2 + 1) +
1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) + 2*
b*c^7*d*e*x^5*log(abs(c)*abs(x))/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4
*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) + 1/6*b*c^7*d^
2*x^3*log(abs(c)*abs(x))/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) - 2*b*c^7*d*e*x^5*log(
sqrt(-c^2*x^2 + 1) + 1)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqr
t(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) - 1/6*b*c^7*d^2*x^3*log
(sqrt(-c^2*x^2 + 1) + 1)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) - 1/24*b*c^7*d^2*x^3/(
(c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(
sqrt(-c^2*x^2 + 1) + 1)^3) - 2*b*c^6*d*e*x^4*arcsin(c*x)/((c^6*x^5/(sqrt(-c
^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1
) + 1)^4) - 1/6*b*c^6*d^2*x^2*arcsin(c*x)/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1
)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^2) - 2*a
*c^6*d*e*x^4/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2
+ 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) - 1/6*a*c^6*d^2*x^2/((c^6*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2
 + 1) + 1)^2) + 2*b*c^5*d*e*x^3*log(abs(c)*abs(x))/((c^6*x^5/(sqrt(-c^2*x^2
 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)
^3) - 2*b*c^5*d*e*x^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^6*x^5/(sqrt(-c^2*x^2
+ 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^
3) - b*c^5*e^2*x^5/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^
2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) - 1/24*b*c^5*d^2*x/((c^6*x^5
/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^
2*x^2 + 1) + 1)) - 1/24*b*c^4*d^2*arcsin(c*x)/(c^6*x^5/(sqrt(-c^2*x^2 + 1)
+ 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3) + 2*b*c^4*e^2*x^4*arcsin(c*x)/
((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*
(sqrt(-c^2*x^2 + 1) + 1)^4) - b*c^4*d*e*x^2*arcsin(c*x)/((c^6*x^5/(sqrt(-c^
2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1)
 + 1)^2) - 1/24*a*c^4*d^2/(c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3) + 2*a*c^4*e^2*x^4/((c^6*x^5/(sqrt(-c^2*x^2 + 1) +
1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) - a*
c^4*d*e*x^2/((c^6*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 +
 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^2) + b*c^3*e^2*x^3/((c^6*x^5/(sqrt(-c^
2*x^2 + 1) + 1)^5 + c^4*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1)
 + 1)^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex^2)^2 (a+b\arcsin(cx))}{x^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\ (e\,x^2+d)^2}{x^4}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^2)/x^4,x)
[Out] int(((a + b*asin(c*x))*(d + e*x^2)^2)/x^4, x)
```

3.614 $\int x^4(d+ex^2)^3 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 341

$$\int x^4(d+ex^2)^3 (a+b\arcsin(cx))\,dx = \frac{b(231c^6d^3+495c^4d^2e+385c^2de^2+105e^3)\sqrt{1-c^2x^2}}{1155c^{11}} - \frac{b(462c^6d^3+1485c^4d^2e+1540c^2de^2+525e^3)(1-c^2x^2)^{3/2}}{3465c^{11}} + \frac{b(77c^6d^3+495c^4d^2e+770c^2de^2+350e^3)(1-c^2x^2)^{5/2}}{1925c^{11}} - \frac{be(99c^4d^2+308c^2de+210e^2)(1-c^2x^2)^{7/2}}{1617c^{11}} + \frac{be^2(11c^2d+15e)(1-c^2x^2)^{9/2}}{297c^{11}} - \frac{be^3(1-c^2x^2)^{11/2}}{121c^{11}} + \frac{1}{5}d^3x^5(a+b\arcsin(cx)) + \frac{3}{7}d^2ex^7(a+b\arcsin(cx)) + \frac{1}{3}de^2x^9(a+b\arcsin(cx)) + \frac{1}{11}e^3x^{11}(a+b\arcsin(cx))$$

```
[Out] -1/3465*b*(462*c^6*d^3+1485*c^4*d^2*e+1540*c^2*d*e^2+525*e^3)*(-c^2*x^2+1)^
(3/2)/c^11+1/1925*b*(77*c^6*d^3+495*c^4*d^2*e+770*c^2*d*e^2+350*e^3)*(-c^2*
x^2+1)^(5/2)/c^11-1/1617*b*e*(99*c^4*d^2+308*c^2*d*e+210*e^2)*(-c^2*x^2+1)^
(7/2)/c^11+1/297*b*e^2*(11*c^2*d+15*e)*(-c^2*x^2+1)^(9/2)/c^11-1/121*b*e^3*
(-c^2*x^2+1)^(11/2)/c^11+1/5*d^3*x^5*(a+b*arcsin(c*x))+3/7*d^2*e*x^7*(a+b*a
rcsin(c*x))+1/3*d*e^2*x^9*(a+b*arcsin(c*x))+1/11*e^3*x^11*(a+b*arcsin(c*x))
+1/1155*b*(231*c^6*d^3+495*c^4*d^2*e+385*c^2*d*e^2+105*e^3)*(-c^2*x^2+1)^(1
/2)/c^11
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 341, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {276, 4815, 12, 1813, 1634}

$$\int x^4(d+ex^2)^3(a+b\arcsin(cx))\,dx$$
$$=\frac{1}{5}d^3x^5(a+b\arcsin(cx))+\frac{3}{7}d^2ex^7(a+b\arcsin(cx))+\frac{1}{3}de^2x^9(a+b\arcsin(cx))$$
$$+\frac{1}{11}e^3x^{11}(a+b\arcsin(cx))+\frac{be^2(1-c^2x^2)^{9/2}(11c^2d+15e)}{297c^{11}}$$
$$-\frac{be^3(1-c^2x^2)^{11/2}}{121c^{11}}-\frac{be(1-c^2x^2)^{7/2}(99c^4d^2+308c^2de+210e^2)}{1617c^{11}}$$
$$+\frac{b(1-c^2x^2)^{5/2}(77c^6d^3+495c^4d^2e+770c^2de^2+350e^3)}{1925c^{11}}$$
$$-\frac{b(1-c^2x^2)^{3/2}(462c^6d^3+1485c^4d^2e+1540c^2de^2+525e^3)}{3465c^{11}}$$
$$+\frac{b\sqrt{1-c^2x^2}(231c^6d^3+495c^4d^2e+385c^2de^2+105e^3)}{1155c^{11}}$$

```
[In] Int[x^4*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(231*c^6*d^3 + 495*c^4*d^2*e + 385*c^2*d*e^2 + 105*e^3)*Sqrt[1 - c^2*x^2
])/(1155*c^11) - (b*(462*c^6*d^3 + 1485*c^4*d^2*e + 1540*c^2*d*e^2 + 525*e^
3)*(1 - c^2*x^2)^(3/2))/(3465*c^11) + (b*(77*c^6*d^3 + 495*c^4*d^2*e + 770*
c^2*d*e^2 + 350*e^3)*(1 - c^2*x^2)^(5/2))/(1925*c^11) - (b*e*(99*c^4*d^2 +
308*c^2*d*e + 210*e^2)*(1 - c^2*x^2)^(7/2))/(1617*c^11) + (b*e^2*(11*c^2*d
+ 15*e)*(1 - c^2*x^2)^(9/2))/(297*c^11) - (b*e^3*(1 - c^2*x^2)^(11/2))/(121
*c^11) + (d^3*x^5*(a + b*ArcSin[c*x]))/5 + (3*d^2*e*x^7*(a + b*ArcSin[c*x])
)/7 + (d*e^2*x^9*(a + b*ArcSin[c*x]))/3 + (e^3*x^11*(a + b*ArcSin[c*x]))/11
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
```

```
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{5}d^3x^5(a+b\arcsin(cx))+\frac{3}{7}d^2ex^7(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}de^2x^9(a+b\arcsin(cx))+\frac{1}{11}e^3x^{11}(a+b\arcsin(cx)) \\
&\quad-(bc)\int\frac{x^5(231d^3+495d^2ex^2+385de^2x^4+105e^3x^6)}{1155\sqrt{1-c^2x^2}}\,dx \\
&= \frac{1}{5}d^3x^5(a+b\arcsin(cx))+\frac{3}{7}d^2ex^7(a+b\arcsin(cx))+\frac{1}{3}de^2x^9(a+b\arcsin(cx)) \\
&\quad+\frac{1}{11}e^3x^{11}(a+b\arcsin(cx))-\frac{(bc)\int\frac{x^5(231d^3+495d^2ex^2+385de^2x^4+105e^3x^6)}{\sqrt{1-c^2x^2}}\,dx}{1155} \\
&= \frac{1}{5}d^3x^5(a+b\arcsin(cx))+\frac{3}{7}d^2ex^7(a+b\arcsin(cx))+\frac{1}{3}de^2x^9(a+b\arcsin(cx)) \\
&\quad+\frac{1}{11}e^3x^{11}(a+b\arcsin(cx))-\frac{(bc)\text{Subst}\left(\int\frac{x^2(231d^3+495d^2ex+385de^2x^2+105e^3x^3)}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2310} \\
&= \frac{1}{5}d^3x^5(a+b\arcsin(cx))+\frac{3}{7}d^2ex^7(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}de^2x^9(a+b\arcsin(cx))+\frac{1}{11}e^3x^{11}(a+b\arcsin(cx)) \\
&\quad-\frac{(bc)\text{Subst}\left(\int\left(\frac{231c^6d^3+495c^4d^2e+385c^2de^2+105e^3}{c^{10}\sqrt{1-c^2x}}+\frac{(-462c^6d^3-1485c^4d^2e-1540c^2de^2-525e^3)\sqrt{1-c^2x}}{c^{10}}+\frac{3(77c^6d^3+4\right.\right.}{}
\end{aligned}$$

$$= \frac{b(231c^6d^3+495c^4d^2e+385c^2de^2+105e^3)\sqrt{1-c^2x^2}}{1155c^{11}} - \frac{b(462c^6d^3+1485c^4d^2e+1540c^2de^2+525e^3)(1-c^2x^2)^{3/2}}{3465c^{11}} + \frac{b(77c^6d^3+495c^4d^2e+770c^2de^2+350e^3)(1-c^2x^2)^{5/2}}{1925c^{11}} - \frac{be(99c^4d^2+308c^2de+210e^2)(1-c^2x^2)^{7/2}}{1617c^{11}} + \frac{be^2(11c^2d+15e)(1-c^2x^2)^{9/2}}{297c^{11}} - \frac{be^3(1-c^2x^2)^{11/2}}{121c^{11}} + \frac{1}{5}d^3x^5(a+b\arcsin(cx)) + \frac{3}{7}d^2ex^7(a+b\arcsin(cx)) + \frac{1}{3}de^2x^9(a+b\arcsin(cx)) + \frac{1}{11}e^3x^{11}(a+b\arcs$$

Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 271, normalized size of antiderivative = 0.79

$$\int x^4(d+ex^2)^3(a+b\arcsin(cx))\,dx = \frac{3465ax^5(231d^3+495d^2ex^2+385de^2x^4+105e^3x^6) + \frac{b\sqrt{1-c^2x^2}(134400e^3+4480c^2e^2(121d+15ex^2)+80c^4e(9801d^2+3388de}{}}{}$$

```
[In] Integrate[x^4*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (3465*a*x^5*(231*d^3 + 495*d^2*e*x^2 + 385*d*e^2*x^4 + 105*e^3*x^6) + (b*Sq
rt[1 - c^2*x^2]*(134400*e^3 + 4480*c^2*e^2*(121*d + 15*e*x^2) + 80*c^4*e*(9
801*d^2 + 3388*d*e*x^2 + 630*e^2*x^4) + 24*c^6*(17787*d^3 + 16335*d^2*e*x^2
 + 8470*d*e^2*x^4 + 1750*e^3*x^6) + c^10*x^4*(160083*d^3 + 245025*d^2*e*x^2
 + 148225*d*e^2*x^4 + 33075*e^3*x^6) + 2*c^8*(106722*d^3*x^2 + 147015*d^2*e
*x^4 + 84700*d*e^2*x^6 + 18375*e^3*x^8)))/c^11 + 3465*b*x^5*(231*d^3 + 495*
d^2*e*x^2 + 385*d*e^2*x^4 + 105*e^3*x^6)*ArcSin[c*x])/4002075
```

Maple [A] (verified)

Time = 0.25 (sec) , antiderivative size = 484, normalized size of antiderivative = 1.42

method	result
parts	$a\left(\frac{1}{11}e^3x^{11}+\frac{1}{3}d\,e^2x^9+\frac{3}{7}d^2e\,x^7+\frac{1}{5}d^3x^5\right)+\frac{b\left(\frac{c^5\arcsin(cx)e^3x^{11}}{11}+\frac{c^5\arcsin(cx)d\,e^2x^9}{3}+\frac{3c^5\arcsin(cx)d^2e\,x^7}{7}\cdots\right.}{\cdots}$
derivativedivides	$\frac{a\left(\frac{1}{5}d^3c^{11}x^5+\frac{3}{7}d^2c^{11}e\,x^7+\frac{1}{3}d\,c^{11}e^2x^9+\frac{1}{11}e^3c^{11}x^{11}\right)}{c^6}+\frac{b\left(\frac{\arcsin(cx)d^3c^{11}x^5}{5}+\frac{3\arcsin(cx)d^2c^{11}e\,x^7}{7}+\frac{\arcsin(cx)d\,c^{11}e^2x^9}{3}+\cdots\right.}{\cdots}$
default	$\frac{a\left(\frac{1}{5}d^3c^{11}x^5+\frac{3}{7}d^2c^{11}e\,x^7+\frac{1}{3}d\,c^{11}e^2x^9+\frac{1}{11}e^3c^{11}x^{11}\right)}{c^6}+\frac{b\left(\frac{\arcsin(cx)d^3c^{11}x^5}{5}+\frac{3\arcsin(cx)d^2c^{11}e\,x^7}{7}+\frac{\arcsin(cx)d\,c^{11}e^2x^9}{3}+\cdots\right.}{\cdots}$

```
[In] int(x^4*(e*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/11*e^3*x^11+1/3*d*e^2*x^9+3/7*d^2*e*x^7+1/5*d^3*x^5)+b/c^5*(1/11*c^5*a
rcsin(c*x)*e^3*x^11+1/3*c^5*arcsin(c*x)*d*e^2*x^9+3/7*c^5*arcsin(c*x)*d^2*e
*x^7+1/5*arcsin(c*x)*c^5*x^5*d^3-1/1155/c^6*(105*e^3*(-1/11*c^10*x^10*(-c^2
*x^2+1)^(1/2)-10/99*c^8*x^8*(-c^2*x^2+1)^(1/2)-80/693*c^6*x^6*(-c^2*x^2+1)^
(1/2)-32/231*c^4*x^4*(-c^2*x^2+1)^(1/2)-128/693*c^2*x^2*(-c^2*x^2+1)^(1/2)-
256/693*(-c^2*x^2+1)^(1/2))+231*d^3*c^6*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/
15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))+385*d*c^2*e^2*(-1/9*
c^8*x^8*(-c^2*x^2+1)^(1/2)-8/63*c^6*x^6*(-c^2*x^2+1)^(1/2)-16/105*c^4*x^4*(
-c^2*x^2+1)^(1/2)-64/315*c^2*x^2*(-c^2*x^2+1)^(1/2)-128/315*(-c^2*x^2+1)^(1
/2))+495*d^2*c^4*e*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+
1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 322, normalized size of antiderivative = 0.94

$$\int x^4\left(d+ex^2\right)^3\left(a+b\arcsin(cx)\right)dx$$
$$=\frac{363825\,ac^{11}e^3x^{11}+1334025\,ac^{11}de^2x^9+1715175\,ac^{11}d^2ex^7+800415\,ac^{11}d^3x^5+3465\,(105\,bc^{11}e^3x^{11}+385\cdots}{\cdots}$$

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/4002075*(363825*a*c^11*e^3*x^11 + 1334025*a*c^11*d*e^2*x^9 + 1715175*a*c^
11*d^2*e*x^7 + 800415*a*c^11*d^3*x^5 + 3465*(105*b*c^11*e^3*x^11 + 385*b*c^
11*d*e^2*x^9 + 495*b*c^11*d^2*e*x^7 + 231*b*c^11*d^3*x^5)*arcsin(c*x) + (33
075*b*c^10*e^3*x^10 + 426888*b*c^6*d^3 + 1225*(121*b*c^10*d*e^2 + 30*b*c^8*
e^3)*x^8 + 784080*b*c^4*d^2*e + 25*(9801*b*c^10*d^2*e + 6776*b*c^8*d*e^2 +
1680*b*c^6*e^3)*x^6 + 542080*b*c^2*d*e^2 + 3*(53361*b*c^10*d^3 + 98010*b*c^
```

```
8*d^2*e + 67760*b*c^6*d*e^2 + 16800*b*c^4*e^3)*x^4 + 134400*b*e^3 + 4*(5336
1*b*c^8*d^3 + 98010*b*c^6*d^2*e + 67760*b*c^4*d*e^2 + 16800*b*c^2*e^3)*x^2)
*sqrt(-c^2*x^2 + 1))/c^11
```

Sympy [A] (verification not implemented)

Time = 2.35 (sec) , antiderivative size = 631, normalized size of antiderivative = 1.85

$$\int x^4(d+ex^2)^3(a+b\arcsin(cx))\,dx$$
$$=\begin{cases} \frac{ad^3x^5}{5}+\frac{3ad^2ex^7}{7}+\frac{ade^2x^9}{3}+\frac{ae^3x^{11}}{11}+\frac{bd^3x^5\operatorname{asin}(cx)}{5}+\frac{3bd^2ex^7\operatorname{asin}(cx)}{7}+\frac{bde^2x^9\operatorname{asin}(cx)}{3}+\frac{be^3x^{11}\operatorname{asin}(cx)}{11}+\frac{bd^3x^4\sqrt{-c^2}}{25c} \\ a\left(\frac{d^3x^5}{5}+\frac{3d^2ex^7}{7}+\frac{de^2x^9}{3}+\frac{e^3x^{11}}{11}\right) \end{cases}$$

```
[In] integrate(x**4*(e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**5/5 + 3*a*d**2*e*x**7/7 + a*d*e**2*x**9/3 + a*e**3*x**
11/11 + b*d**3*x**5*asin(c*x)/5 + 3*b*d**2*e*x**7*asin(c*x)/7 + b*d*e**2*x*
*9*asin(c*x)/3 + b*e**3*x**11*asin(c*x)/11 + b*d**3*x**4*sqrt(-c**2*x**2 +
1)/(25*c) + 3*b*d**2*e*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + b*d*e**2*x**8*sqr
t(-c**2*x**2 + 1)/(27*c) + b*e**3*x**10*sqrt(-c**2*x**2 + 1)/(121*c) + 4*b*
d**3*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 18*b*d**2*e*x**4*sqrt(-c**2*x**2
 + 1)/(245*c**3) + 8*b*d*e**2*x**6*sqrt(-c**2*x**2 + 1)/(189*c**3) + 10*b*e
**3*x**8*sqrt(-c**2*x**2 + 1)/(1089*c**3) + 8*b*d**3*sqrt(-c**2*x**2 + 1)/(
75*c**5) + 24*b*d**2*e*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*d*e**2*x
**4*sqrt(-c**2*x**2 + 1)/(315*c**5) + 80*b*e**3*x**6*sqrt(-c**2*x**2 + 1)/(
7623*c**5) + 48*b*d**2*e*sqrt(-c**2*x**2 + 1)/(245*c**7) + 64*b*d*e**2*x**2
*sqrt(-c**2*x**2 + 1)/(945*c**7) + 32*b*e**3*x**4*sqrt(-c**2*x**2 + 1)/(254
1*c**7) + 128*b*d*e**2*sqrt(-c**2*x**2 + 1)/(945*c**9) + 128*b*e**3*x**2*sq
rt(-c**2*x**2 + 1)/(7623*c**9) + 256*b*e**3*sqrt(-c**2*x**2 + 1)/(7623*c**1
1), Ne(c, 0)), (a*(d**3*x**5/5 + 3*d**2*e*x**7/7 + d*e**2*x**9/3 + e**3*x**
11/11), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 465, normalized size of antiderivative = 1.36

$$\int x^4\left(d+ex^2\right)^3\left(a+b\arcsin(cx)\right)dx = \frac{1}{11}ae^3x^{11}+\frac{1}{3}ade^2x^9+\frac{3}{7}ad^2ex^7+\frac{1}{5}ad^3x^5 + \frac{1}{75}\left(15\,x^5\arcsin\left(cx\right)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd^3 + \frac{3}{245}\left(35\,x^7\arcsin\left(cx\right)+\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2}+\frac{6\sqrt{-c^2x^2+1}x^4}{c^4}+\frac{8\sqrt{-c^2x^2+1}x^2}{c^6}+\frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right. + \frac{1}{945}\left(315\,x^9\arcsin\left(cx\right)+\left(\frac{35\sqrt{-c^2x^2+1}x^8}{c^2}+\frac{40\sqrt{-c^2x^2+1}x^6}{c^4}+\frac{48\sqrt{-c^2x^2+1}x^4}{c^6}+\frac{64\sqrt{-c^2x^2+}}{c^8}\right.\right. + \frac{1}{7623}\left(693\,x^{11}\arcsin\left(cx\right)+\left(\frac{63\sqrt{-c^2x^2+1}x^{10}}{c^2}+\frac{70\sqrt{-c^2x^2+1}x^8}{c^4}+\frac{80\sqrt{-c^2x^2+1}x^6}{c^6}+\frac{96\sqrt{-c^2x^2}}{c^8}\right.\right.$$

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/11*a*e^3*x^11 + 1/3*a*d*e^2*x^9 + 3/7*a*d^2*e*x^7 + 1/5*a*d^3*x^5 + 1/75*
(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*
x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d^3 + 3/245*(35*x^7*arcsin(c*x) +
(5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*
x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*d^2*e + 1/945*(315*x^9*a
rcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^2*x^2 + 1)*x^6/c^4
 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*x^2/c^8 + 128*sqrt
(-c^2*x^2 + 1)/c^10)*c)*b*d*e^2 + 1/7623*(693*x^11*arcsin(c*x) + (63*sqrt(-
c^2*x^2 + 1)*x^10/c^2 + 70*sqrt(-c^2*x^2 + 1)*x^8/c^4 + 80*sqrt(-c^2*x^2 +
1)*x^6/c^6 + 96*sqrt(-c^2*x^2 + 1)*x^4/c^8 + 128*sqrt(-c^2*x^2 + 1)*x^2/c^1
0 + 256*sqrt(-c^2*x^2 + 1)/c^12)*c)*b*e^3
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 943 vs. 2(309) = 618.

Time = 0.32 (sec) , antiderivative size = 943, normalized size of antiderivative = 2.77

$$\int x^4\left(d+ex^2\right)^3\left(a+b\arcsin(cx)\right)dx = \text{Too large to display}$$

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/11*a*e^3*x^11 + 1/3*a*d*e^2*x^9 + 3/7*a*d^2*e*x^7 + 1/5*a*d^3*x^5 + 1/5*(
c^2*x^2 - 1)^2*b*d^3*x*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*d^3*x*arcsin(c
```

```
*x)/c^4 + 3/7*(c^2*x^2 - 1)^3*b*d^2*e*x*arcsin(c*x)/c^6 + 1/5*b*d^3*x*arcsi
n(c*x)/c^4 + 9/7*(c^2*x^2 - 1)^2*b*d^2*e*x*arcsin(c*x)/c^6 + 1/3*(c^2*x^2 -
 1)^4*b*d*e^2*x*arcsin(c*x)/c^8 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b
*d^3/c^5 + 9/7*(c^2*x^2 - 1)*b*d^2*e*x*arcsin(c*x)/c^6 + 4/3*(c^2*x^2 - 1)^
3*b*d*e^2*x*arcsin(c*x)/c^8 + 1/11*(c^2*x^2 - 1)^5*b*e^3*x*arcsin(c*x)/c^10
 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*d^3/c^5 + 3/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2
 + 1)*b*d^2*e/c^7 + 3/7*b*d^2*e*x*arcsin(c*x)/c^6 + 2*(c^2*x^2 - 1)^2*b*d*e
^2*x*arcsin(c*x)/c^8 + 5/11*(c^2*x^2 - 1)^4*b*e^3*x*arcsin(c*x)/c^10 + 1/5*
sqrt(-c^2*x^2 + 1)*b*d^3/c^5 + 9/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d^
2*e/c^7 + 1/27*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^9 + 4/3*(c^2*x^
2 - 1)*b*d*e^2*x*arcsin(c*x)/c^8 + 10/11*(c^2*x^2 - 1)^3*b*e^3*x*arcsin(c*x
)/c^10 - 3/7*(-c^2*x^2 + 1)^(3/2)*b*d^2*e/c^7 + 4/21*(c^2*x^2 - 1)^3*sqrt(-
c^2*x^2 + 1)*b*d*e^2/c^9 + 1/121*(c^2*x^2 - 1)^5*sqrt(-c^2*x^2 + 1)*b*e^3/c
^11 + 1/3*b*d*e^2*x*arcsin(c*x)/c^8 + 10/11*(c^2*x^2 - 1)^2*b*e^3*x*arcsin(
c*x)/c^10 + 3/7*sqrt(-c^2*x^2 + 1)*b*d^2*e/c^7 + 2/5*(c^2*x^2 - 1)^2*sqrt(-
c^2*x^2 + 1)*b*d*e^2/c^9 + 5/99*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*e^3/c^
11 + 5/11*(c^2*x^2 - 1)*b*e^3*x*arcsin(c*x)/c^10 - 4/9*(-c^2*x^2 + 1)^(3/2)
*b*d*e^2/c^9 + 10/77*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^3/c^11 + 1/11*b
*e^3*x*arcsin(c*x)/c^10 + 1/3*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^9 + 2/11*(c^2*x^
2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^3/c^11 - 5/33*(-c^2*x^2 + 1)^(3/2)*b*e^3/c^
11 + 1/11*sqrt(-c^2*x^2 + 1)*b*e^3/c^11
```

Mupad [F(-1)]

Timed out.

$$\int x^4 (d+ex^2)^3 (a+b\arcsin(cx))\,dx = \int x^4\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^3\,dx$$

```
[In] int(x^4*(a + b*asin(c*x))*(d + e*x^2)^3,x)
[Out] int(x^4*(a + b*asin(c*x))*(d + e*x^2)^3, x)
```

3.615 $\int x^3(d+ex^2)^3 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 380

$$\begin{aligned}\int x^3(d+ex^2)^3 (a+b\arcsin(cx))\,dx &= -\frac{b(1232c^8d^4-2536c^6d^3e-7758c^4d^2e^2-6615c^2de^3-1890e^4)\,x\sqrt{1-c^2x^2}}{76800c^9e}\\ &\quad-\frac{b(136c^6d^3-1096c^4d^2e-1617c^2de^2-630e^3)\,x\sqrt{1-c^2x^2}(d+ex^2)}{38400c^7e}\\ &\quad+\frac{b(26c^4d^2+201c^2de+126e^2)\,x\sqrt{1-c^2x^2}(d+ex^2)^2}{9600c^5e}\\ &\quad+\frac{b(11c^2d+18e)\,x\sqrt{1-c^2x^2}(d+ex^2)^3}{1600c^3e}+\frac{bx\sqrt{1-c^2x^2}(d+ex^2)^4}{100ce}\\ &\quad+\frac{b(128c^{10}d^5-480c^6d^3e^2-800c^4d^2e^3-525c^2de^4-126e^5)\arcsin(cx)}{5120c^{10}e^2}\\ &\quad-\frac{d(d+ex^2)^4(a+b\arcsin(cx))}{8e^2}+\frac{(d+ex^2)^5(a+b\arcsin(cx))}{10e^2}\end{aligned}$$

```
[Out] 1/5120*b*(128*c^10*d^5-480*c^6*d^3*e^2-800*c^4*d^2*e^3-525*c^2*d*e^4-126*e^
5)*arcsin(c*x)/c^10/e^2-1/8*d*(e*x^2+d)^4*(a+b*arcsin(c*x))/e^2+1/10*(e*x^2
+d)^5*(a+b*arcsin(c*x))/e^2-1/76800*b*(1232*c^8*d^4-2536*c^6*d^3*e-7758*c^4
*d^2*e^2-6615*c^2*d*e^3-1890*e^4)*x*(-c^2*x^2+1)^(1/2)/c^9/e-1/38400*b*(136
*c^6*d^3-1096*c^4*d^2*e-1617*c^2*d*e^2-630*e^3)*x*(e*x^2+d)*(-c^2*x^2+1)^(1
/2)/c^7/e+1/9600*b*(26*c^4*d^2+201*c^2*d*e+126*e^2)*x*(e*x^2+d)^2*(-c^2*x^2
+1)^(1/2)/c^5/e+1/1600*b*(11*c^2*d+18*e)*x*(e*x^2+d)^3*(-c^2*x^2+1)^(1/2)/c
^3/e+1/100*b*x*(e*x^2+d)^4*(-c^2*x^2+1)^(1/2)/c/e
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 380, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {272, 45, 4815, 12, 542, 396, 222}

$$\begin{aligned}
&\int x^3\left(d+ex^2\right)^3(a+b\arcsin(cx))\,dx\\
&=\frac{\left(d+ex^2\right)^5(a+b\arcsin(cx))}{10e^2}-\frac{d\left(d+ex^2\right)^4(a+b\arcsin(cx))}{8e^2}\\
&\quad+\frac{b\arcsin(cx)\left(128c^{10}d^5-480c^6d^3e^2-800c^4d^2e^3-525c^2de^4-126e^5\right)}{5120c^{10}e^2}\\
&\quad+\frac{bx\sqrt{1-c^2x^2}\left(d+ex^2\right)^4}{100ce}+\frac{bx\sqrt{1-c^2x^2}\left(11c^2d+18e\right)\left(d+ex^2\right)^3}{1600c^3e}\\
&\quad+\frac{bx\sqrt{1-c^2x^2}\left(26c^4d^2+201c^2de+126e^2\right)\left(d+ex^2\right)^2}{9600c^5e}\\
&\quad-\frac{bx\sqrt{1-c^2x^2}\left(136c^6d^3-1096c^4d^2e-1617c^2de^2-630e^3\right)\left(d+ex^2\right)}{38400c^7e}\\
&\quad-\frac{bx\sqrt{1-c^2x^2}\left(1232c^8d^4-2536c^6d^3e-7758c^4d^2e^2-6615c^2de^3-1890e^4\right)}{76800c^9e}
\end{aligned}$$

```
[In] Int[x^3*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] -1/76800*(b*(1232*c^8*d^4 - 2536*c^6*d^3*e - 7758*c^4*d^2*e^2 - 6615*c^2*d*
e^3 - 1890*e^4)*x*Sqrt[1 - c^2*x^2])/(c^9*e) - (b*(136*c^6*d^3 - 1096*c^4*d
^2*e - 1617*c^2*d*e^2 - 630*e^3)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2))/(38400*c^
7*e) + (b*(26*c^4*d^2 + 201*c^2*d*e + 126*e^2)*x*Sqrt[1 - c^2*x^2]*(d + e*x
^2)^2)/(9600*c^5*e) + (b*(11*c^2*d + 18*e)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^
3)/(1600*c^3*e) + (b*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^4)/(100*c*e) + (b*(128
*c^10*d^5 - 480*c^6*d^3*e^2 - 800*c^4*d^2*e^3 - 525*c^2*d*e^4 - 126*e^5)*Ar
cSin[c*x])/(5120*c^10*e^2) - (d*(d + e*x^2)^4*(a + b*ArcSin[c*x]))/(8*e^2)
+ ((d + e*x^2)^5*(a + b*ArcSin[c*x]))/(10*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 542

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[f*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^q/(
b*(n*(p + q + 1) + 1))), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d(d+ex^2)^4(a+b\arcsin(cx))}{8e^2}+\frac{(d+ex^2)^5(a+b\arcsin(cx))}{10e^2} \\
&\quad -(bc)\int\frac{(d+ex^2)^4(-d+4ex^2)}{40e^2\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d(d+ex^2)^4(a+b\arcsin(cx))}{8e^2}+\frac{(d+ex^2)^5(a+b\arcsin(cx))}{10e^2}-\frac{(bc)\int\frac{(d+ex^2)^4(-d+4ex^2)}{\sqrt{1-c^2x^2}}\,dx}{40e^2} \\
&= \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^4}{100ce}-\frac{d(d+ex^2)^4(a+b\arcsin(cx))}{8e^2} \\
&\quad +\frac{(d+ex^2)^5(a+b\arcsin(cx))}{10e^2}+\frac{b\int\frac{(d+ex^2)^3(2d(5c^2d-2e)-2e(11c^2d+18e)x^2)}{\sqrt{1-c^2x^2}}\,dx}{400ce^2}
\end{aligned}$$

$$= \frac{b(11c^2d+18e)\,x\sqrt{1-c^2x^2}(d+ex^2)^3}{1600c^3e} + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^4}{100ce} - \frac{d(d+ex^2)^4\,(a+b\arcsin(cx))}{8e^2} + \frac{(d+ex^2)^5\,(a+b\arcsin(cx))}{10e^2} - \frac{b\int \frac{(d+ex^2)^2(-2d(40c^4d^2-27c^2de-18e^2)+2e(26c^4d^2+201c^2de+126e^2)x^2)}{\sqrt{1-c^2x^2}}\,dx}{3200c^3e^2}$$

$$= \frac{b(26c^4d^2+201c^2de+126e^2)\,x\sqrt{1-c^2x^2}(d+ex^2)^2}{9600c^5e} + \frac{b(11c^2d+18e)\,x\sqrt{1-c^2x^2}(d+ex^2)^3}{1600c^3e} + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^4}{100ce} - \frac{d(d+ex^2)^4\,(a+b\arcsin(cx))}{8e^2} + \frac{(d+ex^2)^5\,(a+b\arcsin(cx))}{10e^2} + \frac{b\int \frac{(d+ex^2)(2d(240c^6d^3-188c^4d^2e-309c^2de^2-126e^3)+2e(136c^6d^3-1096c^4d^2e-1617c^2de^2-630e^3)x^2)}{\sqrt{1-c^2x^2}}\,dx}{19200c^5e^2}$$

$$= -\frac{b(136c^6d^3-1096c^4d^2e-1617c^2de^2-630e^3)\,x\sqrt{1-c^2x^2}(d+ex^2)}{38400c^7e} + \frac{b(26c^4d^2+201c^2de+126e^2)\,x\sqrt{1-c^2x^2}(d+ex^2)^2}{9600c^5e} + \frac{b(11c^2d+18e)\,x\sqrt{1-c^2x^2}(d+ex^2)^3}{1600c^3e} + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^4}{100ce} - \frac{d(d+ex^2)^4\,(a+b\arcsin(cx))}{8e^2} + \frac{(d+ex^2)^5\,(a+b\arcsin(cx))}{10e^2} - \frac{b\int \frac{-2d(960c^8d^4-616c^6d^3e-2332c^4d^2e^2-2121c^2de^3-630e^4)-2e(1232c^8d^4-2536c^6d^3e-7758c^4d^2e^2-6615c^2de^3-1890e^4)x^2}{\sqrt{1-c^2x^2}}\,dx}{76800c^7e^2}$$

$$= -\frac{b(1232c^8d^4-2536c^6d^3e-7758c^4d^2e^2-6615c^2de^3-1890e^4)\,x\sqrt{1-c^2x^2}}{76800c^9e} - \frac{b(136c^6d^3-1096c^4d^2e-1617c^2de^2-630e^3)\,x\sqrt{1-c^2x^2}(d+ex^2)}{38400c^7e} + \frac{b(26c^4d^2+201c^2de+126e^2)\,x\sqrt{1-c^2x^2}(d+ex^2)^2}{9600c^5e} + \frac{b(11c^2d+18e)\,x\sqrt{1-c^2x^2}(d+ex^2)^3}{1600c^3e} + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^4}{100ce} - \frac{d(d+ex^2)^4\,(a+b\arcsin(cx))}{8e^2} + \frac{(d+ex^2)^5\,(a+b\arcsin(cx))}{10e^2} + \frac{(b(128c^{10}d^5-480c^6d^3e^2-800c^4d^2e^3-525c^2de^4-126e^5))\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{5120c^9e^2}$$

$$= -\frac{b(1232c^8d^4 - 2536c^6d^3e - 7758c^4d^2e^2 - 6615c^2de^3 - 1890e^4)\,x\sqrt{1-c^2x^2}}{76800c^9e} - \frac{b(136c^6d^3 - 1096c^4d^2e - 1617c^2de^2 - 630e^3)\,x\sqrt{1-c^2x^2}(d+ex^2)}{38400c^7e} + \frac{b(26c^4d^2 + 201c^2de + 126e^2)\,x\sqrt{1-c^2x^2}(d+ex^2)^2}{9600c^5e} + \frac{b(11c^2d + 18e)\,x\sqrt{1-c^2x^2}(d+ex^2)^3}{1600c^3e} + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^4}{100ce} + \frac{b(128c^{10}d^5 - 480c^6d^3e^2 - 800c^4d^2e^3 - 525c^2de^4 - 126e^5)\arcsin(cx)}{5120c^{10}e^2} - \frac{d(d+ex^2)^4\,(a+b\arcsin(cx))}{8e^2} + \frac{(d+ex^2)^5\,(a+b\arcsin(cx))}{10e^2}$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 276, normalized size of antiderivative = 0.73

$$\int x^3\left(d+ex^2\right)^3(a+b\arcsin(cx))\,dx = \frac{cx\left(1920ac^9x^3(10d^3+20d^2ex^2+15de^2x^4+4e^3x^6)+b\sqrt{1-c^2x^2}(1890e^3+315c^2e^2(25d+4ex^2)+6c^4e(200\right.}{}$$

```
[In] Integrate[x^3*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (c*x*(1920*a*c^9*x^3*(10*d^3 + 20*d^2*e*x^2 + 15*d*e^2*x^4 + 4*e^3*x^6) + b
*Sqrt[1 - c^2*x^2]*(1890*e^3 + 315*c^2*e^2*(25*d + 4*e*x^2) + 6*c^4*e*(2000
*d^2 + 875*d*e*x^2 + 168*e^2*x^4) + 8*c^6*(900*d^3 + 1000*d^2*e*x^2 + 525*d
*e^2*x^4 + 108*e^3*x^6) + 16*c^8*(300*d^3*x^2 + 400*d^2*e*x^4 + 225*d*e^2*x
^6 + 48*e^3*x^8))) + 15*b*(-480*c^6*d^3 - 800*c^4*d^2*e - 525*c^2*d*e^2 - 1
26*e^3 + 128*c^10*x^4*(10*d^3 + 20*d^2*e*x^2 + 15*d*e^2*x^4 + 4*e^3*x^6))*A
rcSin[c*x])/(76800*c^10)
```

Maple [A] (verified)

Time = 0.25 (sec) , antiderivative size = 436, normalized size of antiderivative = 1.15

method	result
parts	$a\left(\frac{1}{10}e^3x^{10}+\frac{3}{8}d\,e^2x^8+\frac{1}{2}d^2e\,x^6+\frac{1}{4}d^3x^4\right)+\frac{b\left(\frac{c^4\arcsin(cx)e^3x^{10}}{10}+\frac{3c^4\arcsin(cx)d\,e^2x^8}{8}+\frac{c^4\arcsin(cx)d^2e\,x^6}{2}\right.}{}$
derivativedivides	$\frac{a\left(\frac{1}{4}d^3c^{10}x^4+\frac{1}{2}d^2c^{10}e\,x^6+\frac{3}{8}d\,c^{10}e^2x^8+\frac{1}{10}e^3c^{10}x^{10}\right)}{c^6}+\frac{b\left(\frac{\arcsin(cx)d^3c^{10}x^4}{4}+\frac{\arcsin(cx)d^2c^{10}e\,x^6}{2}+\frac{3\arcsin(cx)d\,c^{10}e^2x^8}{8}+\text{arc}\right.}{}$
default	$\frac{a\left(\frac{1}{4}d^3c^{10}x^4+\frac{1}{2}d^2c^{10}e\,x^6+\frac{3}{8}d\,c^{10}e^2x^8+\frac{1}{10}e^3c^{10}x^{10}\right)}{c^6}+\frac{b\left(\frac{\arcsin(cx)d^3c^{10}x^4}{4}+\frac{\arcsin(cx)d^2c^{10}e\,x^6}{2}+\frac{3\arcsin(cx)d\,c^{10}e^2x^8}{8}+\text{arc}\right.}{}$

```
[In] int(x^3*(e*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/10*e^3*x^10+3/8*d*e^2*x^8+1/2*d^2*e*x^6+1/4*d^3*x^4)+b/c^4*(1/10*c^4*a
rcsin(c*x)*e^3*x^10+3/8*c^4*arcsin(c*x)*d*e^2*x^8+1/2*c^4*arcsin(c*x)*d^2*e
*x^6+1/4*arcsin(c*x)*c^4*x^4*d^3-1/40/c^6*(4*e^3*(-1/10*c^9*x^9*(-c^2*x^2+1
)^(1/2)-9/80*c^7*x^7*(-c^2*x^2+1)^(1/2)-21/160*c^5*x^5*(-c^2*x^2+1)^(1/2)-2
1/128*c^3*x^3*(-c^2*x^2+1)^(1/2)-63/256*c*x*(-c^2*x^2+1)^(1/2)+63/256*arcsi
n(c*x))+10*d^3*c^6*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1
/2)+3/8*arcsin(c*x))+15*d*c^2*e^2*(-1/8*c^7*x^7*(-c^2*x^2+1)^(1/2)-7/48*c^5
*x^5*(-c^2*x^2+1)^(1/2)-35/192*c^3*x^3*(-c^2*x^2+1)^(1/2)-35/128*c*x*(-c^2*
x^2+1)^(1/2)+35/128*arcsin(c*x))+20*d^2*c^4*e*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1
/2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin
(c*x))))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 318, normalized size of antiderivative = 0.84

$$\int x^3\left(d+ex^2\right)^3\left(a+b\arcsin(cx)\right)dx$$
$$=\frac{7680\,ac^{10}e^3x^{10}+28800\,ac^{10}de^2x^8+38400\,ac^{10}d^2ex^6+19200\,ac^{10}d^3x^4+15\left(512\,bc^{10}e^3x^{10}+1920\,bc^{10}de^2x\right.}{}$$

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/76800*(7680*a*c^10*e^3*x^10 + 28800*a*c^10*d*e^2*x^8 + 38400*a*c^10*d^2*e
*x^6 + 19200*a*c^10*d^3*x^4 + 15*(512*b*c^10*e^3*x^10 + 1920*b*c^10*d*e^2*x
^8 + 2560*b*c^10*d^2*e*x^6 + 1280*b*c^10*d^3*x^4 - 480*b*c^6*d^3 - 800*b*c^
4*d^2*e - 525*b*c^2*d*e^2 - 126*b*e^3)*arcsin(c*x) + (768*b*c^9*e^3*x^9 + 1
44*(25*b*c^9*d*e^2 + 6*b*c^7*e^3)*x^7 + 8*(800*b*c^9*d^2*e + 525*b*c^7*d*e^
2 + 126*b*c^5*e^3)*x^5 + 10*(480*b*c^9*d^3 + 800*b*c^7*d^2*e + 525*b*c^5*d*
e^2 + 126*b*c^3*e^3)*x^3 + 15*(480*b*c^7*d^3 + 800*b*c^5*d^2*e + 525*b*c^3*
d*e^2 + 126*b*c*e^3)*x)*sqrt(-c^2*x^2 + 1))/c^10
```

Sympy [A] (verification not implemented)

Time = 1.86 (sec) , antiderivative size = 597, normalized size of antiderivative = 1.57

$$\int x^3 (d+ex^2)^3 (a+b\arcsin(cx))\, dx$$

$$= \begin{cases} \frac{ad^3x^4}{4} + \frac{ad^2ex^6}{2} + \frac{3ade^2x^8}{8} + \frac{ae^3x^{10}}{10} + \frac{bd^3x^4 \operatorname{asin}(cx)}{4} + \frac{bd^2ex^6 \operatorname{asin}(cx)}{2} + \frac{3bde^2x^8 \operatorname{asin}(cx)}{8} + \frac{be^3x^{10} \operatorname{asin}(cx)}{10} + \frac{bd^3x^3\sqrt{-c^2x^2}}{16c} \\ a\left(\frac{d^3x^4}{4} + \frac{d^2ex^6}{2} + \frac{3de^2x^8}{8} + \frac{e^3x^{10}}{10}\right) \end{cases}$$

```
[In] integrate(x**3*(e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**4/4 + a*d**2*e*x**6/2 + 3*a*d*e**2*x**8/8 + a*e**3*x**
10/10 + b*d**3*x**4*asin(c*x)/4 + b*d**2*e*x**6*asin(c*x)/2 + 3*b*d*e**2*x*
*8*asin(c*x)/8 + b*e**3*x**10*asin(c*x)/10 + b*d**3*x**3*sqrt(-c**2*x**2 +
1)/(16*c) + b*d**2*e*x**5*sqrt(-c**2*x**2 + 1)/(12*c) + 3*b*d*e**2*x**7*sqr
t(-c**2*x**2 + 1)/(64*c) + b*e**3*x**9*sqrt(-c**2*x**2 + 1)/(100*c) + 3*b*d
**3*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 5*b*d**2*e*x**3*sqrt(-c**2*x**2 + 1)
/(48*c**3) + 7*b*d*e**2*x**5*sqrt(-c**2*x**2 + 1)/(128*c**3) + 9*b*e**3*x**
7*sqrt(-c**2*x**2 + 1)/(800*c**3) - 3*b*d**3*asin(c*x)/(32*c**4) + 5*b*d**2
*e*x*sqrt(-c**2*x**2 + 1)/(32*c**5) + 35*b*d*e**2*x**3*sqrt(-c**2*x**2 + 1)
/(512*c**5) + 21*b*e**3*x**5*sqrt(-c**2*x**2 + 1)/(1600*c**5) - 5*b*d**2*e*
asin(c*x)/(32*c**6) + 105*b*d*e**2*x*sqrt(-c**2*x**2 + 1)/(1024*c**7) + 21*
b*e**3*x**3*sqrt(-c**2*x**2 + 1)/(1280*c**7) - 105*b*d*e**2*asin(c*x)/(1024
*c**8) + 63*b*e**3*x*sqrt(-c**2*x**2 + 1)/(2560*c**9) - 63*b*e**3*asin(c*x)
/(2560*c**10), Ne(c, 0)), (a*(d**3*x**4/4 + d**2*e*x**6/2 + 3*d*e**2*x**8/8
 + e**3*x**10/10), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 425, normalized size of antiderivative = 1.12

$$\int x^3 (d+ex^2)^3 (a+b\arcsin(cx))\, dx = \frac{1}{10}\, ae^3x^{10} + \frac{3}{8}\, ade^2x^8 + \frac{1}{2}\, ad^2ex^6 + \frac{1}{4}\, ad^3x^4$$
$$+ \frac{1}{32}\left(8\, x^4 \arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bd^3$$
$$+ \frac{1}{96}\left(48\, x^6 \arcsin(cx) + \left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2} + \frac{10\sqrt{-c^2x^2+1}x^3}{c^4} + \frac{15\sqrt{-c^2x^2+1}x}{c^6} - \frac{15\arcsin(cx)}{c^7}\right)c\right)$$
$$+ \frac{1}{1024}\left(384\, x^8 \arcsin(cx) + \left(\frac{48\sqrt{-c^2x^2+1}x^7}{c^2} + \frac{56\sqrt{-c^2x^2+1}x^5}{c^4} + \frac{70\sqrt{-c^2x^2+1}x^3}{c^6} + \frac{105\sqrt{-c^2x^2}}{c^8}\right.\right.$$
$$+ \frac{1}{12800}\left(1280\, x^{10} \arcsin(cx) + \left(\frac{128\sqrt{-c^2x^2+1}x^9}{c^2} + \frac{144\sqrt{-c^2x^2+1}x^7}{c^4} + \frac{168\sqrt{-c^2x^2+1}x^5}{c^6} + \frac{210\sqrt{}}{}\right.\right.$$

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/10*a*e^3*x^10 + 3/8*a*d*e^2*x^8 + 1/2*a*d^2*e*x^6 + 1/4*a*d^3*x^4 + 1/32*
(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x
/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d^3 + 1/96*(48*x^6*arcsin(c*x) + (8*sqrt(-c^
2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*
x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*d^2*e + 1/1024*(384*x^8*arcsin(c*x) + (48*
sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(-c^2*x
^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c*x)/c^9)*c)*b*
d*e^2 + 1/12800*(1280*x^10*arcsin(c*x) + (128*sqrt(-c^2*x^2 + 1)*x^9/c^2 +
144*sqrt(-c^2*x^2 + 1)*x^7/c^4 + 168*sqrt(-c^2*x^2 + 1)*x^5/c^6 + 210*sqrt(
-c^2*x^2 + 1)*x^3/c^8 + 315*sqrt(-c^2*x^2 + 1)*x/c^10 - 315*arcsin(c*x)/c^1
1)*c)*b*e^3
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 807 vs. $2(354) = 708$.

Time = 0.31 (sec) , antiderivative size = 807, normalized size of antiderivative = 2.12

$$\int x^3\left(d+ex^2\right)^3\left(a+b\arcsin(cx)\right)dx = \frac{1}{10}ae^3x^{10}+\frac{3}{8}ade^2x^8+\frac{1}{2}ad^2ex^6+\frac{1}{4}ad^3x^4 - \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}bd^3x}{16\,c^3}+\frac{\left(c^2x^2-1\right)^2bd^3\arcsin\left(cx\right)}{4\,c^4} + \frac{5\sqrt{-c^2x^2+1}bd^3x}{32\,c^3}+\frac{\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}bd^2ex}{12\,c^5} + \frac{\left(c^2x^2-1\right)bd^3\arcsin\left(cx\right)}{2\,c^4} + \frac{\left(c^2x^2-1\right)^3bd^2e\arcsin\left(cx\right)}{2\,c^6} - \frac{13\left(-c^2x^2+1\right)^{\frac{3}{2}}bd^2ex}{48\,c^5} + \frac{3\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}bde^2x}{64\,c^7} + \frac{5\,bd^3\arcsin\left(cx\right)}{32\,c^4}+\frac{3\left(c^2x^2-1\right)^2bd^2e\arcsin\left(cx\right)}{2\,c^6} + \frac{3\left(c^2x^2-1\right)^4bde^2\arcsin\left(cx\right)}{8\,c^8} + \frac{11\sqrt{-c^2x^2+1}bd^2ex}{32\,c^5} + \frac{25\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}bde^2x}{128\,c^7} + \frac{\left(c^2x^2-1\right)^4\sqrt{-c^2x^2+1}be^3x}{100\,c^9} + \frac{3\left(c^2x^2-1\right)bd^2e\arcsin\left(cx\right)}{2\,c^6} + \frac{3\left(c^2x^2-1\right)^3bde^2\arcsin\left(cx\right)}{2\,c^8} + \frac{\left(c^2x^2-1\right)^5be^3\arcsin\left(cx\right)}{10\,c^{10}} - \frac{163\left(-c^2x^2+1\right)^{\frac{3}{2}}bde^2x}{512\,c^7} + \frac{41\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}be^3x}{800\,c^9} + \frac{11\,bd^2e\arcsin\left(cx\right)}{32\,c^6}+\frac{9\left(c^2x^2-1\right)^2bde^2\arcsin\left(cx\right)}{4\,c^8} + \frac{\left(c^2x^2-1\right)^4be^3\arcsin\left(cx\right)}{2\,c^{10}}+\frac{279\sqrt{-c^2x^2+1}bde^2x}{1024\,c^7} + \frac{171\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}be^3x}{1600\,c^9} + \frac{3\left(c^2x^2-1\right)bde^2\arcsin\left(cx\right)}{2\,c^8} + \frac{\left(c^2x^2-1\right)^3be^3\arcsin\left(cx\right)}{c^{10}} - \frac{149\left(-c^2x^2+1\right)^{\frac{3}{2}}be^3x}{} + \frac{279\,bde^2\arcsin\left(cx\right)}{}$$

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/10*a*e^3*x^10 + 3/8*a*d*e^2*x^8 + 1/2*a*d^2*e*x^6 + 1/4*a*d^3*x^4 - 1/16*
(-c^2*x^2 + 1)^(3/2)*b*d^3*x/c^3 + 1/4*(c^2*x^2 - 1)^2*b*d^3*arcsin(c*x)/c^
4 + 5/32*sqrt(-c^2*x^2 + 1)*b*d^3*x/c^3 + 1/12*(c^2*x^2 - 1)^2*sqrt(-c^2*x^
2 + 1)*b*d^2*e*x/c^5 + 1/2*(c^2*x^2 - 1)*b*d^3*arcsin(c*x)/c^4 + 1/2*(c^2*x
^2 - 1)^3*b*d^2*e*arcsin(c*x)/c^6 - 13/48*(-c^2*x^2 + 1)^(3/2)*b*d^2*e*x/c^
5 + 3/64*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d*e^2*x/c^7 + 5/32*b*d^3*arcs
in(c*x)/c^4 + 3/2*(c^2*x^2 - 1)^2*b*d^2*e*arcsin(c*x)/c^6 + 3/8*(c^2*x^2 -
1)^4*b*d*e^2*arcsin(c*x)/c^8 + 11/32*sqrt(-c^2*x^2 + 1)*b*d^2*e*x/c^5 + 25/
128*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e^2*x/c^7 + 1/100*(c^2*x^2 - 1)^
4*sqrt(-c^2*x^2 + 1)*b*e^3*x/c^9 + 3/2*(c^2*x^2 - 1)*b*d^2*e*arcsin(c*x)/c^
6 + 3/2*(c^2*x^2 - 1)^3*b*d*e^2*arcsin(c*x)/c^8 + 1/10*(c^2*x^2 - 1)^5*b*e^
3*arcsin(c*x)/c^10 - 163/512*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*x/c^7 + 41/800*(c
^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^3*x/c^9 + 11/32*b*d^2*e*arcsin(c*x)/c^
6 + 9/4*(c^2*x^2 - 1)^2*b*d*e^2*arcsin(c*x)/c^8 + 1/2*(c^2*x^2 - 1)^4*b*e^3
*arcsin(c*x)/c^10 + 279/1024*sqrt(-c^2*x^2 + 1)*b*d*e^2*x/c^7 + 171/1600*(c
^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^3*x/c^9 + 3/2*(c^2*x^2 - 1)*b*d*e^2*ar
csin(c*x)/c^8 + (c^2*x^2 - 1)^3*b*e^3*arcsin(c*x)/c^10 - 149/1280*(-c^2*x^2
 + 1)^(3/2)*b*e^3*x/c^9 + 279/1024*b*d*e^2*arcsin(c*x)/c^8 + (c^2*x^2 - 1)^
2*b*e^3*arcsin(c*x)/c^10 + 193/2560*sqrt(-c^2*x^2 + 1)*b*e^3*x/c^9 + 1/2*(c
^2*x^2 - 1)*b*e^3*arcsin(c*x)/c^10 + 193/2560*b*e^3*arcsin(c*x)/c^10
```

Mupad [F(-1)]

Timed out.

$$\int x^3(d+ex^2)^3(a+b\arcsin(cx))\,dx=\int x^3\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^3\,dx$$

```
[In] int(x^3*(a + b*asin(c*x))*(d + e*x^2)^3,x)
```

```
[Out] int(x^3*(a + b*asin(c*x))*(d + e*x^2)^3, x)
```

3.616 $\int x^2(d+ex^2)^3(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 287

$$\int x^2(d+ex^2)^3(a+b\arcsin(cx))\,dx = \frac{b(105c^6d^3+189c^4d^2e+135c^2de^2+35e^3)\sqrt{1-c^2x^2}}{315c^9} - \frac{b(105c^6d^3+378c^4d^2e+405c^2de^2+140e^3)(1-c^2x^2)^{3/2}}{945c^9} + \frac{be(63c^4d^2+135c^2de+70e^2)(1-c^2x^2)^{5/2}}{525c^9} - \frac{be^2(27c^2d+28e)(1-c^2x^2)^{7/2}}{441c^9} + \frac{be^3(1-c^2x^2)^{9/2}}{81c^9} + \frac{1}{3}d^3x^3(a+b\arcsin(cx)) + \frac{3}{5}d^2ex^5(a+b\arcsin(cx)) + \frac{3}{7}de^2x^7(a+b\arcsin(cx)) + \frac{1}{9}e^3x^9(a+b\arcsin(cx))$$

```
[Out] -1/945*b*(105*c^6*d^3+378*c^4*d^2*e+405*c^2*d*e^2+140*e^3)*(-c^2*x^2+1)^(3/
2)/c^9+1/525*b*e*(63*c^4*d^2+135*c^2*d*e+70*e^2)*(-c^2*x^2+1)^(5/2)/c^9-1/4
41*b*e^2*(27*c^2*d+28*e)*(-c^2*x^2+1)^(7/2)/c^9+1/81*b*e^3*(-c^2*x^2+1)^(9/
2)/c^9+1/3*d^3*x^3*(a+b*arcsin(c*x))+3/5*d^2*e*x^5*(a+b*arcsin(c*x))+3/7*d*
e^2*x^7*(a+b*arcsin(c*x))+1/9*e^3*x^9*(a+b*arcsin(c*x))+1/315*b*(105*c^6*d^
3+189*c^4*d^2*e+135*c^2*d*e^2+35*e^3)*(-c^2*x^2+1)^(1/2)/c^9
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {276, 4815, 12, 1813, 1634}

$$\begin{aligned}
&\int x^2\left(d+ex^2\right)^3(a+b\arcsin(cx))\,dx\\
&=\frac{1}{3}d^3x^3(a+b\arcsin(cx))+\frac{3}{5}d^2ex^5(a+b\arcsin(cx))+\frac{3}{7}de^2x^7(a+b\arcsin(cx))\\
&+\frac{1}{9}e^3x^9(a+b\arcsin(cx))-\frac{be^2(1-c^2x^2)^{7/2}\left(27c^2d+28e\right)}{441c^9}\\
&+\frac{be^3(1-c^2x^2)^{9/2}}{81c^9}+\frac{be(1-c^2x^2)^{5/2}\left(63c^4d^2+135c^2de+70e^2\right)}{525c^9}\\
&-\frac{b(1-c^2x^2)^{3/2}\left(105c^6d^3+378c^4d^2e+405c^2de^2+140e^3\right)}{945c^9}\\
&+\frac{b\sqrt{1-c^2x^2}(105c^6d^3+189c^4d^2e+135c^2de^2+35e^3)}{315c^9}
\end{aligned}$$

```
[In] Int[x^2*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(105*c^6*d^3 + 189*c^4*d^2*e + 135*c^2*d*e^2 + 35*e^3)*Sqrt[1 - c^2*x^2]
)/(315*c^9) - (b*(105*c^6*d^3 + 378*c^4*d^2*e + 405*c^2*d*e^2 + 140*e^3)*(1
 - c^2*x^2)^(3/2))/(945*c^9) + (b*e*(63*c^4*d^2 + 135*c^2*d*e + 70*e^2)*(1
- c^2*x^2)^(5/2))/(525*c^9) - (b*e^2*(27*c^2*d + 28*e)*(1 - c^2*x^2)^(7/2))
/(441*c^9) + (b*e^3*(1 - c^2*x^2)^(9/2))/(81*c^9) + (d^3*x^3*(a + b*ArcSin[
c*x]))/3 + (3*d^2*e*x^5*(a + b*ArcSin[c*x]))/5 + (3*d*e^2*x^7*(a + b*ArcSin
[c*x]))/7 + (e^3*x^9*(a + b*ArcSin[c*x]))/9
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{1}{3}d^3x^3(a+b\arcsin(cx))+\frac{3}{5}d^2ex^5(a+b\arcsin(cx))+\frac{3}{7}de^2x^7(a+b\arcsin(cx)) \\
&\quad+\frac{1}{9}e^3x^9(a+b\arcsin(cx))-(bc)\int\frac{x^3(105d^3+189d^2ex^2+135de^2x^4+35e^3x^6)}{315\sqrt{1-c^2x^2}}\,dx \\
&= \frac{1}{3}d^3x^3(a+b\arcsin(cx))+\frac{3}{5}d^2ex^5(a+b\arcsin(cx))+\frac{3}{7}de^2x^7(a+b\arcsin(cx)) \\
&\quad+\frac{1}{9}e^3x^9(a+b\arcsin(cx))-\frac{1}{315}(bc)\int\frac{x^3(105d^3+189d^2ex^2+135de^2x^4+35e^3x^6)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{1}{3}d^3x^3(a+b\arcsin(cx))+\frac{3}{5}d^2ex^5(a+b\arcsin(cx)) \\
&\quad+\frac{3}{7}de^2x^7(a+b\arcsin(cx))+\frac{1}{9}e^3x^9(a+b\arcsin(cx)) \\
&\quad-\frac{1}{630}(bc)\text{Subst}\left(\int\frac{x(105d^3+189d^2ex+135de^2x^2+35e^3x^3)}{\sqrt{1-c^2x}}\,dx,x,x^2\right) \\
&= \frac{1}{3}d^3x^3(a+b\arcsin(cx))+\frac{3}{5}d^2ex^5(a+b\arcsin(cx)) \\
&\quad+\frac{3}{7}de^2x^7(a+b\arcsin(cx))+\frac{1}{9}e^3x^9(a+b\arcsin(cx)) \\
&\quad-\frac{1}{630}(bc)\text{Subst}\left(\int\left(\frac{105c^6d^3+189c^4d^2e+135c^2de^2+35e^3}{c^8\sqrt{1-c^2x}}\right.\right. \\
&\qquad+\frac{(-105c^6d^3-378c^4d^2e-405c^2de^2-140e^3)\sqrt{1-c^2x}}{c^8} \\
&\qquad+\frac{3e(63c^4d^2+135c^2de+70e^2)(1-c^2x)^{3/2}}{c^8}-\frac{5e^2(27c^2d+28e)(1-c^2x)^{5/2}}{c^8} \\
&\qquad\left.\left.+\frac{35e^3(1-c^2x)^{7/2}}{c^8}\right)\,dx,x,x^2\right)
\end{aligned}$$

$$= \frac{b(105c^6d^3+189c^4d^2e+135c^2de^2+35e^3)\sqrt{1-c^2x^2}}{315c^9} - \frac{b(105c^6d^3+378c^4d^2e+405c^2de^2+140e^3)(1-c^2x^2)^{3/2}}{945c^9} + \frac{be(63c^4d^2+135c^2de+70e^2)(1-c^2x^2)^{5/2}}{525c^9} - \frac{be^2(27c^2d+28e)(1-c^2x^2)^{7/2}}{441c^9} + \frac{be^3(1-c^2x^2)^{9/2}}{81c^9} + \frac{1}{3}d^3x^3(a+b\arcsin(cx)) + \frac{3}{5}d^2ex^5(a+b\arcsin(cx)) + \frac{3}{7}de^2x^7(a+b\arcsin(cx)) + \frac{1}{9}e^3x^9(a+b\arcsin$$

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 231, normalized size of antiderivative = 0.80

$$\int x^2(d+ex^2)^3(a+b\arcsin(cx))\,dx = \frac{315ax^3(105d^3+189d^2ex^2+135de^2x^4+35e^3x^6) + \frac{b\sqrt{1-c^2x^2}(4480e^3+80c^2e^2(243d+28ex^2)+24c^4e(1323d^2+405dex^2+70e^2}{}}{}$$

```
[In] Integrate[x^2*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (315*a*x^3*(105*d^3 + 189*d^2*e*x^2 + 135*d*e^2*x^4 + 35*e^3*x^6) + (b*Sqrt
[1 - c^2*x^2]*(4480*e^3 + 80*c^2*e^2*(243*d + 28*e*x^2) + 24*c^4*e*(1323*d^
2 + 405*d*e*x^2 + 70*e^2*x^4) + 2*c^6*(11025*d^3 + 7938*d^2*e*x^2 + 3645*d*
e^2*x^4 + 700*e^3*x^6) + c^8*(11025*d^3*x^2 + 11907*d^2*e*x^4 + 6075*d*e^2*
x^6 + 1225*e^3*x^8)))/c^9 + 315*b*x^3*(105*d^3 + 189*d^2*e*x^2 + 135*d*e^2*
x^4 + 35*e^3*x^6)*ArcSin[c*x])/99225
```

Maple [A] (verified)

Time = 0.27 (sec) , antiderivative size = 404, normalized size of antiderivative = 1.41

method	result
parts	$a\left(\frac{1}{9}e^3x^9+\frac{3}{7}d\,e^2x^7+\frac{3}{5}d^2e\,x^5+\frac{1}{3}d^3x^3\right)+\frac{b\left(\frac{c^3\arcsin(cx)e^3x^9}{9}+\frac{3c^3\arcsin(cx)d\,e^2x^7}{7}+\frac{3c^3\arcsin(cx)d^2e\,x^5}{5}+\right.}{}$
derivativedivides	$\frac{a\left(\frac{1}{3}d^3c^9x^3+\frac{3}{5}d^2c^9e\,x^5+\frac{3}{7}d\,c^9e^2x^7+\frac{1}{9}e^3c^9x^9\right)}{c^6}+\frac{b\left(\frac{\arcsin(cx)d^3c^9x^3}{3}+\frac{3\arcsin(cx)d^2c^9e\,x^5}{5}+\frac{3\arcsin(cx)d\,c^9e^2x^7}{7}+\frac{\arcsin(cx)e^3}{9}\right.}{}$
default	$\frac{a\left(\frac{1}{3}d^3c^9x^3+\frac{3}{5}d^2c^9e\,x^5+\frac{3}{7}d\,c^9e^2x^7+\frac{1}{9}e^3c^9x^9\right)}{c^6}+\frac{b\left(\frac{\arcsin(cx)d^3c^9x^3}{3}+\frac{3\arcsin(cx)d^2c^9e\,x^5}{5}+\frac{3\arcsin(cx)d\,c^9e^2x^7}{7}+\frac{\arcsin(cx)e^3}{9}\right.}{}$

```
[In] int(x^2*(e*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/9*e^3*x^9+3/7*d*e^2*x^7+3/5*d^2*e*x^5+1/3*d^3*x^3)+b/c^3*(1/9*c^3*arcs
in(c*x)*e^3*x^9+3/7*c^3*arcsin(c*x)*d*e^2*x^7+3/5*c^3*arcsin(c*x)*d^2*e*x^5
+1/3*arcsin(c*x)*c^3*x^3*d^3-1/315/c^6*(35*e^3*(-1/9*c^8*x^8*(-c^2*x^2+1)^(
1/2)-8/63*c^6*x^6*(-c^2*x^2+1)^(1/2)-16/105*c^4*x^4*(-c^2*x^2+1)^(1/2)-64/3
15*c^2*x^2*(-c^2*x^2+1)^(1/2)-128/315*(-c^2*x^2+1)^(1/2))+105*d^3*c^6*(-1/3
*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+135*d*c^2*e^2*(-1/7*c^6
*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*
x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2))+189*d^2*c^4*e*(-1/5*c^4*x^4*(-c^2*x^
2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 277, normalized size of antiderivative = 0.97

$$\int x^2\left(d+ex^2\right)^3\left(a+b\arcsin(cx)\right)dx$$
$$=\frac{11025\,ac^9e^3x^9+42525\,ac^9de^2x^7+59535\,ac^9d^2ex^5+33075\,ac^9d^3x^3+315\left(35\,bc^9e^3x^9+135\,bc^9de^2x^7+189\right.}{}$$

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/99225*(11025*a*c^9*e^3*x^9 + 42525*a*c^9*d*e^2*x^7 + 59535*a*c^9*d^2*e*x^
5 + 33075*a*c^9*d^3*x^3 + 315*(35*b*c^9*e^3*x^9 + 135*b*c^9*d*e^2*x^7 + 189
*b*c^9*d^2*e*x^5 + 105*b*c^9*d^3*x^3)*arcsin(c*x) + (1225*b*c^8*e^3*x^8 + 2
2050*b*c^6*d^3 + 31752*b*c^4*d^2*e + 25*(243*b*c^8*d*e^2 + 56*b*c^6*e^3)*x^
6 + 19440*b*c^2*d*e^2 + 3*(3969*b*c^8*d^2*e + 2430*b*c^6*d*e^2 + 560*b*c^4*
e^3)*x^4 + 4480*b*e^3 + (11025*b*c^8*d^3 + 15876*b*c^6*d^2*e + 9720*b*c^4*d
*e^2 + 2240*b*c^2*e^3)*x^2)*sqrt(-c^2*x^2 + 1))/c^9
```

Sympy [A] (verification not implemented)

Time = 1.23 (sec) , antiderivative size = 525, normalized size of antiderivative = 1.83

$$\int x^2\left(d+ex^2\right)^3\left(a+b\arcsin(cx)\right)dx$$
$$=\begin{cases}\frac{ad^3x^3}{3}+\frac{3ad^2ex^5}{5}+\frac{3ade^2x^7}{7}+\frac{ae^3x^9}{9}+\frac{bd^3x^3\operatorname{asin}(cx)}{3}+\frac{3bd^2ex^5\operatorname{asin}(cx)}{5}+\frac{3bde^2x^7\operatorname{asin}(cx)}{7}+\frac{be^3x^9\operatorname{asin}(cx)}{9}+\frac{bd^3x^2\sqrt{-c^2x^2}}{9c} \\ a\left(\frac{d^3x^3}{3}+\frac{3d^2ex^5}{5}+\frac{3de^2x^7}{7}+\frac{e^3x^9}{9}\right)\end{cases}$$

```
[In] integrate(x**2*(e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**3/3 + 3*a*d**2*e*x**5/5 + 3*a*d*e**2*x**7/7 + a*e**3*x
**9/9 + b*d**3*x**3*asin(c*x)/3 + 3*b*d**2*e*x**5*asin(c*x)/5 + 3*b*d*e**2*
x**7*asin(c*x)/7 + b*e**3*x**9*asin(c*x)/9 + b*d**3*x**2*sqrt(-c**2*x**2 +
1)/(9*c) + 3*b*d**2*e*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + 3*b*d*e**2*x**6*sq
rt(-c**2*x**2 + 1)/(49*c) + b*e**3*x**8*sqrt(-c**2*x**2 + 1)/(81*c) + 2*b*d
**3*sqrt(-c**2*x**2 + 1)/(9*c**3) + 4*b*d**2*e*x**2*sqrt(-c**2*x**2 + 1)/(2
5*c**3) + 18*b*d*e**2*x**4*sqrt(-c**2*x**2 + 1)/(245*c**3) + 8*b*e**3*x**6*
sqrt(-c**2*x**2 + 1)/(567*c**3) + 8*b*d**2*e*sqrt(-c**2*x**2 + 1)/(25*c**5)
 + 24*b*d*e**2*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e**3*x**4*sqrt(-
c**2*x**2 + 1)/(945*c**5) + 48*b*d*e**2*sqrt(-c**2*x**2 + 1)/(245*c**7) + 6
4*b*e**3*x**2*sqrt(-c**2*x**2 + 1)/(2835*c**7) + 128*b*e**3*sqrt(-c**2*x**2
 + 1)/(2835*c**9), Ne(c, 0)), (a*(d**3*x**3/3 + 3*d**2*e*x**5/5 + 3*d*e**2*
x**7/7 + e**3*x**9/9), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 384, normalized size of antiderivative = 1.34

$$\begin{aligned}\int x^2(d+ex^2)^3(a+b\arcsin(cx))\,dx &= \frac{1}{9}\,ae^3x^9 + \frac{3}{7}\,ade^2x^7 + \frac{3}{5}\,ad^2ex^5 \\ &+ \frac{1}{3}\,ad^3x^3 + \frac{1}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^3 \\ &+ \frac{1}{25}\left(15\,x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd^2e \\ &+ \frac{3}{245}\left(35\,x^7\arcsin(cx) + \left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2} + \frac{6\sqrt{-c^2x^2+1}x^4}{c^4} + \frac{8\sqrt{-c^2x^2+1}x^2}{c^6} + \frac{16\sqrt{-c^2x^2+1}}{c^8}\right)\right. \\ &+ \frac{1}{2835}\left(315\,x^9\arcsin(cx) + \left(\frac{35\sqrt{-c^2x^2+1}x^8}{c^2} + \frac{40\sqrt{-c^2x^2+1}x^6}{c^4} + \frac{48\sqrt{-c^2x^2+1}x^4}{c^6} + \frac{64\sqrt{-c^2x^2}}{c^8}\right.\right.\end{aligned}$$

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/9*a*e^3*x^9 + 3/7*a*d*e^2*x^7 + 3/5*a*d^2*e*x^5 + 1/3*a*d^3*x^3 + 1/9*(3*
x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)
)*b*d^3 + 1/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt
(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d^2*e + 3/245*(35*x
^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c
^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*d*e^2 +
 1/2835*(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*sqrt(-c^
2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x^2 + 1)*
x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*b*e^3
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 711 vs. 2(259) = 518.

Time = 0.30 (sec) , antiderivative size = 711, normalized size of antiderivative = 2.48

$$\int x^2(d+ex^2)^3(a+b\arcsin(cx))\,dx = \frac{1}{9}ae^3x^9+\frac{3}{7}ade^2x^7+\frac{3}{5}ad^2ex^5+\frac{1}{3}ad^3x^3+\frac{(c^2x^2-1)bd^3x\arcsin(cx)}{3c^2}+\frac{bd^3x\arcsin(cx)}{3c^2}+\frac{3(c^2x^2-1)^2bd^2ex\arcsin(cx)}{5c^4}+\frac{6(c^2x^2-1)bd^2ex\arcsin(cx)}{5c^4}+\frac{3(c^2x^2-1)^3bde^2x\arcsin(cx)}{7c^6}-\frac{(-c^2x^2+1)^{\frac{3}{2}}bd^3}{9c^3}+\frac{3bd^2ex\arcsin(cx)}{5c^4}+\frac{9(c^2x^2-1)^2bde^2x\arcsin(cx)}{7c^6}+\frac{(c^2x^2-1)^4be^3x\arcsin(cx)}{9c^8}+\frac{\sqrt{-c^2x^2+1}bd^3}{3c^3}+\frac{3(c^2x^2-1)^2\sqrt{-c^2x^2+1}bd^2e}{25c^5}+\frac{9(c^2x^2-1)bde^2x\arcsin(cx)}{7c^6}+\frac{4(c^2x^2-1)^3be^3x\arcsin(cx)}{9c^8}-\frac{2(-c^2x^2+1)^{\frac{3}{2}}bd^2e}{5c^5}+\frac{3(c^2x^2-1)^3\sqrt{-c^2x^2+1}bde^2}{49c^7}+\frac{3bde^2x\arcsin(cx)}{7c^6}+\frac{2(c^2x^2-1)^2be^3x\arcsin(cx)}{3c^8}+\frac{3\sqrt{-c^2x^2+1}bd^2e}{5c^5}+\frac{9(c^2x^2-1)^2\sqrt{-c^2x^2+1}bde^2}{35c^7}+\frac{(c^2x^2-1)^4\sqrt{-c^2x^2+1}be^3}{81c^9}+\frac{4(c^2x^2-1)be^3x\arcsin(cx)}{9c^8}-\frac{3(-c^2x^2+1)^{\frac{3}{2}}bde^2}{7c^7}+\frac{4(c^2x^2-1)^3\sqrt{-c^2x^2+1}be^3}{63c^9}+\frac{be^3x\arcsin(cx)}{9c^8}+\frac{3\sqrt{-c^2x^2+1}bde^2}{7c^7}+\frac{2(c^2x^2-1)^2\sqrt{-c^2x^2+1}be^3}{15c^9}-\frac{4(-c^2x^2+1)^{\frac{3}{2}}be^3}{27c^9}+\frac{\sqrt{-c^2x^2+1}be^3}{9c^9}$$

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/9*a*e^3*x^9 + 3/7*a*d*e^2*x^7 + 3/5*a*d^2*e*x^5 + 1/3*a*d^3*x^3 + 1/3*(c^
2*x^2 - 1)*b*d^3*x*arcsin(c*x)/c^2 + 1/3*b*d^3*x*arcsin(c*x)/c^2 + 3/5*(c^2
*x^2 - 1)^2*b*d^2*e*x*arcsin(c*x)/c^4 + 6/5*(c^2*x^2 - 1)*b*d^2*e*x*arcsin(
c*x)/c^4 + 3/7*(c^2*x^2 - 1)^3*b*d*e^2*x*arcsin(c*x)/c^6 - 1/9*(-c^2*x^2 +
1)^(3/2)*b*d^3/c^3 + 3/5*b*d^2*e*x*arcsin(c*x)/c^4 + 9/7*(c^2*x^2 - 1)^2*b*
d*e^2*x*arcsin(c*x)/c^6 + 1/9*(c^2*x^2 - 1)^4*b*e^3*x*arcsin(c*x)/c^8 + 1/3
*sqrt(-c^2*x^2 + 1)*b*d^3/c^3 + 3/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d
^2*e/c^5 + 9/7*(c^2*x^2 - 1)*b*d*e^2*x*arcsin(c*x)/c^6 + 4/9*(c^2*x^2 - 1)^
3*b*e^3*x*arcsin(c*x)/c^8 - 2/5*(-c^2*x^2 + 1)^(3/2)*b*d^2*e/c^5 + 3/49*(c^
2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^7 + 3/7*b*d*e^2*x*arcsin(c*x)/c^6
 + 2/3*(c^2*x^2 - 1)^2*b*e^3*x*arcsin(c*x)/c^8 + 3/5*sqrt(-c^2*x^2 + 1)*b*d
^2*e/c^5 + 9/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^7 + 1/81*(c^2*
x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*e^3/c^9 + 4/9*(c^2*x^2 - 1)*b*e^3*x*arcsin(
c*x)/c^8 - 3/7*(-c^2*x^2 + 1)^(3/2)*b*d*e^2/c^7 + 4/63*(c^2*x^2 - 1)^3*sqrt
(-c^2*x^2 + 1)*b*e^3/c^9 + 1/9*b*e^3*x*arcsin(c*x)/c^8 + 3/7*sqrt(-c^2*x^2
+ 1)*b*d*e^2/c^7 + 2/15*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^3/c^9 - 4/27
*(-c^2*x^2 + 1)^(3/2)*b*e^3/c^9 + 1/9*sqrt(-c^2*x^2 + 1)*b*e^3/c^9
```

Mupad [F(-1)]

Timed out.

$$\int x^2 (d+ex^2)^3 (a+b\arcsin(cx))\,dx = \int x^2\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^3\,dx$$

```
[In] int(x^2*(a + b*asin(c*x))*(d + e*x^2)^3,x)
```

```
[Out] int(x^2*(a + b*asin(c*x))*(d + e*x^2)^3, x)
```

3.617 $\int x(d+ex^2)^3 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 258

$$\begin{aligned}
&\int x(d+ex^2)^3 (a+b\arcsin(cx))\,dx \\
&= \frac{5b(2c^2d+e)\left(40c^4d^2+40c^2de+21e^2\right)x\sqrt{1-c^2x^2}}{3072c^7} \\
&\quad + \frac{b(104c^4d^2+104c^2de+35e^2)\,x\sqrt{1-c^2x^2}(d+ex^2)}{1536c^5} \\
&\quad + \frac{7b(2c^2d+e)\,x\sqrt{1-c^2x^2}(d+ex^2)^2}{384c^3} + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^3}{64c} \\
&\quad - \frac{b(128c^8d^4+256c^6d^3e+288c^4d^2e^2+160c^2de^3+35e^4)\arcsin(cx)}{1024c^8e} \\
&\quad + \frac{(d+ex^2)^4 (a+b\arcsin(cx))}{8e}
\end{aligned}$$

```
[Out] -1/1024*b*(128*c^8*d^4+256*c^6*d^3*e+288*c^4*d^2*e^2+160*c^2*d*e^3+35*e^4)*
arcsin(c*x)/c^8/e+1/8*(e*x^2+d)^4*(a+b*arcsin(c*x))/e+5/3072*b*(2*c^2*d+e)*
(40*c^4*d^2+40*c^2*d*e+21*e^2)*x*(-c^2*x^2+1)^(1/2)/c^7+1/1536*b*(104*c^4*d
^2+104*c^2*d*e+35*e^2)*x*(e*x^2+d)*(-c^2*x^2+1)^(1/2)/c^5+7/384*b*(2*c^2*d+
e)*x*(e*x^2+d)^2*(-c^2*x^2+1)^(1/2)/c^3+1/64*b*x*(e*x^2+d)^3*(-c^2*x^2+1)^(
1/2)/c
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 258, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {4813, 427, 542, 396, 222}

$$\begin{aligned}&\int x(d+ex^2)^3(a+b\arcsin(cx))\,dx\\&=\frac{(d+ex^2)^4(a+b\arcsin(cx))}{8e}\\&\quad-\frac{b\arcsin(cx)\,(128c^8d^4+256c^6d^3e+288c^4d^2e^2+160c^2de^3+35e^4)}{1024c^8e}\\&\quad+\frac{bx\sqrt{1-c^2x^2}(d+ex^2)^3}{64c}+\frac{7bx\sqrt{1-c^2x^2}(2c^2d+e)\,(d+ex^2)^2}{384c^3}\\&\quad+\frac{5bx\sqrt{1-c^2x^2}(2c^2d+e)\,(40c^4d^2+40c^2de+21e^2)}{3072c^7}\\&\quad+\frac{bx\sqrt{1-c^2x^2}(104c^4d^2+104c^2de+35e^2)\,(d+ex^2)}{1536c^5}\end{aligned}$$

```
[In] Int[x*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (5*b*(2*c^2*d + e)*(40*c^4*d^2 + 40*c^2*d*e + 21*e^2)*x*Sqrt[1 - c^2*x^2])/
(3072*c^7) + (b*(104*c^4*d^2 + 104*c^2*d*e + 35*e^2)*x*Sqrt[1 - c^2*x^2]*(d
 + e*x^2))/(1536*c^5) + (7*b*(2*c^2*d + e)*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^
2)/(384*c^3) + (b*x*Sqrt[1 - c^2*x^2]*(d + e*x^2)^3)/(64*c) - (b*(128*c^8*d
^4 + 256*c^6*d^3*e + 288*c^4*d^2*e^2 + 160*c^2*d*e^3 + 35*e^4)*ArcSin[c*x])
/(1024*c^8*e) + ((d + e*x^2)^4*(a + b*ArcSin[c*x]))/(8*e)
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 396

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[d*x*((a + b*x^n)^(p + 1)/(b*(n*(p + 1) + 1))), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 427

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[d*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^(q - 1)/(b*(n*(p + q) + 1))),
x] + Dist[1/(b*(n*(p + q) + 1)), Int[(a + b*x^n)^p*(c + d*x^n)^(q - 2)*Simp
[c*(b*c*(n*(p + q) + 1) - a*d) + d*(b*c*(n*(p + 2*q - 1) + 1) - a*d*(n*(q -
 1) + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d,
```

```
0] && GtQ[q, 1] && NeQ[n*(p + q) + 1, 0] && !IGtQ[p, 1] && IntBinomialQ[a
, b, c, d, n, p, q, x]
```

Rule 542

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[f*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^q/(
b*(n*(p + q + 1) + 1))), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{(d+ex^2)^4(a+b\arcsin(cx))}{8e} - \frac{(bc)\int \frac{(d+ex^2)^4}{\sqrt{1-c^2x^2}}\,dx}{8e} \\
&= \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^3}{64c} + \frac{(d+ex^2)^4(a+b\arcsin(cx))}{8e} \\
&\quad + \frac{b\int \frac{(d+ex^2)^2(-d(8c^2d+e)-7e(2c^2d+e)x^2)}{\sqrt{1-c^2x^2}}\,dx}{64ce} \\
&= \frac{7b(2c^2d+e)\,x\sqrt{1-c^2x^2}(d+ex^2)^2}{384c^3} \\
&\quad + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^3}{64c} + \frac{(d+ex^2)^4(a+b\arcsin(cx))}{8e} \\
&\quad - \frac{b\int \frac{(d+ex^2)(d(48c^4d^2+20c^2de+7e^2)+e(104c^4d^2+104c^2de+35e^2)x^2)}{\sqrt{1-c^2x^2}}\,dx}{384c^3e} \\
&= \frac{b(104c^4d^2+104c^2de+35e^2)\,x\sqrt{1-c^2x^2}(d+ex^2)}{1536c^5} \\
&\quad + \frac{7b(2c^2d+e)\,x\sqrt{1-c^2x^2}(d+ex^2)^2}{384c^3} \\
&\quad + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^3}{64c} + \frac{(d+ex^2)^4(a+b\arcsin(cx))}{8e} \\
&\quad + \frac{b\int \frac{-d(192c^6d^3+184c^4d^2e+132c^2de^2+35e^3)-5e(2c^2d+e)(40c^4d^2+40c^2de+21e^2)x^2}{\sqrt{1-c^2x^2}}\,dx}{1536c^5e}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{5b(2c^2d+e)\,(40c^4d^2+40c^2de+21e^2)\,x\sqrt{1-c^2x^2}}{3072c^7} \\
&\quad + \frac{b(104c^4d^2+104c^2de+35e^2)\,x\sqrt{1-c^2x^2}(d+ex^2)}{1536c^5} \\
&\quad + \frac{7b(2c^2d+e)\,x\sqrt{1-c^2x^2}(d+ex^2)^2}{384c^3} \\
&\quad + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^3}{64c} + \frac{(d+ex^2)^4\,(a+b\arcsin(cx))}{8e} \\
&\quad - \frac{(b(128c^8d^4+256c^6d^3e+288c^4d^2e^2+160c^2de^3+35e^4))\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{1024c^7e}
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{5b(2c^2d+e)\,(40c^4d^2+40c^2de+21e^2)\,x\sqrt{1-c^2x^2}}{3072c^7} \\
&\quad + \frac{b(104c^4d^2+104c^2de+35e^2)\,x\sqrt{1-c^2x^2}(d+ex^2)}{1536c^5} \\
&\quad + \frac{7b(2c^2d+e)\,x\sqrt{1-c^2x^2}(d+ex^2)^2}{384c^3} + \frac{bx\sqrt{1-c^2x^2}(d+ex^2)^3}{64c} \\
&\quad - \frac{b(128c^8d^4+256c^6d^3e+288c^4d^2e^2+160c^2de^3+35e^4)\arcsin(cx)}{1024c^8e} \\
&\quad + \frac{(d+ex^2)^4\,(a+b\arcsin(cx))}{8e}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 232, normalized size of antiderivative = 0.90

$$
\int x\left(d+ex^2\right)^3(a+b\arcsin(cx))\,dx
$$

$$
= \frac{cx\left(384ac^7x(4d^3+6d^2ex^2+4de^2x^4+e^3x^6)+b\sqrt{1-c^2x^2}(105e^3+10c^2e^2(48d+7ex^2)+8c^4e(108d^2+40
\end{aligned}
$$

```
[In] Integrate[x*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (c*x*(384*a*c^7*x*(4*d^3 + 6*d^2*e*x^2 + 4*d*e^2*x^4 + e^3*x^6) + b*Sqrt[1
- c^2*x^2]*(105*e^3 + 10*c^2*e^2*(48*d + 7*e*x^2) + 8*c^4*e*(108*d^2 + 40*d
*e*x^2 + 7*e^2*x^4) + 16*c^6*(48*d^3 + 36*d^2*e*x^2 + 16*d*e^2*x^4 + 3*e^3*
x^6))) + 3*b*(-256*c^6*d^3 - 288*c^4*d^2*e - 160*c^2*d*e^2 - 35*e^3 + 128*c
^8*(4*d^3*x^2 + 6*d^2*e*x^4 + 4*d*e^2*x^6 + e^3*x^8))*ArcSin[c*x])/(3072*c^
8)
```

Maple [A] (verified)

Time = 0.46 (sec) , antiderivative size = 365, normalized size of antiderivative = 1.41

method	result
parts	$\frac{a\left(e\,x^2+d\right)^4}{8e}+\frac{b\left(\frac{c^2e^3\arcsin(cx)x^8}{8}+\frac{c^2e^2\arcsin(cx)x^6d}{2}+\frac{3c^2e\arcsin(cx)x^4d^2}{4}+\frac{\arcsin(cx)c^2x^2d^3}{2}+\frac{c^2\arcsin(cx)d^4}{8e}-\frac{c^8d^4\arcsin}{}\right.}{}$
derivativedivides	$\frac{a\left(c^2e\,x^2+c^2d\right)^4}{8c^6e}+\frac{b\left(\frac{\arcsin(cx)c^8d^4}{8e}+\frac{\arcsin(cx)c^8d^3x^2}{2}+\frac{3e\arcsin(cx)c^8d^2x^4}{4}+\frac{e^2\arcsin(cx)c^8d\,x^6}{2}+\frac{e^3\arcsin(cx)c^8x^8}{8}-\frac{c^8d^4\arcsin}{}\right.}{}$
default	$\frac{a\left(c^2e\,x^2+c^2d\right)^4}{8c^6e}+\frac{b\left(\frac{\arcsin(cx)c^8d^4}{8e}+\frac{\arcsin(cx)c^8d^3x^2}{2}+\frac{3e\arcsin(cx)c^8d^2x^4}{4}+\frac{e^2\arcsin(cx)c^8d\,x^6}{2}+\frac{e^3\arcsin(cx)c^8x^8}{8}-\frac{c^8d^4\arcsin}{}\right.}{}$

```
[In] int(x*(e*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/8*a*(e*x^2+d)^4/e+b/c^2*(1/8*c^2*e^3*arcsin(c*x)*x^8+1/2*c^2*e^2*arcsin(c
*x)*x^6*d+3/4*c^2*e*arcsin(c*x)*x^4*d^2+1/2*arcsin(c*x)*c^2*x^2*d^3+1/8*c^2
/e*arcsin(c*x)*d^4-1/8/c^6/e*(c^8*d^4*arcsin(c*x)+e^4*(-1/8*c^7*x^7*(-c^2*x
^2+1)^(1/2)-7/48*c^5*x^5*(-c^2*x^2+1)^(1/2)-35/192*c^3*x^3*(-c^2*x^2+1)^(1/
2)-35/128*c*x*(-c^2*x^2+1)^(1/2)+35/128*arcsin(c*x))+4*c^6*d^3*e*(-1/2*c*x*
(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+6*c^4*d^2*e^2*(-1/4*c^3*x^3*(-c^2*x^2+1
)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))+4*c^2*d*e^3*(-1/6*c^5*x
^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)
^(1/2)+5/16*arcsin(c*x))))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 274, normalized size of antiderivative = 1.06

$$\int x\left(d+ex^2\right)^3(a+b\arcsin(cx))\,dx$$
$$=\frac{384\,ac^8e^3x^8+1536\,ac^8de^2x^6+2304\,ac^8d^2ex^4+1536\,ac^8d^3x^2+3\left(128\,bc^8e^3x^8+512\,bc^8de^2x^6+768\,bc^8d^2e\right.}{}$$

```
[In] integrate(x*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/3072*(384*a*c^8*e^3*x^8 + 1536*a*c^8*d*e^2*x^6 + 2304*a*c^8*d^2*e*x^4 + 1
536*a*c^8*d^3*x^2 + 3*(128*b*c^8*e^3*x^8 + 512*b*c^8*d*e^2*x^6 + 768*b*c^8*
d^2*e*x^4 + 512*b*c^8*d^3*x^2 - 256*b*c^6*d^3 - 288*b*c^4*d^2*e - 160*b*c^2
*d*e^2 - 35*b*e^3)*arcsin(c*x) + (48*b*c^7*e^3*x^7 + 8*(32*b*c^7*d*e^2 + 7*
b*c^5*e^3)*x^5 + 2*(288*b*c^7*d^2*e + 160*b*c^5*d*e^2 + 35*b*c^3*e^3)*x^3 +
 3*(256*b*c^7*d^3 + 288*b*c^5*d^2*e + 160*b*c^3*d*e^2 + 35*b*c*e^3)*x)*sqrt
(-c^2*x^2 + 1))/c^8
```

Sympy [A] (verification not implemented)

Time = 0.95 (sec) , antiderivative size = 483, normalized size of antiderivative = 1.87

$$\int x\left(d+ex^2\right)^3(a+b\arcsin(cx))\,dx$$
$$=\begin{cases}\frac{ad^3x^2}{2}+\frac{3ad^2ex^4}{4}+\frac{ade^2x^6}{2}+\frac{ae^3x^8}{8}+\frac{bd^3x^2\operatorname{asin}(cx)}{2}+\frac{3bd^2ex^4\operatorname{asin}(cx)}{4}+\frac{bde^2x^6\operatorname{asin}(cx)}{2}+\frac{be^3x^8\operatorname{asin}(cx)}{8}+\frac{bd^3x\sqrt{-c^2x^2+}}{4c} \\ a\left(\frac{d^3x^2}{2}+\frac{3d^2ex^4}{4}+\frac{de^2x^6}{2}+\frac{e^3x^8}{8}\right)\end{cases}$$

```
[In] integrate(x*(e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**2/2 + 3*a*d**2*e*x**4/4 + a*d*e**2*x**6/2 + a*e**3*x**
8/8 + b*d**3*x**2*asin(c*x)/2 + 3*b*d**2*e*x**4*asin(c*x)/4 + b*d*e**2*x**6
*asin(c*x)/2 + b*e**3*x**8*asin(c*x)/8 + b*d**3*x*sqrt(-c**2*x**2 + 1)/(4*c
) + 3*b*d**2*e*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*d*e**2*x**5*sqrt(-c**2*
x**2 + 1)/(12*c) + b*e**3*x**7*sqrt(-c**2*x**2 + 1)/(64*c) - b*d**3*asin(c*
x)/(4*c**2) + 9*b*d**2*e*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 5*b*d*e**2*x**3
*sqrt(-c**2*x**2 + 1)/(48*c**3) + 7*b*e**3*x**5*sqrt(-c**2*x**2 + 1)/(384*c
**3) - 9*b*d**2*e*asin(c*x)/(32*c**4) + 5*b*d*e**2*x*sqrt(-c**2*x**2 + 1)/(
32*c**5) + 35*b*e**3*x**3*sqrt(-c**2*x**2 + 1)/(1536*c**5) - 5*b*d*e**2*asi
n(c*x)/(32*c**6) + 35*b*e**3*x*sqrt(-c**2*x**2 + 1)/(1024*c**7) - 35*b*e**3
*asin(c*x)/(1024*c**8), Ne(c, 0)), (a*(d**3*x**2/2 + 3*d**2*e*x**4/4 + d*e*
*2*x**6/2 + e**3*x**8/8), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 344, normalized size of antiderivative = 1.33

$$\int x\left(d+ex^2\right)^3(a+b\arcsin(cx))\,dx=\frac{1}{8}\,ae^3x^8+\frac{1}{2}\,ade^2x^6+\frac{3}{4}\,ad^2ex^4$$
$$+\frac{1}{2}\,ad^3x^2+\frac{1}{4}\left(2\,x^2\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2}-\frac{\arcsin(cx)}{c^3}\right)\right)bd^3$$
$$+\frac{3}{32}\left(8\,x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\arcsin(cx)}{c^5}\right)c\right)bd^2e$$
$$+\frac{1}{96}\left(48\,x^6\arcsin(cx)+\left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2}+\frac{10\sqrt{-c^2x^2+1}x^3}{c^4}+\frac{15\sqrt{-c^2x^2+1}x}{c^6}-\frac{15\arcsin(cx)}{c^7}\right)c$$
$$+\frac{1}{3072}\left(384\,x^8\arcsin(cx)+\left(\frac{48\sqrt{-c^2x^2+1}x^7}{c^2}+\frac{56\sqrt{-c^2x^2+1}x^5}{c^4}+\frac{70\sqrt{-c^2x^2+1}x^3}{c^6}+\frac{105\sqrt{-c^2x}}{c^8}\right.\right.$$

```
[In] integrate(x*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/8*a*e^3*x^8 + 1/2*a*d*e^2*x^6 + 3/4*a*d^2*e*x^4 + 1/2*a*d^3*x^2 + 1/4*(2*
x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^3 + 3
/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 +
1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d^2*e + 1/96*(48*x^6*arcsin(c*x) + (8*sq
rt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2
 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*d*e^2 + 1/3072*(384*x^8*arcsin(c*x)
+ (48*sqrt(-c^2*x^2 + 1)*x^7/c^2 + 56*sqrt(-c^2*x^2 + 1)*x^5/c^4 + 70*sqrt(
-c^2*x^2 + 1)*x^3/c^6 + 105*sqrt(-c^2*x^2 + 1)*x/c^8 - 105*arcsin(c*x)/c^9)
*c)*b*e^3
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 597 vs. $2(238) = 476$.

Time = 0.29 (sec) , antiderivative size = 597, normalized size of antiderivative = 2.31

$$\int x(d+ex^2)^3(a+b\arcsin(cx))\,dx = \frac{1}{8}ae^3x^8 + \frac{1}{2}ade^2x^6 + \frac{3}{4}ad^2ex^4 + \frac{\sqrt{-c^2x^2+1}bd^3x}{4c} + \frac{(c^2x^2-1)bd^3\arcsin(cx)}{2c^2} - \frac{3(-c^2x^2+1)^{\frac{3}{2}}bd^2ex}{16c^3} + \frac{(c^2x^2-1)ad^3}{2c^2} + \frac{bd^3\arcsin(cx)}{4c^2} + \frac{3(c^2x^2-1)^2bd^2e\arcsin(cx)}{4c^4} + \frac{15\sqrt{-c^2x^2+1}bd^2ex}{32c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}bde^2x}{12c^5} + \frac{3(c^2x^2-1)bd^2e\arcsin(cx)}{2c^4} + \frac{(c^2x^2-1)^3bde^2\arcsin(cx)}{2c^6} - \frac{13(-c^2x^2+1)^{\frac{3}{2}}bde^2x}{48c^5} + \frac{(c^2x^2-1)^3\sqrt{-c^2x^2+1}be^3x}{64c^7} + \frac{15bd^2e\arcsin(cx)}{32c^4} + \frac{3(c^2x^2-1)^2bde^2\arcsin(cx)}{2c^6} + \frac{(c^2x^2-1)^4be^3\arcsin(cx)}{8c^8} + \frac{11\sqrt{-c^2x^2+1}bde^2x}{32c^5} + \frac{25(c^2x^2-1)^2\sqrt{-c^2x^2+1}be^3x}{384c^7} + \frac{3(c^2x^2-1)bde^2\arcsin(cx)}{2c^6} + \frac{(c^2x^2-1)^3be^3\arcsin(cx)}{2c^8} - \frac{163(-c^2x^2+1)^{\frac{3}{2}}be^3x}{1536c^7} + \frac{11bde^2\arcsin(cx)}{32c^6} + \frac{3(c^2x^2-1)^2be^3\arcsin(cx)}{4c^8} + \frac{93\sqrt{-c^2x^2+1}be^3x}{1024c^7} + \frac{(c^2x^2-1)be^3\arcsin(cx)}{2c^8} + \frac{93be^3\arcsin(cx)}{1024c^8}$$

```
[In] integrate(x*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/8*a*e^3*x^8 + 1/2*a*d*e^2*x^6 + 3/4*a*d^2*e*x^4 + 1/4*sqrt(-c^2*x^2 + 1)*
b*d^3*x/c + 1/2*(c^2*x^2 - 1)*b*d^3*arcsin(c*x)/c^2 - 3/16*(-c^2*x^2 + 1)^(
3/2)*b*d^2*e*x/c^3 + 1/2*(c^2*x^2 - 1)*a*d^3/c^2 + 1/4*b*d^3*arcsin(c*x)/c^
2 + 3/4*(c^2*x^2 - 1)^2*b*d^2*e*arcsin(c*x)/c^4 + 15/32*sqrt(-c^2*x^2 + 1)*
b*d^2*e*x/c^3 + 1/12*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e^2*x/c^5 + 3/2
*(c^2*x^2 - 1)*b*d^2*e*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^3*b*d*e^2*arcsin
```

```
(c*x)/c^6 - 13/48*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*x/c^5 + 1/64*(c^2*x^2 - 1)^3
*sqrt(-c^2*x^2 + 1)*b*e^3*x/c^7 + 15/32*b*d^2*e*arcsin(c*x)/c^4 + 3/2*(c^2*
x^2 - 1)^2*b*d*e^2*arcsin(c*x)/c^6 + 1/8*(c^2*x^2 - 1)^4*b*e^3*arcsin(c*x)/
c^8 + 11/32*sqrt(-c^2*x^2 + 1)*b*d*e^2*x/c^5 + 25/384*(c^2*x^2 - 1)^2*sqrt(
-c^2*x^2 + 1)*b*e^3*x/c^7 + 3/2*(c^2*x^2 - 1)*b*d*e^2*arcsin(c*x)/c^6 + 1/2
*(c^2*x^2 - 1)^3*b*e^3*arcsin(c*x)/c^8 - 163/1536*(-c^2*x^2 + 1)^(3/2)*b*e^
3*x/c^7 + 11/32*b*d*e^2*arcsin(c*x)/c^6 + 3/4*(c^2*x^2 - 1)^2*b*e^3*arcsin(
c*x)/c^8 + 93/1024*sqrt(-c^2*x^2 + 1)*b*e^3*x/c^7 + 1/2*(c^2*x^2 - 1)*b*e^3
*arcsin(c*x)/c^8 + 93/1024*b*e^3*arcsin(c*x)/c^8
```

Mupad [F(-1)]

Timed out.

$$\int x(d+ex^2)^3 (a+b\arcsin(cx))\,dx = \int x\,(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^3 dx$$

```
[In] int(x*(a + b*asin(c*x))*(d + e*x^2)^3,x)
[Out] int(x*(a + b*asin(c*x))*(d + e*x^2)^3, x)
```

3.618 $\int (d+ex^2)^3 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 18, antiderivative size = 225

$$\int (d+ex^2)^3 (a+b\arcsin(cx))\,dx = \frac{b(35c^6d^3+35c^4d^2e+21c^2de^2+5e^3)\sqrt{1-c^2x^2}}{35c^7} - \frac{be(35c^4d^2+42c^2de+15e^2)(1-c^2x^2)^{3/2}}{105c^7} + \frac{3be^2(7c^2d+5e)(1-c^2x^2)^{5/2}}{175c^7} - \frac{be^3(1-c^2x^2)^{7/2}}{49c^7} + d^3x(a+b\arcsin(cx)) + d^2ex^3(a+b\arcsin(cx)) + \frac{3}{5}de^2x^5(a+b\arcsin(cx)) + \frac{1}{7}e^3x^7(a+b\arcsin(cx))$$

```
[Out] -1/105*b*e*(35*c^4*d^2+42*c^2*d*e+15*e^2)*(-c^2*x^2+1)^(3/2)/c^7+3/175*b*e^
2*(7*c^2*d+5*e)*(-c^2*x^2+1)^(5/2)/c^7-1/49*b*e^3*(-c^2*x^2+1)^(7/2)/c^7+d^
3*x*(a+b*arcsin(c*x))+d^2*e*x^3*(a+b*arcsin(c*x))+3/5*d*e^2*x^5*(a+b*arcsin
(c*x))+1/7*e^3*x^7*(a+b*arcsin(c*x))+1/35*b*(35*c^6*d^3+35*c^4*d^2*e+21*c^2
*d*e^2+5*e^3)*(-c^2*x^2+1)^(1/2)/c^7
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 225, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used

$= \{200, 4755, 12, 1813, 1864\}$

$$\int \left(d+ex^2\right)^3 (a+b\arcsin(cx))\,dx = d^3x(a+b\arcsin(cx))+d^2ex^3(a+b\arcsin(cx)) + \frac{3}{5}de^2x^5(a+b\arcsin(cx))+\frac{1}{7}e^3x^7(a+b\arcsin(cx)) + \frac{3be^2(1-c^2x^2)^{5/2}\left(7c^2d+5e\right)}{175c^7}-\frac{be^3(1-c^2x^2)^{7/2}}{49c^7} - \frac{be(1-c^2x^2)^{3/2}\left(35c^4d^2+42c^2de+15e^2\right)}{105c^7} + \frac{b\sqrt{1-c^2x^2}(35c^6d^3+35c^4d^2e+21c^2de^2+5e^3)}{35c^7}$$

```
[In] Int[(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(35*c^6*d^3 + 35*c^4*d^2*e + 21*c^2*d*e^2 + 5*e^3)*Sqrt[1 - c^2*x^2])/(3
5*c^7) - (b*e*(35*c^4*d^2 + 42*c^2*d*e + 15*e^2)*(1 - c^2*x^2)^(3/2))/(105*
c^7) + (3*b*e^2*(7*c^2*d + 5*e)*(1 - c^2*x^2)^(5/2))/(175*c^7) - (b*e^3*(1
- c^2*x^2)^(7/2))/(49*c^7) + d^3*x*(a + b*ArcSin[c*x]) + d^2*e*x^3*(a + b*A
rcSin[c*x]) + (3*d*e^2*x^5*(a + b*ArcSin[c*x]))/5 + (e^3*x^7*(a + b*ArcSin[
c*x]))/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 4755

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
```

```
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rubi steps

$$\begin{aligned}
\text{integral} &= d^3x(a+b\arcsin(cx)) + d^2ex^3(a+b\arcsin(cx)) + \frac{3}{5}de^2x^5(a+b\arcsin(cx)) \\
&\quad + \frac{1}{7}e^3x^7(a+b\arcsin(cx)) - (bc)\int \frac{x(35d^3+35d^2ex^2+21de^2x^4+5e^3x^6)}{35\sqrt{1-c^2x^2}}\,dx \\
&= d^3x(a+b\arcsin(cx)) + d^2ex^3(a+b\arcsin(cx)) + \frac{3}{5}de^2x^5(a+b\arcsin(cx)) \\
&\quad + \frac{1}{7}e^3x^7(a+b\arcsin(cx)) - \frac{1}{35}(bc)\int \frac{x(35d^3+35d^2ex^2+21de^2x^4+5e^3x^6)}{\sqrt{1-c^2x^2}}\,dx \\
&= d^3x(a+b\arcsin(cx)) + d^2ex^3(a+b\arcsin(cx)) + \frac{3}{5}de^2x^5(a+b\arcsin(cx)) + \frac{1}{7}e^3x^7(a \\
&\quad + b\arcsin(cx)) - \frac{1}{70}(bc)\text{Subst}\left(\int \frac{35d^3+35d^2ex+21de^2x^2+5e^3x^3}{\sqrt{1-c^2x}}\,dx, x, x^2\right) \\
&= d^3x(a+b\arcsin(cx)) + d^2ex^3(a+b\arcsin(cx)) + \frac{3}{5}de^2x^5(a+b\arcsin(cx)) \\
&\quad + \frac{1}{7}e^3x^7(a+b\arcsin(cx)) - \frac{1}{70}(bc)\text{Subst}\left(\int \left(\frac{35c^6d^3+35c^4d^2e+21c^2de^2+5e^3}{c^6\sqrt{1-c^2x}}\right.\right. \\
&\quad - \frac{e(35c^4d^2+42c^2de+15e^2)\sqrt{1-c^2x}}{c^6} + \frac{3e^2(7c^2d+5e)(1-c^2x)^{3/2}}{c^6} \\
&\quad \left.\left. - \frac{5e^3(1-c^2x)^{5/2}}{c^6}\right)\,dx, x, x^2\right) \\
&= \frac{b(35c^6d^3+35c^4d^2e+21c^2de^2+5e^3)\sqrt{1-c^2x^2}}{35c^7} \\
&\quad - \frac{be(35c^4d^2+42c^2de+15e^2)(1-c^2x^2)^{3/2}}{105c^7} \\
&\quad + \frac{3be^2(7c^2d+5e)(1-c^2x^2)^{5/2}}{175c^7} - \frac{be^3(1-c^2x^2)^{7/2}}{49c^7} \\
&\quad + d^3x(a+b\arcsin(cx)) + d^2ex^3(a+b\arcsin(cx)) + \frac{3}{5}de^2x^5(a+b\arcsin(cx)) + \frac{1}{7}e^3x^7(a+b\arcsin(cx))
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 187, normalized size of antiderivative = 0.83

$$\int \left(d+ex^2\right)^3 (a+b\arcsin(cx))\,dx$$
$$= \frac{105ax(35d^3+35d^2ex^2+21de^2x^4+5e^3x^6)+\frac{b\sqrt{1-c^2x^2}(240e^3+24c^2e^2(49d+5ex^2)+2c^4e(1225d^2+294dex^2+45e^2x^4)+c^6(3675d}{c^7}}{3675}$$

[In] Integrate[(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]

[Out] (105*a*x*(35*d^3 + 35*d^2*e*x^2 + 21*d*e^2*x^4 + 5*e^3*x^6) + (b*Sqrt[1 - c^2*x^2]*(240*e^3 + 24*c^2*e^2*(49*d + 5*e*x^2) + 2*c^4*e*(1225*d^2 + 294*d*e*x^2 + 45*e^2*x^4) + c^6*(3675*d^3 + 1225*d^2*e*x^2 + 441*d*e^2*x^4 + 75*e^3*x^6)))/c^7 + 105*b*x*(35*d^3 + 35*d^2*e*x^2 + 21*d*e^2*x^4 + 5*e^3*x^6)*ArcSin[c*x])/3675

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 305, normalized size of antiderivative = 1.36

method	result
parts	$a\left(\frac{1}{7}e^3x^7+\frac{3}{5}d\,e^2x^5+d^2e\,x^3+d^3x\right)+\frac{b\left(\frac{c\arcsin(cx)e^3x^7}{7}+\frac{3c\arcsin(cx)d\,e^2x^5}{5}+c\arcsin(cx)d^2e\,x^3+\arcsin(cx)\right.}{}$
derivativedivides	$\frac{a\left(d^3c^7x+d^2c^7e\,x^3+\frac{3}{5}d\,c^7e^2x^5+\frac{1}{7}e^3c^7x^7\right)}{c^6}+\frac{b\left(\arcsin(cx)d^3c^7x+\arcsin(cx)d^2c^7e\,x^3+\frac{3\arcsin(cx)d\,c^7e^2x^5}{5}+\frac{\arcsin(cx)e^3c^7x^7}{7}-\frac{e^3(}{}\right.}{}$
default	$\frac{a\left(d^3c^7x+d^2c^7e\,x^3+\frac{3}{5}d\,c^7e^2x^5+\frac{1}{7}e^3c^7x^7\right)}{c^6}+\frac{b\left(\arcsin(cx)d^3c^7x+\arcsin(cx)d^2c^7e\,x^3+\frac{3\arcsin(cx)d\,c^7e^2x^5}{5}+\frac{\arcsin(cx)e^3c^7x^7}{7}-\frac{e^3(}{}\right.}{}$

[In] int((e*x^2+d)^3*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)

[Out] a*(1/7*e^3*x^7+3/5*d*e^2*x^5+d^2*e*x^3+d^3*x)+b/c*(1/7*c*arcsin(c*x)*e^3*x^7+3/5*c*arcsin(c*x)*d*e^2*x^5+c*arcsin(c*x)*d^2*e*x^3+arcsin(c*x)*d^3*c*x-1/35/c^6*(5*e^3*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2))-35*d^3*c^6*(-c^2*x^2+1)^(1/2)+21*d*c^2*e^2*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))+35*d^2*c^4*e*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))))

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.02

$$\int (d+ex^2)^3 (a+b\arcsin(cx))\,dx$$
$$= \frac{525\,ac^7e^3x^7 + 2205\,ac^7de^2x^5 + 3675\,ac^7d^2ex^3 + 3675\,ac^7d^3x + 105\,(5\,bc^7e^3x^7 + 21\,bc^7de^2x^5 + 35\,bc^7d^2ex^3}{}$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/3675*(525*a*c^7*e^3*x^7 + 2205*a*c^7*d*e^2*x^5 + 3675*a*c^7*d^2*e*x^3 + 3
675*a*c^7*d^3*x + 105*(5*b*c^7*e^3*x^7 + 21*b*c^7*d*e^2*x^5 + 35*b*c^7*d^2*
e*x^3 + 35*b*c^7*d^3*x)*arcsin(c*x) + (75*b*c^6*e^3*x^6 + 3675*b*c^6*d^3 +
2450*b*c^4*d^2*e + 1176*b*c^2*d*e^2 + 9*(49*b*c^6*d*e^2 + 10*b*c^4*e^3)*x^4
 + 240*b*e^3 + (1225*b*c^6*d^2*e + 588*b*c^4*d*e^2 + 120*b*c^2*e^3)*x^2)*sq
rt(-c^2*x^2 + 1))/c^7
```

Sympy [A] (verification not implemented)

Time = 0.67 (sec) , antiderivative size = 389, normalized size of antiderivative = 1.73

$$\int (d+ex^2)^3 (a+b\arcsin(cx))\,dx$$
$$= \begin{cases} ad^3x + ad^2ex^3 + \frac{3ade^2x^5}{5} + \frac{ae^3x^7}{7} + bd^3x\operatorname{asin}(cx) + bd^2ex^3\operatorname{asin}(cx) + \frac{3bde^2x^5\operatorname{asin}(cx)}{5} + \frac{be^3x^7\operatorname{asin}(cx)}{7} + \frac{bd^3\sqrt{}}{} \\ a\left(d^3x + d^2ex^3 + \frac{3de^2x^5}{5} + \frac{e^3x^7}{7}\right) \end{cases}$$

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x + a*d**2*e*x**3 + 3*a*d*e**2*x**5/5 + a*e**3*x**7/7 + b
*d**3*x*asin(c*x) + b*d**2*e*x**3*asin(c*x) + 3*b*d*e**2*x**5*asin(c*x)/5 +
 b*e**3*x**7*asin(c*x)/7 + b*d**3*sqrt(-c**2*x**2 + 1)/c + b*d**2*e*x**2*sq
rt(-c**2*x**2 + 1)/(3*c) + 3*b*d*e**2*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*
e**3*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + 2*b*d**2*e*sqrt(-c**2*x**2 + 1)/(3*
c**3) + 4*b*d*e**2*x**2*sqrt(-c**2*x**2 + 1)/(25*c**3) + 6*b*e**3*x**4*sqrt
(-c**2*x**2 + 1)/(245*c**3) + 8*b*d*e**2*sqrt(-c**2*x**2 + 1)/(25*c**5) + 8
*b*e**3*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16*b*e**3*sqrt(-c**2*x**2 +
1)/(245*c**7), Ne(c, 0)), (a*(d**3*x + d**2*e*x**3 + 3*d*e**2*x**5/5 + e**3
*x**7/7), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 292, normalized size of antiderivative = 1.30

$$
\begin{aligned}
\int (d+ex^2)^3 (a+b\arcsin(cx))\,dx &= \frac{1}{7}\,ae^3x^7 + \frac{3}{5}\,ade^2x^5 + ad^2ex^3 \\
&\quad + \frac{1}{3}\left(3\,x^3\arcsin{(cx)} + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2e \\
&\quad + \frac{1}{25}\left(15\,x^5\arcsin{(cx)} + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bde^2 \\
&\quad + \frac{1}{245}\left(35\,x^7\arcsin{(cx)} + \left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2} + \frac{6\sqrt{-c^2x^2+1}x^4}{c^4} + \frac{8\sqrt{-c^2x^2+1}x^2}{c^6} + \frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right. \\
&\quad + ad^3x + \frac{\left(cx\arcsin{(cx)} + \sqrt{-c^2x^2+1}\right)bd^3}{c}
\end{aligned}
$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/7*a*e^3*x^7 + 3/5*a*d*e^2*x^5 + a*d^2*e*x^3 + 1/3*(3*x^3*arcsin(c*x) + c*
(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^2*e + 1/25*(15
*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2
/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d*e^2 + 1/245*(35*x^7*arcsin(c*x) + (
5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x
^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b*e^3 + a*d^3*x + (c*x*arcs
in(c*x) + sqrt(-c^2*x^2 + 1))*b*d^3/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 480 vs. $2(205) = 410$.

Time = 0.32 (sec) , antiderivative size = 480, normalized size of antiderivative = 2.13

$$\int \left(d+ex^2\right)^3 (a+b\arcsin(cx))\,dx = \frac{1}{7}ae^3x^7 + \frac{3}{5}ade^2x^5 + ad^2ex^3 + bd^3x\arcsin(cx) + ad^3x + \frac{(c^2x^2-1)bd^2ex\arcsin(cx)}{c^2} + \frac{bd^2ex\arcsin(cx)}{c^2} + \frac{3\left(c^2x^2-1\right)^2bde^2x\arcsin(cx)}{5\,c^4} + \frac{\sqrt{-c^2x^2+1}bd^3}{c} + \frac{6\,(c^2x^2-1)bde^2x\arcsin(cx)}{5\,c^4} + \frac{\left(c^2x^2-1\right)^3be^3x\arcsin(cx)}{7\,c^6} - \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}bd^2e}{3\,c^3} + \frac{3\,bde^2x\arcsin(cx)}{5\,c^4} + \frac{3\left(c^2x^2-1\right)^2be^3x\arcsin(cx)}{7\,c^6} + \frac{\sqrt{-c^2x^2+1}bd^2e}{c^3} + \frac{3\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}bde^2}{25\,c^5} + \frac{3\,(c^2x^2-1)be^3x\arcsin(cx)}{7\,c^6} - \frac{2\left(-c^2x^2+1\right)^{\frac{3}{2}}bde^2}{5\,c^5} + \frac{\left(c^2x^2-1\right)^3\sqrt{-c^2x^2+1}be^3}{49\,c^7} + \frac{be^3x\arcsin(cx)}{7\,c^6} + \frac{3\sqrt{-c^2x^2+1}bde^2}{5\,c^5} + \frac{3\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}be^3}{35\,c^7} - \frac{\left(-c^2x^2+1\right)^{\frac{3}{2}}be^3}{7\,c^7} + \frac{\sqrt{-c^2x^2+1}be^3}{7\,c^7}$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/7*a*e^3*x^7 + 3/5*a*d*e^2*x^5 + a*d^2*e*x^3 + b*d^3*x*arcsin(c*x) + a*d^3
*x + (c^2*x^2 - 1)*b*d^2*e*x*arcsin(c*x)/c^2 + b*d^2*e*x*arcsin(c*x)/c^2 +
3/5*(c^2*x^2 - 1)^2*b*d*e^2*x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d^3/c
+ 6/5*(c^2*x^2 - 1)*b*d*e^2*x*arcsin(c*x)/c^4 + 1/7*(c^2*x^2 - 1)^3*b*e^3*x
*arcsin(c*x)/c^6 - 1/3*(-c^2*x^2 + 1)^(3/2)*b*d^2*e/c^3 + 3/5*b*d*e^2*x*arc
sin(c*x)/c^4 + 3/7*(c^2*x^2 - 1)^2*b*e^3*x*arcsin(c*x)/c^6 + sqrt(-c^2*x^2
+ 1)*b*d^2*e/c^3 + 3/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^5 + 3/
7*(c^2*x^2 - 1)*b*e^3*x*arcsin(c*x)/c^6 - 2/5*(-c^2*x^2 + 1)^(3/2)*b*d*e^2/
c^5 + 1/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^3/c^7 + 1/7*b*e^3*x*arcsi
n(c*x)/c^6 + 3/5*sqrt(-c^2*x^2 + 1)*b*d*e^2/c^5 + 3/35*(c^2*x^2 - 1)^2*sqrt
(-c^2*x^2 + 1)*b*e^3/c^7 - 1/7*(-c^2*x^2 + 1)^(3/2)*b*e^3/c^7 + 1/7*sqrt(-c
^2*x^2 + 1)*b*e^3/c^7
```

Mupad [F(-1)]

Timed out.

$$\int \left(d+ex^2\right)^3 (a+b\arcsin(cx))\,dx=\int (a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^3\,dx$$

```
[In] int((a + b*asin(c*x))*(d + e*x^2)^3,x)
[Out] int((a + b*asin(c*x))*(d + e*x^2)^3, x)
```

3.619 $\int \frac{(d+ex^2)^3(a+b\arcsin(cx))}{x}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 357

$$\int \frac{(d+ex^2)^3(a+b\arcsin(cx))}{x}\,dx = \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{5be^3x\sqrt{1-c^2x^2}}{96c^5}+\frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c}+\frac{5be^3x^3\sqrt{1-c^2x^2}}{144c^3}+\frac{be^3x^5\sqrt{1-c^2x^2}}{36c}-\frac{3bd^2e\arcsin(cx)}{4c^2}-\frac{9bde^2\arcsin(cx)}{32c^4}-\frac{5be^3\arcsin(cx)}{96c^6}-\frac{1}{2}ibd^3\arcsin(cx)^2+\frac{3}{2}d^2ex^2(a+b\arcsin(cx))+\frac{3}{4}de^2x^4(a+b\arcsin(cx))+\frac{1}{6}e^3x^6(a+b\arcsin(cx))+bd^3\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right)-bd^3\arcsin(cx)\log(x)+d^3(a+b\arcsin(cx))\log(x)-\frac{1}{2}ibd^3\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)$$

```
[Out] -3/4*b*d^2*e*arcsin(c*x)/c^2-9/32*b*d*e^2*arcsin(c*x)/c^4-5/96*b*e^3*arcsin
(c*x)/c^6-1/2*I*b*d^3*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)+3/2*d^2*e*x^2
*(a+b*arcsin(c*x))+3/4*d*e^2*x^4*(a+b*arcsin(c*x))+1/6*e^3*x^6*(a+b*arcsin(
c*x))+b*d^3*arcsin(c*x)*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-b*d^3*arcsin(c*x
)*ln(x)+d^3*(a+b*arcsin(c*x))*ln(x)-1/2*I*b*d^3*arcsin(c*x)^2+3/4*b*d^2*e*x
*(-c^2*x^2+1)^(1/2)/c+9/32*b*d*e^2*x*(-c^2*x^2+1)^(1/2)/c^3+5/96*b*e^3*x*(-
c^2*x^2+1)^(1/2)/c^5+3/16*b*d*e^2*x^3*(-c^2*x^2+1)^(1/2)/c+5/144*b*e^3*x^3*
(-c^2*x^2+1)^(1/2)/c^3+1/36*b*e^3*x^5*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 357, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.619, Rules used = {272, 45, 4815, 12, 6874, 327, 222, 2363, 4721, 3798, 2221, 2317, 2438}

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x} dx = d^3\log(x)(a+b\arcsin(cx))+\frac{3}{2}d^2ex^2(a+b\arcsin(cx)) +\frac{3}{4}de^2x^4(a+b\arcsin(cx))+\frac{1}{6}e^3x^6(a+b\arcsin(cx)) -\frac{5be^3\arcsin(cx)}{96c^6}-\frac{9bde^2\arcsin(cx)}{32c^4}-\frac{3bd^2e\arcsin(cx)}{4c^2} -\frac{1}{2}ibd^3\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)-\frac{1}{2}ibd^3\arcsin(cx)^2 +bd^3\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) -bd^3\log(x)\arcsin(cx) +\frac{3bd^2ex\sqrt{1-c^2x^2}}{4c}+\frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c} +\frac{be^3x^5\sqrt{1-c^2x^2}}{36c}+\frac{5be^3x\sqrt{1-c^2x^2}}{96c^5} +\frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3}+\frac{5be^3x^3\sqrt{1-c^2x^2}}{144c^3}$$

```
[In] Int[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (3*b*d^2*e*x*Sqrt[1 - c^2*x^2])/(4*c) + (9*b*d*e^2*x*Sqrt[1 - c^2*x^2])/(32
*c^3) + (5*b*e^3*x*Sqrt[1 - c^2*x^2])/(96*c^5) + (3*b*d*e^2*x^3*Sqrt[1 - c^
2*x^2])/(16*c) + (5*b*e^3*x^3*Sqrt[1 - c^2*x^2])/(144*c^3) + (b*e^3*x^5*Sqr
t[1 - c^2*x^2])/(36*c) - (3*b*d^2*e*ArcSin[c*x])/(4*c^2) - (9*b*d*e^2*ArcSi
n[c*x])/(32*c^4) - (5*b*e^3*ArcSin[c*x])/(96*c^6) - (I/2)*b*d^3*ArcSin[c*x]
^2 + (3*d^2*e*x^2*(a + b*ArcSin[c*x]))/2 + (3*d*e^2*x^4*(a + b*ArcSin[c*x])
)/4 + (e^3*x^6*(a + b*ArcSin[c*x]))/6 + b*d^3*ArcSin[c*x]*Log[1 - E^((2*I)*
ArcSin[c*x])] - b*d^3*ArcSin[c*x]*Log[x] + d^3*(a + b*ArcSin[c*x])*Log[x] -
 (I/2)*b*d^3*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2363

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]*((a + b*Log[c*x^n])/Rt[-e, 2]), x
] - Dist[b*(n/Rt[-e, 2]), Int[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{3}{2}d^2ex^2(a+b\arcsin(cx))+\frac{3}{4}de^2x^4(a+b\arcsin(cx))+\frac{1}{6}e^3x^6(a+b\arcsin(cx)) \\
&\quad +d^3(a+b\arcsin(cx))\log(x)-(bc)\int\frac{18d^2ex^2+9de^2x^4+2e^3x^6+12d^3\log(x)}{12\sqrt{1-c^2x^2}}\,dx \\
&= \frac{3}{2}d^2ex^2(a+b\arcsin(cx))+\frac{3}{4}de^2x^4(a+b\arcsin(cx))+\frac{1}{6}e^3x^6(a+b\arcsin(cx))+d^3(a \\
&\quad +b\arcsin(cx))\log(x)-\frac{1}{12}(bc)\int\frac{18d^2ex^2+9de^2x^4+2e^3x^6+12d^3\log(x)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{3}{2}d^2ex^2(a+b\arcsin(cx))+\frac{3}{4}de^2x^4(a+b\arcsin(cx)) \\
&\quad +\frac{1}{6}e^3x^6(a+b\arcsin(cx))+d^3(a+b\arcsin(cx))\log(x) \\
&\quad -\frac{1}{12}(bc)\int\left(\frac{18d^2ex^2}{\sqrt{1-c^2x^2}}+\frac{9de^2x^4}{\sqrt{1-c^2x^2}}+\frac{2e^3x^6}{\sqrt{1-c^2x^2}}+\frac{12d^3\log(x)}{\sqrt{1-c^2x^2}}\right)dx \\
&= \frac{3}{2}d^2ex^2(a+b\arcsin(cx))+\frac{3}{4}de^2x^4(a+b\arcsin(cx))+\frac{1}{6}e^3x^6(a+b\arcsin(cx)) \\
&\quad +d^3(a+b\arcsin(cx))\log(x)-(bcd^3)\int\frac{\log(x)}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{2}(3bcd^2e)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx \\
&\quad -\frac{1}{4}(3bcde^2)\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{6}(bce^3)\int\frac{x^6}{\sqrt{1-c^2x^2}}\,dx
\end{aligned}$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c} + \frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c} + \frac{be^3x^5\sqrt{1-c^2x^2}}{36c} + \frac{3}{2}d^2ex^2(a+b\arcsin(cx)) + \frac{3}{4}de^2x^4(a+b\arcsin(cx)) + \frac{1}{6}e^3x^6(a+b\arcsin(cx)) - bd^3\arcsin(cx)\log(x) + d^3(a+b\arcsin(cx))\log(x) + (bd^3)\int\frac{\arcsin(cx)}{x}\,dx - \frac{(3bd^2e)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{4c} - \frac{(9bde^2)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{16c} - \frac{(5be^3)\int\frac{x^4}{\sqrt{1-c^2x^2}}\,dx}{36c}$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c} + \frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3} + \frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c} + \frac{5be^3x^3\sqrt{1-c^2x^2}}{144c^3} + \frac{be^3x^5\sqrt{1-c^2x^2}}{36c} - \frac{3bd^2e\arcsin(cx)}{4c^2} + \frac{3}{2}d^2ex^2(a+b\arcsin(cx)) + \frac{3}{4}de^2x^4(a+b\arcsin(cx)) + \frac{1}{6}e^3x^6(a+b\arcsin(cx)) - bd^3\arcsin(cx)\log(x) + d^3(a+b\arcsin(cx))\log(x) + (bd^3)\,\mathrm{Subst}\left(\int x\cot(x)\,dx, x, \arcsin(cx)\right) - \frac{(9bde^2)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{32c^3} - \frac{(5be^3)\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{48c^3}$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c} + \frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3} + \frac{5be^3x\sqrt{1-c^2x^2}}{96c^5} + \frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c} + \frac{5be^3x^3\sqrt{1-c^2x^2}}{144c^3} + \frac{be^3x^5\sqrt{1-c^2x^2}}{36c} - \frac{3bd^2e\arcsin(cx)}{4c^2} - \frac{9bde^2\arcsin(cx)}{32c^4} - \frac{1}{2}ibd^3\arcsin(cx)^2 + \frac{3}{2}d^2ex^2(a+b\arcsin(cx)) + \frac{3}{4}de^2x^4(a+b\arcsin(cx)) + \frac{1}{6}e^3x^6(a+b\arcsin(cx)) - bd^3\arcsin(cx)\log(x) + d^3(a+b\arcsin(cx))\log(x) - (2ibd^3)\,\mathrm{Subst}\left(\int\frac{e^{2ix}x}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right) - \frac{(5be^3)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{96c^5}$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c} + \frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3} + \frac{5be^3x\sqrt{1-c^2x^2}}{96c^5} + \frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c} + \frac{5be^3x^3\sqrt{1-c^2x^2}}{144c^3} + \frac{be^3x^5\sqrt{1-c^2x^2}}{36c} - \frac{3bd^2e\arcsin(cx)}{4c^2} - \frac{9bde^2\arcsin(cx)}{32c^4} - \frac{5be^3\arcsin(cx)}{96c^6} - \frac{1}{2}ibd^3\arcsin(cx)^2 + \frac{3}{2}d^2ex^2(a+b\arcsin(cx)) + \frac{3}{4}de^2x^4(a+b\arcsin(cx)) + \frac{1}{6}e^3x^6(a+b\arcsin(cx)) + bd^3\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - bd^3\arcsin(cx)\log(x) + d^3(a+b\arcsin(cx))\log(x) - (bd^3)\,\mathrm{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c} + \frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3} + \frac{5be^3x\sqrt{1-c^2x^2}}{96c^5} + \frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c} + \frac{5be^3x^3\sqrt{1-c^2x^2}}{144c^3} + \frac{be^3x^5\sqrt{1-c^2x^2}}{36c} - \frac{3bd^2e\arcsin(cx)}{4c^2} - \frac{9bde^2\arcsin(cx)}{32c^4} - \frac{5be^3\arcsin(cx)}{96c^6} - \frac{1}{2}ibd^3\arcsin(cx)^2 + \frac{3}{2}d^2ex^2(a+b\arcsin(cx)) + \frac{3}{4}de^2x^4(a + b\arcsin(cx)) + \frac{1}{6}e^3x^6(a+b\arcsin(cx)) + bd^3\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - bd^3\arcsin(cx)\log(x) + d^3(a+b\arcsin(cx))\log(x) + \frac{1}{2}(ibd^3)\operatorname{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)$$

$$= \frac{3bd^2ex\sqrt{1-c^2x^2}}{4c} + \frac{9bde^2x\sqrt{1-c^2x^2}}{32c^3} + \frac{5be^3x\sqrt{1-c^2x^2}}{96c^5} + \frac{3bde^2x^3\sqrt{1-c^2x^2}}{16c} + \frac{5be^3x^3\sqrt{1-c^2x^2}}{144c^3} + \frac{be^3x^5\sqrt{1-c^2x^2}}{36c} - \frac{3bd^2e\arcsin(cx)}{4c^2} - \frac{9bde^2\arcsin(cx)}{32c^4} - \frac{5be^3\arcsin(cx)}{96c^6} - \frac{1}{2}ibd^3\arcsin(cx)^2 + \frac{3}{2}d^2ex^2(a+b\arcsin(cx)) + \frac{3}{4}de^2x^4(a+b\arcsin(cx)) + \frac{1}{6}e^3x^6(a+b\arcsin(cx)) + bd^3\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - bd^3\arcsin(cx)\log(x) + d^3(a+b\arcsin(cx))\log(x) - \frac{1}{2}ibd^3\operatorname{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.38 (sec) , antiderivative size = 322, normalized size of antiderivative = 0.90

$$\int \frac{(d+ex^2)^3(a+b\arcsin(cx))}{x}\,dx$$

$$= \frac{1}{12}\left(18ad^2ex^2 + 9ade^2x^4 + 2ae^3x^6 + 18bd^2ex^2\arcsin(cx) + 9bde^2x^4\arcsin(cx) + 2be^3x^6\arcsin(cx) + \frac{be^3\left(cx\sqrt{1-c^2x^2}(15+10c^2x^2+8c^4x^4) - 30\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{24c^6} + \frac{9bde^2\left(cx\sqrt{1-c^2x^2}(3+2c^2x^2) - 6\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{8c^4} + \frac{9bd^2e\left(cx\sqrt{1-c^2x^2} - 2\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{c^2} + 12bd^3\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) + 12ad^3\log(x) - 6ibd^3\left(\arcsin(cx)^2 + \operatorname{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)\right)\right)$$

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x,x]
```

```
[Out] (18*a*d^2*e*x^2 + 9*a*d*e^2*x^4 + 2*a*e^3*x^6 + 18*b*d^2*e*x^2*ArcSin[c*x]
+ 9*b*d*e^2*x^4*ArcSin[c*x] + 2*b*e^3*x^6*ArcSin[c*x] + (b*e^3*(c*x*Sqrt[1
- c^2*x^2]*(15 + 10*c^2*x^2 + 8*c^4*x^4) - 30*ArcTan[(c*x)/(-1 + Sqrt[1 - c
^2*x^2])]))/(24*c^6) + (9*b*d*e^2*(c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2) -
6*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])]))/(8*c^4) + (9*b*d^2*e*(c*x*Sqrt[1
 - c^2*x^2] - 2*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])]))/c^2 + 12*b*d^3*Arc
Sin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + 12*a*d^3*Log[x] - (6*I)*b*d^3*(Ar
cSin[c*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x])]))/12
```

Maple [A] (verified)

Time = 0.40 (sec) , antiderivative size = 341, normalized size of antiderivative = 0.96

method	result
parts	$a\left(\frac{e^3x^6}{6}+\frac{3d\,e^2x^4}{4}+\frac{3d^2e\,x^2}{2}+d^3\ln\left(x\right)\right)+b\left(-\frac{i\arcsin(cx)^2d^3}{2}+d^3\arcsin\left(cx\right)\ln\left(1+icx+\sqrt{}\right.\right.$
derivativedivides	$\frac{a\left(\frac{3c^6d^2e\,x^2}{2}+\frac{3c^6d\,e^2x^4}{4}+\frac{e^3c^6x^6}{6}+c^6d^3\ln(cx)\right)}{c^6}+\frac{b\left(-\frac{ic^6d^3\arcsin(cx)^2}{2}+c^6d^3\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+c^6d\right.}{}$
default	$\frac{a\left(\frac{3c^6d^2e\,x^2}{2}+\frac{3c^6d\,e^2x^4}{4}+\frac{e^3c^6x^6}{6}+c^6d^3\ln(cx)\right)}{c^6}+\frac{b\left(-\frac{ic^6d^3\arcsin(cx)^2}{2}+c^6d^3\arcsin(cx)\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)+c^6d\right.}{}$

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))/x,x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/6*e^3*x^6+3/4*d*e^2*x^4+3/2*d^2*e*x^2+d^3*ln(x))+b*(-1/2*I*arcsin(c*x)
^2*d^3+d^3*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+d^3*arcsin(c*x)*ln(1-
I*c*x-(-c^2*x^2+1)^(1/2))-I*d^3*polylog(2,-I*c*x-(-c^2*x^2+1)^(1/2))-I*d^3*
polylog(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/192*arcsin(c*x)*e^3/c^6*cos(6*arcsin(
c*x))+1/1152*e^3/c^6*sin(6*arcsin(c*x))+1/32*arcsin(c*x)*e^2*(3*c^2*d+e)/c^
6*cos(4*arcsin(c*x))-3/128*e^2/c^4*sin(4*arcsin(c*x))*d-1/128*e^3/c^6*sin(4
*arcsin(c*x))-1/64*e*arcsin(c*x)*(48*c^4*d^2+24*c^2*d*e+5*e^2)/c^6*cos(2*ar
csin(c*x))+3/8*e/c^2*sin(2*arcsin(c*x))*d^2+3/16*e^2/c^4*sin(2*arcsin(c*x))
*d+5/128*e^3/c^6*sin(2*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{(d+ex^2)^3\,(a+b\arcsin(cx))}{x}\,dx=\int \frac{(ex^2+d)^3(b\arcsin\left(cx\right)+a)}{x}\,dx$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*e^3*x^6 + 3*a*d*e^2*x^4 + 3*a*d^2*e*x^2 + a*d^3 + (b*e^3*x^6 +
3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arcsin(c*x))/x, x)
```

Sympy [F]

$$\int \frac{(d+ex^2)^3\,(a+b\arcsin(cx))}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(d+ex^2)^3}{x}\,dx$$

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))/x,x)
```

```
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)**3/x, x)
```

Maxima [F]

$$\int \frac{(d+ex^2)^3\,(a+b\arcsin(cx))}{x}\,dx = \int \frac{(ex^2+d)^3(b\arcsin\,(cx)+a)}{x}\,dx$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/6*a*e^3*x^6 + 3/4*a*d*e^2*x^4 + 3/2*a*d^2*e*x^2 + a*d^3*log(x) + integrat
e((b*e^3*x^6 + 3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))/x, x)
```

Giac [F]

$$\int \frac{(d+ex^2)^3\,(a+b\arcsin(cx))}{x}\,dx = \int \frac{(ex^2+d)^3(b\arcsin\,(cx)+a)}{x}\,dx$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^3*(b*arcsin(c*x) + a)/x, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex^2)^3\,(a+b\arcsin(cx))}{x}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^3}{x}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x,x)
```

```
[Out] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x, x)
```

3.620 $\int \frac{(d+ex^2)^3(a+b\arcsin(cx))}{x^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 190

$$\begin{aligned}\int \frac{(d+ex^2)^3\,(a+b\arcsin(cx))}{x^2}\,dx &= \frac{be(15c^4d^2+5c^2de+e^2)\sqrt{1-c^2x^2}}{5c^5}\\ &\quad-\frac{be^2(5c^2d+2e)\,(1-c^2x^2)^{3/2}}{15c^5}\\ &\quad+\frac{be^3(1-c^2x^2)^{5/2}}{25c^5}-\frac{d^3(a+b\arcsin(cx))}{x}\\ &\quad+3d^2ex(a+b\arcsin(cx))+de^2x^3(a+b\arcsin(cx))\\ &\quad+\frac{1}{5}e^3x^5(a+b\arcsin(cx))-bcd^3\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)\end{aligned}$$

```
[Out] -1/15*b*e^2*(5*c^2*d+2*e)*(-c^2*x^2+1)^(3/2)/c^5+1/25*b*e^3*(-c^2*x^2+1)^(5
/2)/c^5-d^3*(a+b*arcsin(c*x))/x+3*d^2*e*x*(a+b*arcsin(c*x))+d*e^2*x^3*(a+b*
arcsin(c*x))+1/5*e^3*x^5*(a+b*arcsin(c*x))-b*c*d^3*arctanh((-c^2*x^2+1)^(1/
2))+1/5*b*e*(15*c^4*d^2+5*c^2*d*e+e^2)*(-c^2*x^2+1)^(1/2)/c^5
```

Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used

= {276, 4815, 1813, 1634, 65, 214}

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^2} dx = -\frac{d^3(a+b\arcsin(cx))}{x} + 3d^2ex(a+b\arcsin(cx)) + de^2x^3(a+b\arcsin(cx)) + \frac{1}{5}e^3x^5(a+b\arcsin(cx)) - bcd^3\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right) - \frac{be^2(1-c^2x^2)^{3/2}(5c^2d+2e)}{15c^5} + \frac{be^3(1-c^2x^2)^{5/2}}{25c^5} + \frac{be\sqrt{1-c^2x^2}(15c^4d^2+5c^2de+e^2)}{5c^5}$$

```
[In] Int[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] (b*e*(15*c^4*d^2 + 5*c^2*d*e + e^2)*Sqrt[1 - c^2*x^2])/(5*c^5) - (b*e^2*(5*
c^2*d + 2*e)*(1 - c^2*x^2)^(3/2))/(15*c^5) + (b*e^3*(1 - c^2*x^2)^(5/2))/(2
5*c^5) - (d^3*(a + b*ArcSin[c*x]))/x + 3*d^2*e*x*(a + b*ArcSin[c*x]) + d*e^
2*x^3*(a + b*ArcSin[c*x]) + (e^3*x^5*(a + b*ArcSin[c*x]))/5 - b*c*d^3*ArcTa
nh[Sqrt[1 - c^2*x^2]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1634

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^3(a+b\arcsin(cx))}{x}+3d^2ex(a+b\arcsin(cx))+de^2x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{5}e^3x^5(a+b\arcsin(cx))-(bc)\int\frac{-d^3+3d^2ex^2+de^2x^4+\frac{e^3x^6}{5}}{x\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d^3(a+b\arcsin(cx))}{x}+3d^2ex(a+b\arcsin(cx))+de^2x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{5}e^3x^5(a+b\arcsin(cx))-\frac{1}{2}(bc)\text{Subst}\left(\int\frac{-d^3+3d^2ex+de^2x^2+\frac{e^3x^3}{5}}{x\sqrt{1-c^2x}}\,dx,x,x^2\right) \\
&= -\frac{d^3(a+b\arcsin(cx))}{x}+3d^2ex(a+b\arcsin(cx))+de^2x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{5}e^3x^5(a+b\arcsin(cx))-\frac{1}{2}(bc)\text{Subst}\left(\int\left(\frac{e(15c^4d^2+5c^2de+e^2)}{5c^4\sqrt{1-c^2x}}\right.\right. \\
&\qquad\left.\left.-\frac{d^3}{x\sqrt{1-c^2x}}-\frac{e^2(5c^2d+2e)\sqrt{1-c^2x}}{5c^4}+\frac{e^3(1-c^2x)^{3/2}}{5c^4}\right)\,dx,x,x^2\right) \\
&= \frac{be(15c^4d^2+5c^2de+e^2)\sqrt{1-c^2x^2}}{5c^5}-\frac{be^2(5c^2d+2e)\left(1-c^2x^2\right)^{3/2}}{15c^5} \\
&\quad+\frac{be^3\left(1-c^2x^2\right)^{5/2}}{25c^5}-\frac{d^3(a+b\arcsin(cx))}{x} \\
&\quad+3d^2ex(a+b\arcsin(cx))+de^2x^3(a+b\arcsin(cx)) \\
&\quad+\frac{1}{5}e^3x^5(a+b\arcsin(cx))+\frac{1}{2}\left(bcd^3\right)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)
\end{aligned}$$

$$= \frac{be(15c^4d^2+5c^2de+e^2)\sqrt{1-c^2x^2}}{5c^5} - \frac{be^2(5c^2d+2e)(1-c^2x^2)^{3/2}}{15c^5} + \frac{be^3(1-c^2x^2)^{5/2}}{25c^5} - \frac{d^3(a+b\arcsin(cx))}{x} + 3d^2ex(a+b\arcsin(cx)) + de^2x^3(a+b\arcsin(cx)) + \frac{1}{5}e^3x^5(a+b\arcsin(cx)) - \frac{(bd^3)\,\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{c}$$

$$= \frac{be(15c^4d^2+5c^2de+e^2)\sqrt{1-c^2x^2}}{5c^5} - \frac{be^2(5c^2d+2e)(1-c^2x^2)^{3/2}}{15c^5} + \frac{be^3(1-c^2x^2)^{5/2}}{25c^5} - \frac{d^3(a+b\arcsin(cx))}{x} + 3d^2ex(a+b\arcsin(cx)) + de^2x^3(a+b\arcsin(cx)) + \frac{1}{5}e^3x^5(a+b\arcsin(cx)) - bcd^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 183, normalized size of antiderivative = 0.96

$$\int \frac{(d+ex^2)^3(a+b\arcsin(cx))}{x^2}\,dx$$
$$= -\frac{ad^3}{x} + 3ad^2ex + ade^2x^3 + \frac{1}{5}ae^3x^5 + \frac{be\sqrt{1-c^2x^2}(8e^2+2c^2e(25d+2ex^2)+c^4(225d^2+25dex^2+3e^2x^4))}{75c^5} + \frac{b(-5d^3+15d^2ex^2+5de^2x^4+e^3x^6)\arcsin(cx)}{5x} + bcd^3\log(x) - bcd^3\log\left(1+\sqrt{1-c^2x^2}\right)$$

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^2,x]
```

```
[Out] -((a*d^3)/x) + 3*a*d^2*e*x + a*d*e^2*x^3 + (a*e^3*x^5)/5 + (b*e*Sqrt[1 - c^
2*x^2]*(8*e^2 + 2*c^2*e*(25*d + 2*e*x^2) + c^4*(225*d^2 + 25*d*e*x^2 + 3*e^
2*x^4)))/(75*c^5) + (b*(-5*d^3 + 15*d^2*e*x^2 + 5*d*e^2*x^4 + e^3*x^6)*ArcS
in[c*x])/(5*x) + b*c*d^3*Log[x] - b*c*d^3*Log[1 + Sqrt[1 - c^2*x^2]]
```

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 250, normalized size of antiderivative = 1.32

method	result
parts	$a\left(\frac{e^{3}x^{5}}{5}+d\,e^{2}x^{3}+3d^{2}ex-\frac{d^{3}}{x}\right)+bc\left(\frac{\arcsin(cx)e^{3}x^{5}}{5c}+\frac{\arcsin(cx)d\,e^{2}x^{3}}{c}+\frac{3\arcsin(cx)d^{2}ex}{c}-\frac{\operatorname{arcsi}}{}\right.$
derivativedivides	$c\left(\frac{a\left(3c^{5}d^{2}ex+c^{5}d\,e^{2}x^{3}+\frac{e^{3}c^{5}x^{5}}{5}-\frac{c^{5}d^{3}}{x}\right)}{c^{6}}+\frac{b\left(3\arcsin(cx)c^{5}d^{2}ex+\arcsin(cx)c^{5}d\,e^{2}x^{3}+\frac{\arcsin(cx)e^{3}c^{5}x^{5}}{5}-\frac{\arcsin(cx)}{x}\right.}{}\right.$
default	$c\left(\frac{a\left(3c^{5}d^{2}ex+c^{5}d\,e^{2}x^{3}+\frac{e^{3}c^{5}x^{5}}{5}-\frac{c^{5}d^{3}}{x}\right)}{c^{6}}+\frac{b\left(3\arcsin(cx)c^{5}d^{2}ex+\arcsin(cx)c^{5}d\,e^{2}x^{3}+\frac{\arcsin(cx)e^{3}c^{5}x^{5}}{5}-\frac{\arcsin(cx)}{x}\right.}{}\right.$

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/5*e^3*x^5+d*e^2*x^3+3*d^2*e*x-d^3/x)+b*c*(1/5/c*arcsin(c*x)*e^3*x^5+1/
c*arcsin(c*x)*d*e^2*x^3+3/c*arcsin(c*x)*d^2*e*x-arcsin(c*x)*d^3/c/x-1/5/c^6
*(e^3*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15
*(-c^2*x^2+1)^(1/2))+5*c^6*d^3*arctanh(1/(-c^2*x^2+1)^(1/2))+5*c^2*d*e^2*(-
1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-15*c^4*d^2*e*(-c^2*x
^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 239, normalized size of antiderivative = 1.26

$$\int \frac{(d+ex^2)^3\,(a+b\arcsin(cx))}{x^2}\,dx = \frac{30\,ac^5e^3x^6+150\,ac^5de^2x^4-75\,bc^6d^3x\log\left(\sqrt{-c^2x^2+1}+1\right)+75\,bc^6d^3x\log\left(\sqrt{-c^2x^2+1}-1\right)+450\,ac^5}{}$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] 1/150*(30*a*c^5*e^3*x^6 + 150*a*c^5*d*e^2*x^4 - 75*b*c^6*d^3*x*log(sqrt(-c^
2*x^2 + 1) + 1) + 75*b*c^6*d^3*x*log(sqrt(-c^2*x^2 + 1) - 1) + 450*a*c^5*d^
2*e*x^2 - 150*a*c^5*d^3 + 30*(b*c^5*e^3*x^6 + 5*b*c^5*d*e^2*x^4 + 15*b*c^5*
d^2*e*x^2 - 5*b*c^5*d^3)*arcsin(c*x) + 2*(3*b*c^4*e^3*x^5 + (25*b*c^4*d*e^2
 + 4*b*c^2*e^3)*x^3 + (225*b*c^4*d^2*e + 50*b*c^2*d*e^2 + 8*b*e^3)*x)*sqrt(
-c^2*x^2 + 1))/(c^5*x)
```

Sympy [A] (verification not implemented)

Time = 3.10 (sec) , antiderivative size = 275, normalized size of antiderivative = 1.45

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^2}\,dx$$
$$= -\frac{ad^3}{x} + 3ad^2ex + ade^2x^3 + \frac{ae^3x^5}{5} + bcd^3\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|} > 1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right)$$
$$- bcde^2\left(\begin{cases} -\frac{x^2\sqrt{-c^2x^2+1}}{3c^2} - \frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for } c^2 \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}\right)$$
$$- \frac{bce^3\left(\begin{cases} -\frac{x^4\sqrt{-c^2x^2+1}}{5c^2} - \frac{4x^2\sqrt{-c^2x^2+1}}{15c^4} - \frac{8\sqrt{-c^2x^2+1}}{15c^6} & \text{for } c^2 \neq 0 \\ \frac{x^6}{6} & \text{otherwise} \end{cases}\right)}{5} - \frac{bd^3\operatorname{asin}(cx)}{x}$$
$$+ 3bd^2e\left(\begin{cases} 0 & \text{for } c = 0 \\ x\operatorname{asin}(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise} \end{cases}\right) + bde^2x^3\operatorname{asin}(cx) + \frac{be^3x^5\operatorname{asin}(cx)}{5}$$

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))/x**2,x)
```

```
[Out] -a*d**3/x + 3*a*d**2*e*x + a*d*e**2*x**3 + a*e**3*x**5/5 + b*c*d**3*Piecewi
se((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b*c*
d*e**2*Piecewise((-x**2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 +
 1)/(3*c**4), Ne(c**2, 0)), (x**4/4, True)) - b*c*e**3*Piecewise((-x**4*sqr
t(-c**2*x**2 + 1)/(5*c**2) - 4*x**2*sqrt(-c**2*x**2 + 1)/(15*c**4) - 8*sqrt
(-c**2*x**2 + 1)/(15*c**6), Ne(c**2, 0)), (x**6/6, True))/5 - b*d**3*asin(c
*x)/x + 3*b*d**2*e*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + sqrt(-c**2*x**2
+ 1)/c, True)) + b*d*e**2*x**3*asin(c*x) + b*e**3*x**5*asin(c*x)/5
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 241, normalized size of antiderivative = 1.27

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^2}\,dx$$
$$= \frac{1}{5}ae^3x^5 + ade^2x^3 - \left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|} + \frac{2}{|x|}\right) + \frac{\arcsin(cx)}{x}\right)bd^3 + \frac{1}{3}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bde^2 + \frac{1}{75}\left(15x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be^3 + 3ad^2ex + \frac{3\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^2e}{c} - \frac{ad^3}{x}$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] 1/5*a*e^3*x^5 + a*d*e^2*x^3 - (c*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)
) + arcsin(c*x)/x)*b*d^3 + 1/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x
^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*e^2 + 1/75*(15*x^5*arcsin(c*x) + (3
*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^
2 + 1)/c^6)*c)*b*e^3 + 3*a*d^2*e*x + 3*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1
))*b*d^2*e/c - a*d^3/x
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 10769 vs. 2(174) = 348.

Time = 11.90 (sec) , antiderivative size = 10769, normalized size of antiderivative = 56.68

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^2}\,dx = \text{Too large to display}$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b*c^18*d^3*x^12*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 +
5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1
)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1
) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^12) - 1
/2*a*c^18*d^3*x^12/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sq
rt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*
x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6
```

*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^12) + b*c^17*d^3*x^11
*log(abs(c)*abs(x))/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(s
qrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10
*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^
6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) - b*c^17*d^3*x^1
1*log(sqrt(-c^2*x^2 + 1) + 1)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c
^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7
 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) +
 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) - 3*b*
c^16*d^3*x^10*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*
x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 1
0*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^
3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^10) - 3*a*c^16
*d^3*x^10/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x
^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt
(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(
-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^10) + 5*b*c^15*d^3*x^9*log(abs
(c)*abs(x))/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2
*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sq
rt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqr
t(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) - 5*b*c^15*d^3*x^9*log(sq
rt(-c^2*x^2 + 1) + 1)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/
(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^
10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) - 3*b*c^15*d^2*
e*x^11/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2
+ 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c
^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^
2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^11) + 6*b*c^14*d^2*e*x^10*arcsin(
c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 +
1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2
*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*
x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^10) - 15/2*b*c^14*d^3*x^8*arcsin(c*
x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1)
 + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x
^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^
2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) + 6*a*c^14*d^2*e*x^10/((c^16*x^11/
(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^
12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5
+ 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(s
qrt(-c^2*x^2 + 1) + 1)^10) - 15/2*a*c^14*d^3*x^8/((c^16*x^11/(sqrt(-c^2*x^2
 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-
c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
 1) + 1)^8) + 10*b*c^13*d^3*x^7*log(abs(c)*abs(x))/((c^16*x^11/(sqrt(-c^2*x

^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt
(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/
(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2
 + 1) + 1)^7) - 10*b*c^13*d^3*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^16*x^11/(
sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^1
2*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sq
rt(-c^2*x^2 + 1) + 1)^7) - 2/3*b*c^13*d*e^2*x^11/((c^16*x^11/(sqrt(-c^2*x^2
 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-
c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
 1) + 1)^11) - 9*b*c^13*d^2*e*x^9/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 +
 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) +
1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 +
1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) + 2
4*b*c^12*d^2*e*x^8*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*
c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^
7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1)
+ 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) - 10*b
*c^12*d^3*x^6*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*
x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 1
0*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^
3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 24*a*c^12
*d^2*e*x^8/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*
x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt
(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) - 10*a*c^12*d^3*x^6/((c^16
*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 +
 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) +
 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) +
1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 10*b*c^11*d^3*x^5*log(abs(c)*abs(x))/((c^
16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9
 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1)
 + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1)
+ 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 10*b*c^11*d^3*x^5*log(sqrt(-c^2*x^2 + 1
) + 1)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2
+ 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c
^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^
2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) - 8/75*b*c^11*e^3*x^11/((c^16*
x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 +
10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) +
1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1
))*(sqrt(-c^2*x^2 + 1) + 1)^11) - 10/3*b*c^11*d*e^2*x^9/((c^16*x^11/(sqrt(-
c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/
(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8

*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) - 6*b*c^11*d^2*e*x^7/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^7) + 8*b*c^10*d*e^2*x^8*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) + 36*b*c^10*d^2*e*x^6*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) - 15/2*b*c^10*d^3*x^4*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 8*a*c^10*d*e^2*x^8/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^8) + 36*a*c^10*d^2*e*x^6/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) - 15/2*a*c^10*d^3*x^4/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 5*b*c^9*d^3*x^3*log(abs(c)*abs(x))/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 5*b*c^9*d^3*x^3*log(sqrt(-c^2*x^2 + 1) + 1)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) - 8/15*b*c^9*e^3*x^9/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^9) - 8/3*b*c^9*d*e^2*x^7/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^7) + 6*b*c^9*d^2*e*x^5/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(s

qrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10
*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^
6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) + 16*b*c^8*d*e^2*
x^6*arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(
-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5
/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/
(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 24*b*c^8*d^2*e*x^4*
arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2
*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sq
rt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqr
t(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) - 3*b*c^8*d^3*x^2*arcsin(
c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 +
1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2
*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*
x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + 16*a*c^8*d*e^2*x^6/((c^16*x^11
/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c
^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5
 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(
sqrt(-c^2*x^2 + 1) + 1)^6) + 24*a*c^8*d^2*e*x^4/((c^16*x^11/(sqrt(-c^2*x^2
+ 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c
^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 +
1) + 1)^4) - 3*a*c^8*d^3*x^2/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^
14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7
+ 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) +
1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) + b*c^7*
d^3*x*log(abs(c)*abs(x))/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x
^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10
*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3
 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - b*c^7*d^3*x*
log(sqrt(-c^2*x^2 + 1) + 1)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^1
4*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 +
 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1
)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) - 16/15*b*c
^7*e^3*x^7/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*
x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt
(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^7) + 8/3*b*c^7*d*e^2*x^5/((c^
16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9
 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1)
 + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1)
+ 1))*(sqrt(-c^2*x^2 + 1) + 1)^5) + 9*b*c^7*d^2*e*x^3/((c^16*x^11/(sqrt(-c^
2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(s
qrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x
^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*

x^2 + 1) + 1)^3) - 1/2*b*c^6*d^3*arcsin(c*x)/(c^16*x^11/(sqrt(-c^2*x^2 + 1)
 + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x
^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1)) + 32/5*b*c^6*e^3*x^6*
arcsin(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2
*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sq
rt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqr
t(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 8*b*c^6*d*e^2*x^4*arcsi
n(c*x)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2
+ 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c
^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^
2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 6*b*c^6*d^2*e*x^2*arcsin(c*x
)/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1)
+ 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^
2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2
 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^2) - 1/2*a*c^6*d^3/(c^16*x^11/(sqrt(-c
^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(
sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*
x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1)) + 32/5*a*c
^6*e^3*x^6/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*
x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt
(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^6) + 8*a*c^6*d*e^2*x^4/((c^16
*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 +
 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) +
 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) +
1))*(sqrt(-c^2*x^2 + 1) + 1)^4) + 6*a*c^6*d^2*e*x^2/((c^16*x^11/(sqrt(-c^2*
x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqr
t(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^
2 + 1) + 1)^2) + 16/15*b*c^5*e^3*x^5/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^1
1 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1)
 + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2
 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^5)
+ 10/3*b*c^5*d*e^2*x^3/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9
/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c
^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
 c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)^3) + 3*b*c^5*d^2*
e*x/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1
) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*
x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x
^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1)) + 8/15*b*c^3*e^3*x^3/((c^16*x^11/(s
qrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12
*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqr

```
t(-c^2*x^2 + 1) + 1)^3) + 2/3*b*c^3*d*e^2*x/((c^16*x^11/(sqrt(-c^2*x^2 + 1)
 + 1)^11 + 5*c^14*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x
^2 + 1) + 1)^7 + 10*c^10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3 + c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) +
 1)) + 8/75*b*c*e^3*x/((c^16*x^11/(sqrt(-c^2*x^2 + 1) + 1)^11 + 5*c^14*x^9/
(sqrt(-c^2*x^2 + 1) + 1)^9 + 10*c^12*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 10*c^
10*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + 5*c^8*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3 +
c^6*x/(sqrt(-c^2*x^2 + 1) + 1))*(sqrt(-c^2*x^2 + 1) + 1))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^3}{x^2}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x^2,x)
[Out] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x^2, x)
```

3.621 $\int \frac{(d+ex^2)^3(a+b\arcsin(cx))}{x^3} dx$

Optimal result

Integrand size = 21, antiderivative size = 262

$$\begin{aligned}\int \frac{(d+ex^2)^3(a+b\arcsin(cx))}{x^3}\,dx =& -\frac{bcd^3\sqrt{1-c^2x^2}}{2x}+\frac{3be^2(8c^2d+e)\,x\sqrt{1-c^2x^2}}{32c^3}\\&+\frac{be^3x^3\sqrt{1-c^2x^2}}{16c}-\frac{3be^2(8c^2d+e)\arcsin(cx)}{32c^4}\\&-\frac{3}{2}ibd^2e\arcsin(cx)^2-\frac{d^3(a+b\arcsin(cx))}{2x^2}\\&+\frac{3}{2}de^2x^2(a+b\arcsin(cx))+\frac{1}{4}e^3x^4(a+b\arcsin(cx))\\&+3bd^2e\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right)\\&-3bd^2e\arcsin(cx)\log(x)+3d^2e(a+b\arcsin(cx))\log(x)\\&-\frac{3}{2}ibd^2e\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\end{aligned}$$

```
[Out] -3/32*b*e^2*(8*c^2*d+e)*arcsin(c*x)/c^4-3/2*I*b*d^2*e*arcsin(c*x)^2-1/2*d^3
*(a+b*arcsin(c*x))/x^2+3/2*d*e^2*x^2*(a+b*arcsin(c*x))+1/4*e^3*x^4*(a+b*arc
sin(c*x))+3*b*d^2*e*arcsin(c*x)*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)-3*b*d^2*
e*arcsin(c*x)*ln(x)+3*d^2*e*(a+b*arcsin(c*x))*ln(x)-3/2*I*b*d^2*e*polylog(2
,(I*c*x+(-c^2*x^2+1)^(1/2))^2)-1/2*b*c*d^3*(-c^2*x^2+1)^(1/2)/x+3/32*b*e^2*
(8*c^2*d+e)*x*(-c^2*x^2+1)^(1/2)/c^3+1/16*b*e^3*x^3*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 262, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.762, Rules used = {272, 45, 4815, 12, 6874, 1821, 1598, 470, 327, 222, 2363, 4721, 3798, 2221, 2317, 2438}

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^3} dx = -\frac{d^3(a+b\arcsin(cx))}{2x^2} + 3d^2e\log(x)(a+b\arcsin(cx)) + \frac{3}{2}de^2x^2(a+b\arcsin(cx)) + \frac{1}{4}e^3x^4(a+b\arcsin(cx)) - \frac{3be^2\arcsin(cx)\,(8c^2d+e)}{32c^4} - \frac{3}{2}ibd^2e\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right) - \frac{3}{2}ibd^2e\arcsin(cx)^2 + 3bd^2e\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - 3bd^2e\log(x)\arcsin(cx) - \frac{bcd^3\sqrt{1-c^2x^2}}{2x} + \frac{be^3x^3\sqrt{1-c^2x^2}}{16c} + \frac{3be^2x\sqrt{1-c^2x^2}(8c^2d+e)}{32c^3}$$

```
[In] Int[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] -1/2*(b*c*d^3*Sqrt[1 - c^2*x^2])/x + (3*b*e^2*(8*c^2*d + e)*x*Sqrt[1 - c^2*
x^2])/(32*c^3) + (b*e^3*x^3*Sqrt[1 - c^2*x^2])/(16*c) - (3*b*e^2*(8*c^2*d +
 e)*ArcSin[c*x])/(32*c^4) - ((3*I)/2)*b*d^2*e*ArcSin[c*x]^2 - (d^3*(a + b*A
rcSin[c*x]))/(2*x^2) + (3*d*e^2*x^2*(a + b*ArcSin[c*x]))/2 + (e^3*x^4*(a +
b*ArcSin[c*x]))/4 + 3*b*d^2*e*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] -
3*b*d^2*e*ArcSin[c*x]*Log[x] + 3*d^2*e*(a + b*ArcSin[c*x])*Log[x] - ((3*I)/
2)*b*d^2*e*PolyLog[2, E^((2*I)*ArcSin[c*x])]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1598

```
Int[(u_.)*(x_)^(m_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol]
 :> Int[u*x^(m + n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, m, p, q}, x]
&& IntegerQ[n] && PosQ[q - p]
```

Rule 1821

```
Int[(Pq_)*((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{
Q = PolynomialQuotient[Pq, c*x, x], R = PolynomialRemainder[Pq, c*x, x]}, S
imp[R*(c*x)^(m + 1)*((a + b*x^2)^(p + 1)/(a*c*(m + 1))), x] + Dist[1/(a*c*(
m + 1)), Int[(c*x)^(m + 1)*(a + b*x^2)^p*ExpandToSum[a*c*(m + 1)*Q - b*R*(m
 + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, b, c, p}, x] && PolyQ[Pq, x] && LtQ
[m, -1] && (IntegerQ[2*p] || NeQ[Expon[Pq, x], 1])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2363

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]*((a + b*Log[c*x^n])/Rt[-e, 2]), x
] - Dist[b*(n/Rt[-e, 2]), Int[ArcSin[Rt[-e, 2]*(x/Sqrt[d])]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\text{integral} = -\frac{d^3(a+b\arcsin(cx))}{2x^2} + \frac{3}{2}de^2x^2(a+b\arcsin(cx)) + \frac{1}{4}e^3x^4(a+b\arcsin(cx)) + 3d^2e(a+b\arcsin(cx))\log(x) - (bc)\int \frac{-2d^3+6de^2x^4+e^3x^6+12d^2ex^2\log(x)}{4x^2\sqrt{1-c^2x^2}}\,dx$$

$$=-\frac{d^3(a+b\arcsin(cx))}{2x^2}+\frac{3}{2}de^2x^2(a+b\arcsin(cx))+\frac{1}{4}e^3x^4(a+b\arcsin(cx))+3d^2e(a+b\arcsin(cx))\log(x)-\frac{1}{4}(bc)\int\frac{-2d^3+6de^2x^4+e^3x^6+12d^2ex^2\log(x)}{x^2\sqrt{1-c^2x^2}}\,dx$$

$$=-\frac{d^3(a+b\arcsin(cx))}{2x^2}+\frac{3}{2}de^2x^2(a+b\arcsin(cx))+\frac{1}{4}e^3x^4(a+b\arcsin(cx))+3d^2e(a+b\arcsin(cx))\log(x)-\frac{1}{4}(bc)\int\left(\frac{-2d^3+6de^2x^4+e^3x^6}{x^2\sqrt{1-c^2x^2}}+\frac{12d^2e\log(x)}{\sqrt{1-c^2x^2}}\right)dx$$

$$=-\frac{d^3(a+b\arcsin(cx))}{2x^2}+\frac{3}{2}de^2x^2(a+b\arcsin(cx))+\frac{1}{4}e^3x^4(a+b\arcsin(cx))+3d^2e(a+b\arcsin(cx))\log(x)-\frac{1}{4}(bc)\int\frac{-2d^3+6de^2x^4+e^3x^6}{x^2\sqrt{1-c^2x^2}}\,dx-(3bcd^2e)\int\frac{\log(x)}{\sqrt{1-c^2x^2}}\,dx$$

$$=-\frac{bcd^3\sqrt{1-c^2x^2}}{2x}-\frac{d^3(a+b\arcsin(cx))}{2x^2}+\frac{3}{2}de^2x^2(a+b\arcsin(cx))+\frac{1}{4}e^3x^4(a+b\arcsin(cx))-3bd^2e\arcsin(cx)\log(x)+3d^2e(a+b\arcsin(cx))\log(x)+\frac{1}{4}(bc)\int\frac{-6de^2x^3-e^3x^5}{x\sqrt{1-c^2x^2}}\,dx+(3bd^2e)\int\frac{\arcsin(cx)}{x}\,dx$$

$$=-\frac{bcd^3\sqrt{1-c^2x^2}}{2x}-\frac{d^3(a+b\arcsin(cx))}{2x^2}+\frac{3}{2}de^2x^2(a+b\arcsin(cx))+\frac{1}{4}e^3x^4(a+b\arcsin(cx))-3bd^2e\arcsin(cx)\log(x)+3d^2e(a+b\arcsin(cx))\log(x)+\frac{1}{4}(bc)\int\frac{x^2(-6de^2-e^3x^2)}{\sqrt{1-c^2x^2}}\,dx+(3bd^2e)\,\text{Subst}\left(\int x\cot(x)\,dx,x,\arcsin(cx)\right)$$

$$=-\frac{bcd^3\sqrt{1-c^2x^2}}{2x}+\frac{be^3x^3\sqrt{1-c^2x^2}}{16c}-\frac{3}{2}ibd^2e\arcsin(cx)^2-\frac{d^3(a+b\arcsin(cx))}{2x^2}+\frac{3}{2}de^2x^2(a+b\arcsin(cx))+\frac{1}{4}e^3x^4(a+b\arcsin(cx))-3bd^2e\arcsin(cx)\log(x)+3d^2e(a+b\arcsin(cx))\log(x)-(6ibd^2e)\,\text{Subst}\left(\int\frac{e^{2ix}x}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right)-\frac{(3be^2(8c^2d+e))\int\frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{16c}$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x} + \frac{3be^2(8c^2d+e)\,x\sqrt{1-c^2x^2}}{32c^3} + \frac{be^3x^3\sqrt{1-c^2x^2}}{16c} - \frac{3}{2}ibd^2e\arcsin(cx)^2 - \frac{d^3(a+b\arcsin(cx))}{2x^2} + \frac{3}{2}de^2x^2(a+b\arcsin(cx)) + \frac{1}{4}e^3x^4(a+b\arcsin(cx)) + 3bd^2e\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - 3bd^2e\arcsin(cx)\log(x) + 3d^2e(a+b\arcsin(cx))\log(x) - \left(3bd^2e\right)\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right) - \frac{(3be^2(8c^2d+e))\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{32c^3}$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x} + \frac{3be^2(8c^2d+e)\,x\sqrt{1-c^2x^2}}{32c^3} + \frac{be^3x^3\sqrt{1-c^2x^2}}{16c} - \frac{3be^2(8c^2d+e)\arcsin(cx)}{32c^4} - \frac{3}{2}ibd^2e\arcsin(cx)^2 - \frac{d^3(a+b\arcsin(cx))}{2x^2} + \frac{3}{2}de^2x^2(a+b\arcsin(cx)) + \frac{1}{4}e^3x^4(a+b\arcsin(cx)) + 3bd^2e\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - 3bd^2e\arcsin(cx)\log(x) + 3d^2e(a+b\arcsin(cx))\log(x) + \frac{1}{2}\left(3ibd^2e\right)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)$$

$$= -\frac{bcd^3\sqrt{1-c^2x^2}}{2x} + \frac{3be^2(8c^2d+e)\,x\sqrt{1-c^2x^2}}{32c^3} + \frac{be^3x^3\sqrt{1-c^2x^2}}{16c} - \frac{3be^2(8c^2d+e)\arcsin(cx)}{32c^4} - \frac{3}{2}ibd^2e\arcsin(cx)^2 - \frac{d^3(a+b\arcsin(cx))}{2x^2} + \frac{3}{2}de^2x^2(a+b\arcsin(cx)) + \frac{1}{4}e^3x^4(a+b\arcsin(cx)) + 3bd^2e\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right) - 3bd^2e\arcsin(cx)\log(x) + 3d^2e(a+b\arcsin(cx))\log(x) - \frac{3}{2}ibd^2e\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)$$

Mathematica [A] (verified)

Time = 0.32 (sec) , antiderivative size = 262, normalized size of antiderivative = 1.00

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^3}\,dx$$
$$= \frac{1}{32}\left(-\frac{16ad^3}{x^2}+48ade^2x^2+8ae^3x^4-\frac{16bd^3\left(cx\sqrt{1-c^2x^2}+\arcsin(cx)\right)}{x^2}\right.$$
$$+\frac{be^3\left(cx\sqrt{1-c^2x^2}(3+2c^2x^2)+8c^4x^4\arcsin(cx)-6\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{c^4}$$
$$+\frac{24bde^2\left(cx\sqrt{1-c^2x^2}+2c^2x^2\arcsin(cx)-2\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right)}{c^2}+96ad^2e\log(x)$$
$$\left.+96bd^2e\left(\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right)-\frac{1}{2}i\left(\arcsin(cx)^2+\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\right)\right)\right)$$

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^3,x]
```

```
[Out] ((-16*a*d^3)/x^2 + 48*a*d*e^2*x^2 + 8*a*e^3*x^4 - (16*b*d^3*(c*x*Sqrt[1 - c
^2*x^2] + ArcSin[c*x]))/x^2 + (b*e^3*(c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2)
 + 8*c^4*x^4*ArcSin[c*x] - 6*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])]))/c^4 +
 (24*b*d*e^2*(c*x*Sqrt[1 - c^2*x^2] + 2*c^2*x^2*ArcSin[c*x] - 2*ArcTan[(c*x
)/(-1 + Sqrt[1 - c^2*x^2])]))/c^2 + 96*a*d^2*e*Log[x] + 96*b*d^2*e*(ArcSin[
c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] - (I/2)*(ArcSin[c*x]^2 + PolyLog[2, E^(
(2*I)*ArcSin[c*x])])))/32
```

Maple [A] (verified)

Time = 0.62 (sec) , antiderivative size = 357, normalized size of antiderivative = 1.36

method	result
parts	$a\left(\frac{e^3x^4}{4}+\frac{3d\,e^2x^2}{2}-\frac{d^3}{2x^2}+3d^2e\ln(x)\right)-3ib\,d^2e\,\text{polylog}\left(2,icx+\sqrt{-c^2x^2+1}\right)-\frac{bc\,d^3\sqrt{-c^2}}{2x}$
derivativedivides	$c^2\left(\frac{a\left(\frac{3c^4d\,e^2x^2}{2}+\frac{e^3c^4x^4}{4}-\frac{c^4d^3}{2x^2}+3c^4d^2e\ln(cx)\right)}{c^6}-\frac{3ib\,d^2e\arcsin(cx)^2}{2c^2}-\frac{3ib\,\text{polylog}\left(2,-icx-\sqrt{-c^2x^2+1}\right)d^2e}{c^2}-b\right.$
default	$c^2\left(\frac{a\left(\frac{3c^4d\,e^2x^2}{2}+\frac{e^3c^4x^4}{4}-\frac{c^4d^3}{2x^2}+3c^4d^2e\ln(cx)\right)}{c^6}-\frac{3ib\,d^2e\arcsin(cx)^2}{2c^2}-\frac{3ib\,\text{polylog}\left(2,-icx-\sqrt{-c^2x^2+1}\right)d^2e}{c^2}-b\right.$

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/4*e^3*x^4+3/2*d*e^2*x^2-1/2*d^3/x^2+3*d^2*e*ln(x))-3*I*b*d^2*e*polylog
(2,I*c*x+(-c^2*x^2+1)^(1/2))-1/2*b*c*d^3*(-c^2*x^2+1)^(1/2)/x-1/2*b*d^3/x^2
```

```
*arcsin(c*x)+1/32*b/c^4*arcsin(c*x)*e^3*cos(4*arcsin(c*x))+1/4*b/c^2*e^3*ar
csin(c*x)*x^2-3/4*b/c^2*e^2*d*arcsin(c*x)+3*b*d^2*e*arcsin(c*x)*ln(1+I*c*x+
(-c^2*x^2+1)^(1/2))-3/2*I*b*d^2*e*arcsin(c*x)^2-3*I*b*d^2*e*polylog(2,-I*c*
x-(-c^2*x^2+1)^(1/2))+1/2*I*b*c^2*d^3+3*b*d^2*e*arcsin(c*x)*ln(1-I*c*x-(-c^
2*x^2+1)^(1/2))+3/2*b*e^2*arcsin(c*x)*x^2*d+1/8*b/c^3*e^3*(-c^2*x^2+1)^(1/2
)*x-1/128*b/c^4*e^3*sin(4*arcsin(c*x))-1/8*b/c^4*e^3*arcsin(c*x)+3/4*b/c*e^
2*(-c^2*x^2+1)^(1/2)*x*d
```

Fricas [F]

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^3} \, dx = \int \frac{(ex^2+d)^3(b\arcsin(cx)+a)}{x^3} \, dx$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="fricas")
[Out] integral((a*e^3*x^6 + 3*a*d*e^2*x^4 + 3*a*d^2*e*x^2 + a*d^3 + (b*e^3*x^6 +
3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arcsin(c*x))/x^3, x)
```

Sympy [F]

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^3} \, dx = \int \frac{(a+b\operatorname{asin}(cx))(d+ex^2)^3}{x^3} \, dx$$

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))/x**3,x)
[Out] Integral((a + b*asin(c*x))*(d + e*x**2)**3/x**3, x)
```

Maxima [F]

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^3} \, dx = \int \frac{(ex^2+d)^3(b\arcsin(cx)+a)}{x^3} \, dx$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="maxima")
[Out] 1/4*a*e^3*x^4 + 3/2*a*d*e^2*x^2 - 1/2*b*d^3*(sqrt(-c^2*x^2 + 1)*c/x + arcsi
n(c*x)/x^2) + 3*a*d^2*e*log(x) - 1/2*a*d^3/x^2 + integrate((b*e^3*x^4 + 3*b
*d*e^2*x^2 + 3*b*d^2*e)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/x, x)
```

Giac [F]

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(ex^2+d)^3(b\arcsin(cx)+a)}{x^3}\,dx$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^3,x, algorithm="giac")
[Out] integrate((e*x^2 + d)^3*(b*arcsin(c*x) + a)/x^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(e\,x^2+d)^3}{x^3}\,dx$$

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x^3,x)
[Out] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x^3, x)
```

3.622 $\int \frac{(d+ex^2)^3(a+b\arcsin(cx))}{x^4}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 186

$$\int \frac{(d+ex^2)^3(a+b\arcsin(cx))}{x^4}\,dx = \frac{be^2(9c^2d+e)\sqrt{1-c^2x^2}}{3c^3} - \frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} - \frac{be^3(1-c^2x^2)^{3/2}}{9c^3} - \frac{d^3(a+b\arcsin(cx))}{3x^3} - \frac{3d^2e(a+b\arcsin(cx))}{x} + 3de^2x(a+b\arcsin(cx)) + \frac{1}{3}e^3x^3(a+b\arcsin(cx)) - \frac{1}{6}bcd^2(c^2d+18e)\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

```
[Out] -1/9*b*e^3*(-c^2*x^2+1)^(3/2)/c^3-1/3*d^3*(a+b*arcsin(c*x))/x^3-3*d^2*e*(a+
b*arcsin(c*x))/x+3*d*e^2*x*(a+b*arcsin(c*x))+1/3*e^3*x^3*(a+b*arcsin(c*x))-
1/6*b*c*d^2*(c^2*d+18*e)*arctanh((-c^2*x^2+1)^(1/2))+1/3*b*e^2*(9*c^2*d+e)*
(-c^2*x^2+1)^(1/2)/c^3-1/6*b*c*d^3*(-c^2*x^2+1)^(1/2)/x^2
```

Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used

$= \{276, 4815, 12, 1813, 1635, 911, 1167, 214\}$

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^4} dx = -\frac{d^3(a+b\arcsin(cx))}{3x^3} - \frac{3d^2e(a+b\arcsin(cx))}{x} + 3de^2x(a+b\arcsin(cx)) + \frac{1}{3}e^3x^3(a+b\arcsin(cx)) - \frac{1}{6}bcd^2\text{arctanh}\left(\sqrt{1-c^2x^2}\right)(c^2d+18e) - \frac{bcd^3\sqrt{1-c^2x^2}}{6x^2} + \frac{be^2\sqrt{1-c^2x^2}(9c^2d+e)}{3c^3} - \frac{be^3(1-c^2x^2)^{3/2}}{9c^3}$$

```
[In] Int[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] (b*e^2*(9*c^2*d + e)*Sqrt[1 - c^2*x^2])/(3*c^3) - (b*c*d^3*Sqrt[1 - c^2*x^2
])/(6*x^2) - (b*e^3*(1 - c^2*x^2)^(3/2))/(9*c^3) - (d^3*(a + b*ArcSin[c*x])
)/(3*x^3) - (3*d^2*e*(a + b*ArcSin[c*x]))/x + 3*d*e^2*x*(a + b*ArcSin[c*x])
 + (e^3*x^3*(a + b*ArcSin[c*x]))/3 - (b*c*d^2*(c^2*d + 18*e)*ArcTanh[Sqrt[1
 - c^2*x^2]])/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 911

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + g*(x^q/e))^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - (2*c*d - b*e)*(x^q/e^2) + c*(x^(2*q)/e^2))^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1167

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1635

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :
> With[{Qx = PolynomialQuotient[Px, a + b*x, x], R = PolynomialRemainder[Px
, a + b*x, x]}, Simp[R*(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((m + 1)*(b*c -
 a*d))), x] + Dist[1/((m + 1)*(b*c - a*d)), Int[(a + b*x)^(m + 1)*(c + d*x)
^n*ExpandToSum[(m + 1)*(b*c - a*d)*Qx - d*R*(m + n + 2), x], x], x]] /; Fre
eQ[{a, b, c, d, n}, x] && PolyQ[Px, x] && ILtQ[m, -1] && GtQ[Expon[Px, x],
2]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{d^3(a+b\arcsin(cx))}{3x^3}-\frac{3d^2e(a+b\arcsin(cx))}{x}+3de^2x(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}e^3x^3(a+b\arcsin(cx))-(bc)\int\frac{-d^3-9d^2ex^2+9de^2x^4+e^3x^6}{3x^3\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d^3(a+b\arcsin(cx))}{3x^3}-\frac{3d^2e(a+b\arcsin(cx))}{x}+3de^2x(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}e^3x^3(a+b\arcsin(cx))-\frac{1}{3}(bc)\int\frac{-d^3-9d^2ex^2+9de^2x^4+e^3x^6}{x^3\sqrt{1-c^2x^2}}\,dx \\
&= -\frac{d^3(a+b\arcsin(cx))}{3x^3}-\frac{3d^2e(a+b\arcsin(cx))}{x}+3de^2x(a+b\arcsin(cx))+\frac{1}{3}e^3x^3(a \\
&\quad+b\arcsin(cx))-\frac{1}{6}(bc)\text{Subst}\left(\int\frac{-d^3-9d^2ex+9de^2x^2+e^3x^3}{x^2\sqrt{1-c^2x}}\,dx,x,x^2\right)
\end{aligned}$$

$$=-\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}-\frac{d^3(a+b\arcsin(cx))}{3x^3}-\frac{3d^2e(a+b\arcsin(cx))}{x}+3de^2x(a+b\arcsin(cx))+\frac{1}{3}e^3x^3(a+b\arcsin(cx))+\frac{1}{6}(bc)\text{Subst}\left(\int\frac{\frac{1}{2}d^2(c^2d+18e)-9de^2x-e^3x^2}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)$$

$$=-\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}-\frac{d^3(a+b\arcsin(cx))}{3x^3}-\frac{3d^2e(a+b\arcsin(cx))}{x}+3de^2x(a+b\arcsin(cx))+\frac{1}{3}e^3x^3(a+b\arcsin(cx))-\frac{b\text{Subst}\left(\int\frac{\frac{-9c^2de^2-e^3+\frac{1}{2}c^4d^2\left(c^2d+18e\right)}{c^4}-\frac{\left(-9c^2de^2-2e^3\right)x^2}{c^4}-\frac{e^3x^4}{c^4}}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{3c}$$

$$=-\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}-\frac{d^3(a+b\arcsin(cx))}{3x^3}-\frac{3d^2e(a+b\arcsin(cx))}{x}+3de^2x(a+b\arcsin(cx))+\frac{1}{3}e^3x^3(a+b\arcsin(cx))-\frac{b\text{Subst}\left(\int\left(-e^2\left(9d+\frac{e}{c^2}\right)+\frac{e^3x^2}{c^2}+\frac{c^2d^3+18d^2e}{2\left(\frac{1}{c^2}-\frac{x^2}{c^2}\right)}\right)dx,x,\sqrt{1-c^2x^2}\right)}{3c}$$

$$=\frac{be^2(9c^2d+e)\sqrt{1-c^2x^2}}{3c^3}-\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}-\frac{be^3(1-c^2x^2)^{3/2}}{9c^3}-\frac{d^3(a+b\arcsin(cx))}{3x^3}-\frac{3d^2e(a+b\arcsin(cx))}{x}+3de^2x(a+b\arcsin(cx))+\frac{1}{3}e^3x^3(a+b\arcsin(cx))-\frac{(bd^2(c^2d+18e))\text{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{6c}$$

$$=\frac{be^2(9c^2d+e)\sqrt{1-c^2x^2}}{3c^3}-\frac{bcd^3\sqrt{1-c^2x^2}}{6x^2}-\frac{be^3(1-c^2x^2)^{3/2}}{9c^3}-\frac{d^3(a+b\arcsin(cx))}{3x^3}-\frac{3d^2e(a+b\arcsin(cx))}{x}+3de^2x(a+b\arcsin(cx))+\frac{1}{3}e^3x^3(a+b\arcsin(cx))-\frac{1}{6}bcd^2\left(c^2d+18e\right)\text{arctanh}\left(\sqrt{1-c^2x^2}\right)$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.04

$$\int \frac{(d+ex^2)^3(a+b\arcsin(cx))}{x^4}\,dx = \frac{1}{6}\left(-\frac{2ad^3}{x^3}-\frac{18ad^2e}{x}+18ade^2x+2ae^3x^3+\frac{b\sqrt{1-c^2x^2}(-3c^4d^3+4e^3x^2+2c^2e^2x^2(27d+ex^2))}{3c^3x^2}+\frac{2b(-d^3-9d^2ex^2+9de^2x^4+e^3x^6)\arcsin(cx)}{x^3}+bcd^2(c^2d+18e)\log(x)-bcd^2(c^2d+18e)\log\left(1+\sqrt{1-c^2x^2}\right)\right)$$

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcSin[c*x]))/x^4,x]
```

```
[Out] ((-2*a*d^3)/x^3 - (18*a*d^2*e)/x + 18*a*d*e^2*x + 2*a*e^3*x^3 + (b*Sqrt[1 -
 c^2*x^2]*(-3*c^4*d^3 + 4*e^3*x^2 + 2*c^2*e^2*x^2*(27*d + e*x^2)))/(3*c^3*x
^2) + (2*b*(-d^3 - 9*d^2*e*x^2 + 9*d*e^2*x^4 + e^3*x^6)*ArcSin[c*x])/x^3 +
b*c*d^2*(c^2*d + 18*e)*Log[x] - b*c*d^2*(c^2*d + 18*e)*Log[1 + Sqrt[1 - c^2
*x^2]])/6
```

Maple [A] (verified)

Time = 0.22 (sec) , antiderivative size = 235, normalized size of antiderivative = 1.26

method	result
parts	$a\left(\frac{e^3x^3}{3}+3d\,e^2x-\frac{3d^2e}{x}-\frac{d^3}{3x^3}\right)+b\,c^3\left(\frac{\arcsin(cx)e^3x^3}{3c^3}+\frac{3\arcsin(cx)xd\,e^2}{c^3}-\frac{3\arcsin(cx)d^2e}{c^3x}-\frac{\arcsin(}{3c^3}\right.$
derivativedivides	$c^3\left(\frac{a\left(3c^3d\,e^2x+\frac{e^3c^3x^3}{3}-\frac{c^3d^3}{3x^3}-\frac{3c^3d^2e}{x}\right)}{c^6}+\frac{b\left(3\arcsin(cx)c^3d\,e^2x+\frac{\arcsin(cx)e^3c^3x^3}{3}-\frac{\arcsin(cx)c^3d^3}{3x^3}-\frac{3\arcsin(cx)c^3d^2e}{x}\right.}{}\right.$
default	$c^3\left(\frac{a\left(3c^3d\,e^2x+\frac{e^3c^3x^3}{3}-\frac{c^3d^3}{3x^3}-\frac{3c^3d^2e}{x}\right)}{c^6}+\frac{b\left(3\arcsin(cx)c^3d\,e^2x+\frac{\arcsin(cx)e^3c^3x^3}{3}-\frac{\arcsin(cx)c^3d^3}{3x^3}-\frac{3\arcsin(cx)c^3d^2e}{x}\right.}{}\right.$

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/3*e^3*x^3+3*d*e^2*x-3*d^2*e/x-1/3*d^3/x^3)+b*c^3*(1/3/c^3*arcsin(c*x)*
e^3*x^3+3/c^3*arcsin(c*x)*x*d*e^2-3/c^3*arcsin(c*x)*d^2*e/x-1/3*arcsin(c*x)
*d^3/c^3/x^3-1/3/c^6*(e^3*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)
^(1/2))-c^6*d^3*(-1/2/c^2/x^2*(-c^2*x^2+1)^(1/2)-1/2*arctanh(1/(-c^2*x^2+1)
^(1/2)))-9*c^2*d*e^2*(-c^2*x^2+1)^(1/2)+9*c^4*d^2*e*arctanh(1/(-c^2*x^2+1)^
(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.35 (sec) , antiderivative size = 246, normalized size of antiderivative = 1.32

$$\int \frac{(d+ex^2)^3\,(a+b\arcsin(cx))}{x^4}\,dx$$
$$=\frac{12\,ac^3e^3x^6+108\,ac^3de^2x^4-108\,ac^3d^2ex^2-12\,ac^3d^3-3\,(bc^6d^3+18\,bc^4d^2e)x^3\log\left(\sqrt{-c^2x^2+1}+1\right)+3\,(}{}$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] 1/36*(12*a*c^3*e^3*x^6 + 108*a*c^3*d*e^2*x^4 - 108*a*c^3*d^2*e*x^2 - 12*a*c
^3*d^3 - 3*(b*c^6*d^3 + 18*b*c^4*d^2*e)*x^3*log(sqrt(-c^2*x^2 + 1) + 1) + 3
*(b*c^6*d^3 + 18*b*c^4*d^2*e)*x^3*log(sqrt(-c^2*x^2 + 1) - 1) + 12*(b*c^3*e
^3*x^6 + 9*b*c^3*d*e^2*x^4 - 9*b*c^3*d^2*e*x^2 - b*c^3*d^3)*arcsin(c*x) + 2
*(2*b*c^2*e^3*x^5 - 3*b*c^4*d^3*x + 2*(27*b*c^2*d*e^2 + 2*b*e^3)*x^3)*sqrt(
-c^2*x^2 + 1))/(c^3*x^3)
```

Sympy [A] (verification not implemented)

Time = 3.94 (sec) , antiderivative size = 311, normalized size of antiderivative = 1.67

$$\int \frac{(d+ex^2)^3(a+b\arcsin(cx))}{x^4}\,dx$$
$$= -\frac{ad^3}{3x^3} - \frac{3ad^2e}{x} + 3ade^2x + \frac{ae^3x^3}{3} + \frac{bcd^3\left(\begin{cases} -\frac{c^2\operatorname{acosh}\left(\frac{1}{cx}\right)}{2} + \frac{c}{2x\sqrt{-1+\frac{1}{c^2x^2}}} - \frac{1}{2cx^3\sqrt{-1+\frac{1}{c^2x^2}}} & \text{for } \frac{1}{|c^2x^2|} > 1 \\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx}\right)}{2} - \frac{ic\sqrt{1-\frac{1}{c^2x^2}}}{2x} & \text{otherwise} \end{cases}\right)}{3} + 3bcd^2e\left(\begin{cases} -\operatorname{acosh}\left(\frac{1}{cx}\right) & \text{for } \frac{1}{|c^2x^2|} > 1 \\ i\operatorname{asin}\left(\frac{1}{cx}\right) & \text{otherwise} \end{cases}\right) - \frac{bce^3\left(\begin{cases} -\frac{x^2\sqrt{-c^2x^2+1}}{3c^2} - \frac{2\sqrt{-c^2x^2+1}}{3c^4} & \text{for } c^2 \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}\right)}{3} - \frac{bd^3\operatorname{asin}(cx)}{3x^3} - \frac{3bd^2e\operatorname{asin}(cx)}{x} + 3bde^2\left(\begin{cases} 0 & \text{for } c = 0 \\ x\operatorname{asin}(cx) + \frac{\sqrt{-c^2x^2+1}}{c} & \text{otherwise} \end{cases}\right) + \frac{be^3x^3\operatorname{asin}(cx)}{3}$$

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))/x**4,x)
```

```
[Out] -a*d**3/(3*x**3) - 3*a*d**2*e/x + 3*a*d*e**2*x + a*e**3*x**3/3 + b*c*d**3*P
iecewise((-c**2*acosh(1/(c*x))/2 + c/(2*x*sqrt(-1 + 1/(c**2*x**2))) - 1/(2*
c*x**3*sqrt(-1 + 1/(c**2*x**2))), 1/Abs(c**2*x**2) > 1), (I*c**2*asin(1/(c*
x))/2 - I*c*sqrt(1 - 1/(c**2*x**2))/(2*x), True))/3 + 3*b*c*d**2*e*Piecewis
e((-acosh(1/(c*x)), 1/Abs(c**2*x**2) > 1), (I*asin(1/(c*x)), True)) - b*c*e
**3*Piecewise((-x**2*sqrt(-c**2*x**2 + 1)/(3*c**2) - 2*sqrt(-c**2*x**2 + 1)
/(3*c**4), Ne(c**2, 0)), (x**4/4, True))/3 - b*d**3*asin(c*x)/(3*x**3) - 3*
b*d**2*e*asin(c*x)/x + 3*b*d*e**2*Piecewise((0, Eq(c, 0)), (x*asin(c*x) + s
qrt(-c**2*x**2 + 1)/c, True)) + b*e**3*x**3*asin(c*x)/3
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 231, normalized size of antiderivative = 1.24

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^4} dx$$
$$= \frac{1}{3} ae^3x^3 - \frac{1}{6}\left(\left(\left(c^2\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\sqrt{-c^2x^2+1}}{x^2}\right)c+\frac{2\arcsin(cx)}{x^3}\right)bd^3$$
$$- 3\left(c\log\left(\frac{2\sqrt{-c^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{\arcsin(cx)}{x}\right)bd^2e$$
$$+ \frac{1}{9}\left(3x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be^3$$
$$+ 3ade^2x + \frac{3\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)bde^2}{c} - \frac{3ad^2e}{x} - \frac{ad^3}{3x^3}$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] 1/3*a*e^3*x^3 - 1/6*((c^2*log(2*sqrt(-c^2*x^2 + 1)/abs(x) + 2/abs(x)) + sqr
t(-c^2*x^2 + 1)/x^2)*c + 2*arcsin(c*x)/x^3)*b*d^3 - 3*(c*log(2*sqrt(-c^2*x^
2 + 1)/abs(x) + 2/abs(x)) + arcsin(c*x)/x)*b*d^2*e + 1/9*(3*x^3*arcsin(c*x)
 + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e^3 + 3*a*d
*e^2*x + 3*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d*e^2/c - 3*a*d^2*e/x -
 1/3*a*d^3/x^3
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 7971 vs. 2(166) = 332.

Time = 8.38 (sec) , antiderivative size = 7971, normalized size of antiderivative = 42.85

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^4} dx = \text{Too large to display}$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))/x^4,x, algorithm="giac")
```

```
[Out] -1/24*b*c^18*d^3*x^12*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3
*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5
 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^12) - 1/24*
a*c^18*d^3*x^12/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c
^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-
c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^12) + 1/24*b*c^17*d^3*x^11/((
c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7
```

+ 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^11) - 1/4*b*c^16*d^3*x^10*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^10) - 1/4*a*c^16*d^3*x^10/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^10) + 1/6*b*c^15*d^3*x^9*log(abs(c)*abs(x))/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^9) - 1/6*b*c^15*d^3*x^9*log(sqrt(-c^2*x^2 + 1) + 1)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^9) + 1/8*b*c^15*d^3*x^9/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^9) - 3/2*b*c^14*d^2*e*x^10*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^10) - 5/8*b*c^14*d^3*x^8*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) - 3/2*a*c^14*d^2*e*x^10/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^10) - 5/8*a*c^14*d^3*x^8/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) + 3*b*c^13*d^2*e*x^9*log(abs(c)*abs(x))/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^9) + 1/2*b*c^13*d^3*x^7*log(abs(c)*abs(x))/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^7) - 3*b*c^13*d^2*e*x^9*log(sqrt(-c^2*x^2 + 1) + 1)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^9) - 1/2*b*c^13*d^3*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^7) + 1/12*b*c^13*d^3*x^7/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^7) - 6*b*c^12*d^2*e*x^8*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) - 5/6*

b*c^12*d^3*x^6*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x
^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*
x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) - 6*a*c^12*d^2*
e*x^8/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1
) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 +
1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) - 5/6*a*c^12*d^3*x^6/((c^12*x^9/(sqr
t(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/
(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2
*x^2 + 1) + 1)^6) + 9*b*c^11*d^2*e*x^7*log(abs(c)*abs(x))/((c^12*x^9/(sqrt(
-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(s
qrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x
^2 + 1) + 1)^7) + 1/2*b*c^11*d^3*x^5*log(abs(c)*abs(x))/((c^12*x^9/(sqrt(-c
^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2
 + 1) + 1)^5) - 9*b*c^11*d^2*e*x^7*log(sqrt(-c^2*x^2 + 1) + 1)/((c^12*x^9/(
sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x
^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-
c^2*x^2 + 1) + 1)^7) - 1/2*b*c^11*d^3*x^5*log(sqrt(-c^2*x^2 + 1) + 1)/((c^1
2*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 +
3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*
(sqrt(-c^2*x^2 + 1) + 1)^5) - 3*b*c^11*d*e^2*x^9/((c^12*x^9/(sqrt(-c^2*x^2
+ 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*
x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) +
 1)^9) - 1/12*b*c^11*d^3*x^5/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10
*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^
6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) + 6*b*c^10*d*
e^2*x^8*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqr
t(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^8) - 9*b*c^10*d^2*e*x^6*a
rcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^
2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x
^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) - 5/8*b*c^10*d^3*x^4*arcsin(c*x
)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) +
1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) +
 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) + 6*a*c^10*d*e^2*x^8/((c^12*x^9/(sqrt(-c
^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2
 + 1) + 1)^8) - 9*a*c^10*d^2*e*x^6/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 +
3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^
5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) - 5/8*a
*c^10*d^3*x^4/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2
*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^
2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) + 9*b*c^9*d^2*e*x^5*log(abs(
c)*abs(x))/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^
2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x

^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) + 1/6*b*c^9*d^3*x^3*log(abs(c)*
abs(x))/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 +
 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2
+ 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) - 9*b*c^9*d^2*e*x^5*log(sqrt(-c^2*
x^2 + 1) + 1)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2
*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^
2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) - 1/6*b*c^9*d^3*x^3*log(sqrt
(-c^2*x^2 + 1) + 1)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqr
t(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) - 2/9*b*c^9*e^3*x^9/((
c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7
 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^
3)*(sqrt(-c^2*x^2 + 1) + 1)^9) - 3*b*c^9*d*e^2*x^7/((c^12*x^9/(sqrt(-c^2*x^
2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^
2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1)
 + 1)^7) - 1/8*b*c^9*d^3*x^3/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10
*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^
6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) + 12*b*c^8*d*
e^2*x^6*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqr
t(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sq
rt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) - 6*b*c^8*d^2*e*x^4*ar
csin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2
 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^
2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) - 1/4*b*c^8*d^3*x^2*arcsin(c*x)/
((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)
^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1
)^3)*(sqrt(-c^2*x^2 + 1) + 1)^2) + 12*a*c^8*d*e^2*x^6/((c^12*x^9/(sqrt(-c^2
*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(
-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 +
 1) + 1)^6) - 6*a*c^8*d^2*e*x^4/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c
^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
 c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) - 1/4*a*c^
8*d^3*x^2/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2
 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^
2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^2) + 3*b*c^7*d^2*e*x^3*log(abs(c)*a
bs(x))/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 +
1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 +
 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) - 3*b*c^7*d^2*e*x^3*log(sqrt(-c^2*x
^2 + 1) + 1)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*
x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2
x^2 + 1) + 1)^3)(sqrt(-c^2*x^2 + 1) + 1)^3) - 2/3*b*c^7*e^3*x^7/((c^12*x^
9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^
8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqr
t(-c^2*x^2 + 1) + 1)^7) + 3*b*c^7*d*e^2*x^5/((c^12*x^9/(sqrt(-c^2*x^2 + 1)
+ 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 +

```
 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5
) - 1/24*b*c^7*d^3*x/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sq
rt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(s
qrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)) - 1/24*b*c^6*d^3*arcsin
(c*x)/(c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1)
 + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1
) + 1)^3) + 8/3*b*c^6*e^3*x^6*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) +
1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1
) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6)
+ 6*b*c^6*d*e^2*x^4*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c
^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 +
 c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) - 3/2*b*c^
6*d^2*e*x^2*arcsin(c*x)/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/
(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3
/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^2) - 1/24*a*c^6*d^3/(
c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7
 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^
3) + 8/3*a*c^6*e^3*x^6/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(
sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/
(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^6) + 6*a*c^6*d*e^2*x^4
/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1
)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) +
1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^4) - 3/2*a*c^6*d^2*e*x^2/((c^12*x^9/(sqrt(-c
^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqr
t(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2
 + 1) + 1)^2) + 2/3*b*c^5*e^3*x^5/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3
*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5
 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^5) + 3*b*c^
5*d*e^2*x^3/((c^12*x^9/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x
^2 + 1) + 1)^7 + 3*c^8*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*
x^2 + 1) + 1)^3)*(sqrt(-c^2*x^2 + 1) + 1)^3) + 2/9*b*c^3*e^3*x^3/((c^12*x^9
/(sqrt(-c^2*x^2 + 1) + 1)^9 + 3*c^10*x^7/(sqrt(-c^2*x^2 + 1) + 1)^7 + 3*c^8
*x^5/(sqrt(-c^2*x^2 + 1) + 1)^5 + c^6*x^3/(sqrt(-c^2*x^2 + 1) + 1)^3)*(sqrt
(-c^2*x^2 + 1) + 1)^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex^2)^3 (a+b\arcsin(cx))}{x^4} \, dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^3}{x^4} \, dx$$

```
[In] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x^4,x)
[Out] int(((a + b*asin(c*x))*(d + e*x^2)^3)/x^4, x)
```

3.623 $\int (d+ex^2)^4 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 18, antiderivative size = 317

$$\begin{aligned}\int (d+ex^2)^4 (a+b\arcsin(cx))\,dx &= \frac{b(315c^8d^4+420c^6d^3e+378c^4d^2e^2+180c^2de^3+35e^4)\sqrt{1-c^2x^2}}{315c^9} \\ &\quad - \frac{4be(105c^6d^3+189c^4d^2e+135c^2de^2+35e^3)(1-c^2x^2)^{3/2}}{945c^9} \\ &\quad + \frac{2be^2(63c^4d^2+90c^2de+35e^2)(1-c^2x^2)^{5/2}}{525c^9} \\ &\quad - \frac{4be^3(9c^2d+7e)(1-c^2x^2)^{7/2}}{441c^9} + \frac{be^4(1-c^2x^2)^{9/2}}{81c^9} \\ &\quad + d^4x(a+b\arcsin(cx)) + \frac{4}{3}d^3ex^3(a+b\arcsin(cx)) + \frac{6}{5}d^2e^2x^5(a+b\arcsin(cx)) + \frac{4}{7}de^3x^7(a+b\arcsin(cx)) + \frac{1}{9}\end{aligned}$$

```
[Out] -4/945*b*e*(105*c^6*d^3+189*c^4*d^2*e+135*c^2*d*e^2+35*e^3)*(-c^2*x^2+1)^(3
/2)/c^9+2/525*b*e^2*(63*c^4*d^2+90*c^2*d*e+35*e^2)*(-c^2*x^2+1)^(5/2)/c^9-4
/441*b*e^3*(9*c^2*d+7*e)*(-c^2*x^2+1)^(7/2)/c^9+1/81*b*e^4*(-c^2*x^2+1)^(9/
2)/c^9+d^4*x*(a+b*arcsin(c*x))+4/3*d^3*e*x^3*(a+b*arcsin(c*x))+6/5*d^2*e^2*
x^5*(a+b*arcsin(c*x))+4/7*d*e^3*x^7*(a+b*arcsin(c*x))+1/9*e^4*x^9*(a+b*arcs
in(c*x))+1/315*b*(315*c^8*d^4+420*c^6*d^3*e+378*c^4*d^2*e^2+180*c^2*d*e^3+3
5*e^4)*(-c^2*x^2+1)^(1/2)/c^9
```

Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 317, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {200, 4755, 12, 1813, 1864}

$$\begin{aligned}
&\int \left(d+ex^2\right)^4 (a+b\arcsin(cx))\,dx\\
&= d^4x(a+b\arcsin(cx))+\frac{4}{3}d^3ex^3(a+b\arcsin(cx))+\frac{6}{5}d^2e^2x^5(a+b\arcsin(cx))\\
&\quad+\frac{4}{7}de^3x^7(a+b\arcsin(cx))+\frac{1}{9}e^4x^9(a+b\arcsin(cx))-\frac{4be^3(1-c^2x^2)^{7/2}\left(9c^2d+7e\right)}{441c^9}\\
&\quad+\frac{be^4(1-c^2x^2)^{9/2}}{81c^9}+\frac{2be^2(1-c^2x^2)^{5/2}\left(63c^4d^2+90c^2de+35e^2\right)}{525c^9}\\
&\quad-\frac{4be(1-c^2x^2)^{3/2}\left(105c^6d^3+189c^4d^2e+135c^2de^2+35e^3\right)}{945c^9}\\
&\quad+\frac{b\sqrt{1-c^2x^2}\left(315c^8d^4+420c^6d^3e+378c^4d^2e^2+180c^2de^3+35e^4\right)}{315c^9}
\end{aligned}$$

```
[In] Int[(d + e*x^2)^4*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*(315*c^8*d^4 + 420*c^6*d^3*e + 378*c^4*d^2*e^2 + 180*c^2*d*e^3 + 35*e^4)
*Sqrt[1 - c^2*x^2])/(315*c^9) - (4*b*e*(105*c^6*d^3 + 189*c^4*d^2*e + 135*c
^2*d*e^2 + 35*e^3)*(1 - c^2*x^2)^(3/2))/(945*c^9) + (2*b*e^2*(63*c^4*d^2 +
90*c^2*d*e + 35*e^2)*(1 - c^2*x^2)^(5/2))/(525*c^9) - (4*b*e^3*(9*c^2*d + 7
*e)*(1 - c^2*x^2)^(7/2))/(441*c^9) + (b*e^4*(1 - c^2*x^2)^(9/2))/(81*c^9) +
 d^4*x*(a + b*ArcSin[c*x]) + (4*d^3*e*x^3*(a + b*ArcSin[c*x]))/3 + (6*d^2*e
^2*x^5*(a + b*ArcSin[c*x]))/5 + (4*d*e^3*x^7*(a + b*ArcSin[c*x]))/7 + (e^4*
x^9*(a + b*ArcSin[c*x]))/9
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 1813

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1864

```
Int[(Pq_)*((a_) + (b_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Int[ExpandIntegrand
[Pq*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && PolyQ[Pq, x] && (IGtQ[p
, 0] || EqQ[n, 1])
```

Rule 4755

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rubi steps

$$\begin{aligned}
\text{integral} &= d^4x(a+b\arcsin(cx)) + \frac{4}{3}d^3ex^3(a+b\arcsin(cx)) + \frac{6}{5}d^2e^2x^5(a+b\arcsin(cx)) \\
&\quad + \frac{4}{7}de^3x^7(a+b\arcsin(cx)) + \frac{1}{9}e^4x^9(a+b\arcsin(cx)) \\
&\quad - (bc)\int \frac{x(315d^4+420d^3ex^2+378d^2e^2x^4+180de^3x^6+35e^4x^8)}{315\sqrt{1-c^2x^2}}\,dx \\
&= d^4x(a+b\arcsin(cx)) + \frac{4}{3}d^3ex^3(a+b\arcsin(cx)) + \frac{6}{5}d^2e^2x^5(a+b\arcsin(cx)) \\
&\quad + \frac{4}{7}de^3x^7(a+b\arcsin(cx)) + \frac{1}{9}e^4x^9(a+b\arcsin(cx)) \\
&\quad - \frac{1}{315}(bc)\int \frac{x(315d^4+420d^3ex^2+378d^2e^2x^4+180de^3x^6+35e^4x^8)}{\sqrt{1-c^2x^2}}\,dx \\
&= d^4x(a+b\arcsin(cx)) + \frac{4}{3}d^3ex^3(a+b\arcsin(cx)) + \frac{6}{5}d^2e^2x^5(a+b\arcsin(cx)) \\
&\quad + \frac{4}{7}de^3x^7(a+b\arcsin(cx)) + \frac{1}{9}e^4x^9(a+b\arcsin(cx)) \\
&\quad - \frac{1}{630}(bc)\text{Subst}\left(\int \frac{315d^4+420d^3ex+378d^2e^2x^2+180de^3x^3+35e^4x^4}{\sqrt{1-c^2x}}\,dx, x, x^2\right)
\end{aligned}$$

$$= d^4x(a+b\arcsin(cx)) + \frac{4}{3}d^3ex^3(a+b\arcsin(cx)) + \frac{6}{5}d^2e^2x^5(a+b\arcsin(cx)) + \frac{4}{7}de^3x^7(a+b\arcsin(cx)) + \frac{1}{9}e^4x^9(a+b\arcsin(cx)) - \frac{1}{630}(bc)\text{Subst}\left(\int \left(\frac{315c^8d^4+420c^6d^3e+378c^4d^2e^2+180c^2de^3+35e^4}{c^8\sqrt{1-c^2x}} - \frac{4e(105c^6d^3+189c^4d^2e+135c^2de^2+35e^3)\sqrt{1-c^2x}}{c^8} + \frac{6e^2(63c^4d^2+90c^2de+35e^2)(1-c^2x)^{3/2}}{c^8} - \frac{20e^3(9c^2d+7e)(1-c^2x)^{5/2}}{c^8} + \frac{35e^4(1-c^2x)^{7/2}}{c^8}\right)dx, x, x^2\right)$$

$$= \frac{b(315c^8d^4+420c^6d^3e+378c^4d^2e^2+180c^2de^3+35e^4)\sqrt{1-c^2x^2}}{315c^9} - \frac{4be(105c^6d^3+189c^4d^2e+135c^2de^2+35e^3)(1-c^2x^2)^{3/2}}{945c^9} + \frac{2be^2(63c^4d^2+90c^2de+35e^2)(1-c^2x^2)^{5/2}}{525c^9} - \frac{4be^3(9c^2d+7e)(1-c^2x^2)^{7/2}}{441c^9} + \frac{be^4(1-c^2x^2)^{9/2}}{81c^9} + d^4x(a+b\arcsin(cx)) + \frac{4}{3}d^3ex^3(a+b\arcsin(cx)) + \frac{6}{5}d^2e^2x^5(a+b\arcsin(cx)) + \frac{4}{7}de^3x^7(a+b\arcsin(c$$

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 260, normalized size of antiderivative = 0.82

$$\int (d+ex^2)^4 (a+b\arcsin(cx))\,dx$$

$$= \frac{315ax(315d^4+420d^3ex^2+378d^2e^2x^4+180de^3x^6+35e^4x^8) + \frac{b\sqrt{1-c^2x^2}(4480e^4+320c^2e^3(81d+7ex^2)+48c^4e^2(1323d^2+}{}}{}$$

```
[In] Integrate[(d + e*x^2)^4*(a + b*ArcSin[c*x]),x]
```

```
[Out] (315*a*x*(315*d^4 + 420*d^3*e*x^2 + 378*d^2*e^2*x^4 + 180*d*e^3*x^6 + 35*e^
4*x^8) + (b*Sqrt[1 - c^2*x^2]*(4480*e^4 + 320*c^2*e^3*(81*d + 7*e*x^2) + 48
*c^4*e^2*(1323*d^2 + 270*d*e*x^2 + 35*e^2*x^4) + 8*c^6*e*(11025*d^3 + 3969*
d^2*e*x^2 + 1215*d*e^2*x^4 + 175*e^3*x^6) + c^8*(99225*d^4 + 44100*d^3*e*x^
2 + 23814*d^2*e^2*x^4 + 8100*d*e^3*x^6 + 1225*e^4*x^8)))/c^9 + 315*b*x*(315
*d^4 + 420*d^3*e*x^2 + 378*d^2*e^2*x^4 + 180*d*e^3*x^6 + 35*e^4*x^8)*ArcSin
[c*x])/99225
```

Maple [A] (verified)

Time = 0.21 (sec) , antiderivative size = 440, normalized size of antiderivative = 1.39

method	result
parts	$a\left(\frac{1}{9}e^4x^9+\frac{4}{7}d\,e^3x^7+\frac{6}{5}d^2e^2x^5+\frac{4}{3}d^3e\,x^3+d^4x\right)+\frac{b\left(\frac{c\arcsin(cx)e^4x^9}{9}+\frac{4c\arcsin(cx)d\,e^3x^7}{7}+\frac{6c\arcsin(cx}{5}\right.}{}$
derivativedivides	$\frac{a\left(c^9d^4x+\frac{4}{3}c^9d^3e\,x^3+\frac{6}{5}c^9d^2e^2x^5+\frac{4}{7}c^9d\,e^3x^7+\frac{1}{9}e^4c^9x^9\right)}{c^8}+\frac{b\left(\arcsin(cx)c^9d^4x+\frac{4\arcsin(cx)c^9d^3e\,x^3}{3}+\frac{6\arcsin(cx)c^9d^2e^2x^5}{5}+\frac{4\,a}{}\right.}{}$
default	$\frac{a\left(c^9d^4x+\frac{4}{3}c^9d^3e\,x^3+\frac{6}{5}c^9d^2e^2x^5+\frac{4}{7}c^9d\,e^3x^7+\frac{1}{9}e^4c^9x^9\right)}{c^8}+\frac{b\left(\arcsin(cx)c^9d^4x+\frac{4\arcsin(cx)c^9d^3e\,x^3}{3}+\frac{6\arcsin(cx)c^9d^2e^2x^5}{5}+\frac{4\,a}{}\right.}{}$

```
[In] int((e*x^2+d)^4*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/9*e^4*x^9+4/7*d*e^3*x^7+6/5*d^2*e^2*x^5+4/3*d^3*e*x^3+d^4*x)+b/c*(1/9*
c*arcsin(c*x)*e^4*x^9+4/7*c*arcsin(c*x)*d*e^3*x^7+6/5*c*arcsin(c*x)*d^2*e^2
*x^5+4/3*c*arcsin(c*x)*d^3*e*x^3+arcsin(c*x)*d^4*c*x-1/315/c^8*(35*e^4*(-1/
9*c^8*x^8*(-c^2*x^2+1)^(1/2)-8/63*c^6*x^6*(-c^2*x^2+1)^(1/2)-16/105*c^4*x^4
*(-c^2*x^2+1)^(1/2)-64/315*c^2*x^2*(-c^2*x^2+1)^(1/2)-128/315*(-c^2*x^2+1)^
(1/2))-315*c^8*d^4*(-c^2*x^2+1)^(1/2)+180*c^2*d*e^3*(-1/7*c^6*x^6*(-c^2*x^2
+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-1
6/35*(-c^2*x^2+1)^(1/2))+378*c^4*d^2*e^2*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4
/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))+420*c^6*d^3*e*(-1/3
*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.25 (sec) , antiderivative size = 321, normalized size of antiderivative = 1.01

$$\int \left(d+ex^2\right)^4(a+b\arcsin(cx))\,dx$$
$$=\frac{11025\,ac^9e^4x^9+56700\,ac^9de^3x^7+119070\,ac^9d^2e^2x^5+132300\,ac^9d^3ex^3+99225\,ac^9d^4x+315\,(35\,bc^9e^4x^9}{}$$

```
[In] integrate((e*x^2+d)^4*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

```
[Out] 1/99225*(11025*a*c^9*e^4*x^9 + 56700*a*c^9*d*e^3*x^7 + 119070*a*c^9*d^2*e^2
*x^5 + 132300*a*c^9*d^3*e*x^3 + 99225*a*c^9*d^4*x + 315*(35*b*c^9*e^4*x^9 +
 180*b*c^9*d*e^3*x^7 + 378*b*c^9*d^2*e^2*x^5 + 420*b*c^9*d^3*e*x^3 + 315*b*
c^9*d^4*x)*arcsin(c*x) + (1225*b*c^8*e^4*x^8 + 99225*b*c^8*d^4 + 88200*b*c^
```

```
6*d^3*e + 63504*b*c^4*d^2*e^2 + 25920*b*c^2*d*e^3 + 100*(81*b*c^8*d*e^3 + 1
4*b*c^6*e^4)*x^6 + 4480*b*e^4 + 6*(3969*b*c^8*d^2*e^2 + 1620*b*c^6*d*e^3 +
280*b*c^4*e^4)*x^4 + 4*(11025*b*c^8*d^3*e + 7938*b*c^6*d^2*e^2 + 3240*b*c^4
*d*e^3 + 560*b*c^2*e^4)*x^2)*sqrt(-c^2*x^2 + 1))/c^9
```

Sympy [A] (verification not implemented)

Time = 1.25 (sec) , antiderivative size = 593, normalized size of antiderivative = 1.87

$$\int \left(d+ex^2\right)^4 (a+b\arcsin(cx))\,dx$$
$$= \begin{cases} ad^4x + \frac{4ad^3ex^3}{3} + \frac{6ad^2e^2x^5}{5} + \frac{4ade^3x^7}{7} + \frac{ae^4x^9}{9} + bd^4x\operatorname{asin}(cx) + \frac{4bd^3ex^3\operatorname{asin}(cx)}{3} + \frac{6bd^2e^2x^5\operatorname{asin}(cx)}{5} + \frac{4bde^3x^7\operatorname{asin}(c}{7} \\ a\left(d^4x + \frac{4d^3ex^3}{3} + \frac{6d^2e^2x^5}{5} + \frac{4de^3x^7}{7} + \frac{e^4x^9}{9}\right) \end{cases}$$

```
[In] integrate((e*x**2+d)**4*(a+b*asin(c*x)),x)
```

```
[Out] Piecewise((a*d**4*x + 4*a*d**3*e*x**3/3 + 6*a*d**2*e**2*x**5/5 + 4*a*d*e**3
*x**7/7 + a*e**4*x**9/9 + b*d**4*x*asin(c*x) + 4*b*d**3*e*x**3*asin(c*x)/3
+ 6*b*d**2*e**2*x**5*asin(c*x)/5 + 4*b*d*e**3*x**7*asin(c*x)/7 + b*e**4*x**
9*asin(c*x)/9 + b*d**4*sqrt(-c**2*x**2 + 1)/c + 4*b*d**3*e*x**2*sqrt(-c**2*
x**2 + 1)/(9*c) + 6*b*d**2*e**2*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + 4*b*d*e*
*3*x**6*sqrt(-c**2*x**2 + 1)/(49*c) + b*e**4*x**8*sqrt(-c**2*x**2 + 1)/(81*
c) + 8*b*d**3*e*sqrt(-c**2*x**2 + 1)/(9*c**3) + 8*b*d**2*e**2*x**2*sqrt(-c*
*2*x**2 + 1)/(25*c**3) + 24*b*d*e**3*x**4*sqrt(-c**2*x**2 + 1)/(245*c**3) +
 8*b*e**4*x**6*sqrt(-c**2*x**2 + 1)/(567*c**3) + 16*b*d**2*e**2*sqrt(-c**2*
x**2 + 1)/(25*c**5) + 32*b*d*e**3*x**2*sqrt(-c**2*x**2 + 1)/(245*c**5) + 16
*b*e**4*x**4*sqrt(-c**2*x**2 + 1)/(945*c**5) + 64*b*d*e**3*sqrt(-c**2*x**2
+ 1)/(245*c**7) + 64*b*e**4*x**2*sqrt(-c**2*x**2 + 1)/(2835*c**7) + 128*b*e
**4*sqrt(-c**2*x**2 + 1)/(2835*c**9), Ne(c, 0)), (a*(d**4*x + 4*d**3*e*x**3
/3 + 6*d**2*e**2*x**5/5 + 4*d*e**3*x**7/7 + e**4*x**9/9), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 424, normalized size of antiderivative = 1.34

$$\int \left(d+ex^2\right)^4 (a+b\arcsin(cx))\,dx = \frac{1}{9}\,ae^4x^9 + \frac{4}{7}\,ade^3x^7 + \frac{6}{5}\,ad^2e^2x^5 + \frac{4}{3}\,ad^3ex^3$$
$$+ \frac{4}{9}\left(3\,x^3\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^3e$$
$$+ \frac{2}{25}\left(15\,x^5\arcsin\left(cx\right) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bd^2e^2$$
$$+ \frac{4}{245}\left(35\,x^7\arcsin\left(cx\right) + \left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2} + \frac{6\sqrt{-c^2x^2+1}x^4}{c^4} + \frac{8\sqrt{-c^2x^2+1}x^2}{c^6} + \frac{16\sqrt{-c^2x^2+1}}{c^8}\right)\right.$$
$$+ \frac{1}{2835}\left(315\,x^9\arcsin\left(cx\right) + \left(\frac{35\sqrt{-c^2x^2+1}x^8}{c^2} + \frac{40\sqrt{-c^2x^2+1}x^6}{c^4} + \frac{48\sqrt{-c^2x^2+1}x^4}{c^6} + \frac{64\sqrt{-c^2x^2}}{c^8}\right.\right.$$
$$+ ad^4x + \frac{\left(cx\arcsin\left(cx\right) + \sqrt{-c^2x^2+1}\right)bd^4}{c}$$

```
[In] integrate((e*x^2+d)^4*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] 1/9*a*e^4*x^9 + 4/7*a*d*e^3*x^7 + 6/5*a*d^2*e^2*x^5 + 4/3*a*d^3*e*x^3 + 4/9
*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/
c^4))*b*d^3*e + 2/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 +
4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d^2*e^2 + 4/2
45*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x^2 +
1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)*c)*b
*d*e^3 + 1/2835*(315*x^9*arcsin(c*x) + (35*sqrt(-c^2*x^2 + 1)*x^8/c^2 + 40*
sqrt(-c^2*x^2 + 1)*x^6/c^4 + 48*sqrt(-c^2*x^2 + 1)*x^4/c^6 + 64*sqrt(-c^2*x
^2 + 1)*x^2/c^8 + 128*sqrt(-c^2*x^2 + 1)/c^10)*c)*b*e^4 + a*d^4*x + (c*x*ar
csin(c*x) + sqrt(-c^2*x^2 + 1))*b*d^4/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 766 vs. 2(289) = 578.

Time = 0.30 (sec) , antiderivative size = 766, normalized size of antiderivative = 2.42

$$\int \left(d+ex^2\right)^4 (a+b\arcsin(cx))\,dx = \frac{1}{9}\,ae^4x^9+\frac{4}{7}\,ade^3x^7+\frac{6}{5}\,ad^2e^2x^5+\frac{4}{3}\,ad^3ex^3+bd^4x\arcsin\left(cx\right)+ad^4x+\frac{4\,(c^2x^2-1)bd^3ex\arcsin\left(cx\right)}{3\,c^2}+\frac{4\,bd^3ex\arcsin\left(cx\right)}{3\,c^2}+\frac{6\,(c^2x^2-1)^2bd^2e^2x\arcsin\left(cx\right)}{5\,c^4}+\frac{\sqrt{-c^2x^2+1}bd^4}{c}+\frac{12\,(c^2x^2-1)bd^2e^2x\arcsin\left(cx\right)}{5\,c^4}+\frac{4\,(c^2x^2-1)^3bde^3x\arcsin\left(cx\right)}{7\,c^6}-\frac{4\,(-c^2x^2+1)^{\frac{3}{2}}bd^3e}{9\,c^3}+\frac{6\,bd^2e^2x\arcsin\left(cx\right)}{5\,c^4}+\frac{12\,(c^2x^2-1)^2bde^3x\arcsin\left(cx\right)}{7\,c^6}+\frac{(c^2x^2-1)^4be^4x\arcsin\left(cx\right)}{9\,c^8}+\frac{4\,\sqrt{-c^2x^2+1}bd^3e}{3\,c^3}+\frac{6\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}bd^2e^2}{25\,c^5}+\frac{12\,(c^2x^2-1)bde^3x\arcsin\left(cx\right)}{7\,c^6}+\frac{4\,(c^2x^2-1)^3be^4x\arcsin\left(cx\right)}{9\,c^8}-\frac{4\,(-c^2x^2+1)^{\frac{3}{2}}bd^2e^2}{5\,c^5}+\frac{4\,(c^2x^2-1)^3\sqrt{-c^2x^2+1}bde^3}{49\,c^7}+\frac{4\,bde^3x\arcsin\left(cx\right)}{7\,c^6}+\frac{2\,(c^2x^2-1)^2be^4x\arcsin\left(cx\right)}{3\,c^8}+\frac{6\,\sqrt{-c^2x^2+1}bd^2e^2}{5\,c^5}+\frac{12\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}bde^3}{35\,c^7}+\frac{(c^2x^2-1)^4\sqrt{-c^2x^2+1}be^4}{81\,c^9}+\frac{4\,(c^2x^2-1)be^4x\arcsin\left(cx\right)}{9\,c^8}-\frac{4\,(-c^2x^2+1)^{\frac{3}{2}}bde^3}{7\,c^7}+\frac{4\,(c^2x^2-1)^3\sqrt{-c^2x^2+1}be^4}{63\,c^9}+\frac{be^4x\arcsin\left(cx\right)}{9\,c^8}+\frac{4\,\sqrt{-c^2x^2+1}bde^3}{7\,c^7}+\frac{2\,(c^2x^2-1)^2\sqrt{-c^2x^2+1}be^4}{15\,c^9}-\frac{4\,(-c^2x^2+1)^{\frac{3}{2}}be^4}{27\,c^9}+\frac{\sqrt{-c^2x^2+1}be^4}{9\,c^9}$$

```
[In] integrate((e*x^2+d)^4*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] 1/9*a*e^4*x^9 + 4/7*a*d*e^3*x^7 + 6/5*a*d^2*e^2*x^5 + 4/3*a*d^3*e*x^3 + b*d
^4*x*arcsin(c*x) + a*d^4*x + 4/3*(c^2*x^2 - 1)*b*d^3*e*x*arcsin(c*x)/c^2 +
4/3*b*d^3*e*x*arcsin(c*x)/c^2 + 6/5*(c^2*x^2 - 1)^2*b*d^2*e^2*x*arcsin(c*x)
/c^4 + sqrt(-c^2*x^2 + 1)*b*d^4/c + 12/5*(c^2*x^2 - 1)*b*d^2*e^2*x*arcsin(c
*x)/c^4 + 4/7*(c^2*x^2 - 1)^3*b*d*e^3*x*arcsin(c*x)/c^6 - 4/9*(-c^2*x^2 + 1
)^(3/2)*b*d^3*e/c^3 + 6/5*b*d^2*e^2*x*arcsin(c*x)/c^4 + 12/7*(c^2*x^2 - 1)^
2*b*d*e^3*x*arcsin(c*x)/c^6 + 1/9*(c^2*x^2 - 1)^4*b*e^4*x*arcsin(c*x)/c^8 +
 4/3*sqrt(-c^2*x^2 + 1)*b*d^3*e/c^3 + 6/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 +
1)*b*d^2*e^2/c^5 + 12/7*(c^2*x^2 - 1)*b*d*e^3*x*arcsin(c*x)/c^6 + 4/9*(c^2*
x^2 - 1)^3*b*e^4*x*arcsin(c*x)/c^8 - 4/5*(-c^2*x^2 + 1)^(3/2)*b*d^2*e^2/c^5
 + 4/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*d*e^3/c^7 + 4/7*b*d*e^3*x*arcs
in(c*x)/c^6 + 2/3*(c^2*x^2 - 1)^2*b*e^4*x*arcsin(c*x)/c^8 + 6/5*sqrt(-c^2*x
^2 + 1)*b*d^2*e^2/c^5 + 12/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*d*e^3/c^
7 + 1/81*(c^2*x^2 - 1)^4*sqrt(-c^2*x^2 + 1)*b*e^4/c^9 + 4/9*(c^2*x^2 - 1)*b
*e^4*x*arcsin(c*x)/c^8 - 4/7*(-c^2*x^2 + 1)^(3/2)*b*d*e^3/c^7 + 4/63*(c^2*x
^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b*e^4/c^9 + 1/9*b*e^4*x*arcsin(c*x)/c^8 + 4/7*
sqrt(-c^2*x^2 + 1)*b*d*e^3/c^7 + 2/15*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*
e^4/c^9 - 4/27*(-c^2*x^2 + 1)^(3/2)*b*e^4/c^9 + 1/9*sqrt(-c^2*x^2 + 1)*b*e^
4/c^9
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex^2)^4 (a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\left(e\,x^2+d\right)^4\,dx$$

```
[In] int((a + b*asin(c*x))*(d + e*x^2)^4,x)
[Out] int((a + b*asin(c*x))*(d + e*x^2)^4, x)
```

3.624 $\int \frac{x^4(a+b\arcsin(cx))}{d+ex^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 653

$$
\begin{aligned}
\int \frac{x^4(a+b\arcsin(cx))}{d+ex^2}\,dx =& -\frac{adx}{e^2}-\frac{bd\sqrt{1-c^2x^2}}{ce^2}+\frac{b\sqrt{1-c^2x^2}}{3c^3e}-\frac{b(1-c^2x^2)^{3/2}}{9c^3e} \\
&-\frac{bdx\arcsin(cx)}{e^2}+\frac{x^3(a+b\arcsin(cx))}{3e} \\
&+\frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{5/2}} \\
&-\frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{5/2}} \\
&+\frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{5/2}} \\
&-\frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{5/2}} \\
&+\frac{ib(-d)^{3/2}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{5/2}} \\
&-\frac{ib(-d)^{3/2}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{5/2}} \\
&+\frac{ib(-d)^{3/2}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{5/2}} \\
&-\frac{ib(-d)^{3/2}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{5/2}}
\end{aligned}
$$

```
[Out] -a*d*x/e^2-1/9*b*(-c^2*x^2+1)^(3/2)/c^3/e-b*d*x*arcsin(c*x)/e^2+1/3*x^3*(a+
b*arcsin(c*x))/e+1/2*(-d)^(3/2)*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^
```

```
(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^(5/2)-1/2*(-d)^(3/2)*(a+
b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2
*d+e)^(1/2)))/e^(5/2)+1/2*(-d)^(3/2)*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^
2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(5/2)-1/2*(-d)^(3/2
)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)
+(c^2*d+e)^(1/2)))/e^(5/2)+1/2*I*b*(-d)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1
)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^(5/2)-1/2*I*b*(-d)^(3/
2)*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(
1/2)))/e^(5/2)+1/2*I*b*(-d)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(
1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(5/2)-1/2*I*b*(-d)^(3/2)*polylog(2
,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(5/
2)-b*d*(-c^2*x^2+1)^(1/2)/c/e^2+1/3*b*(-c^2*x^2+1)^(1/2)/c^3/e
```

Rubi [A] (verified)

Time = 0.76 (sec) , antiderivative size = 653, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.571$, Rules used = {4817, 4715, 267, 4723, 272, 45, 4757, 4825, 4617, 2221, 2317, 2438}

$$\begin{aligned}\int \frac{x^4(a+b\arcsin(cx))}{d+ex^2}\,dx = {}& \frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{5/2}} \\ & -\frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{5/2}} \\ & +\frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{5/2}} \\ & -\frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{5/2}} \\ & +\frac{x^3(a+b\arcsin(cx))}{3e}-\frac{adx}{e^2} \\ & +\frac{ib(-d)^{3/2}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^{5/2}} \\ & -\frac{ib(-d)^{3/2}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^{5/2}} \\ & +\frac{ib(-d)^{3/2}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e^{5/2}} \\ & -\frac{ib(-d)^{3/2}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e^{5/2}}-\frac{bdx\arcsin(cx)}{e^2} \\ & -\frac{bd\sqrt{1-c^2x^2}}{ce^2}-\frac{b(1-c^2x^2)^{3/2}}{9c^3e}+\frac{b\sqrt{1-c^2x^2}}{3c^3e}\end{aligned}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] -((a*d*x)/e^2) - (b*d*Sqrt[1 - c^2*x^2])/(c*e^2) + (b*Sqrt[1 - c^2*x^2])/(3
*c^3*e) - (b*(1 - c^2*x^2)^(3/2))/(9*c^3*e) - (b*d*x*ArcSin[c*x])/e^2 + (x^
3*(a + b*ArcSin[c*x]))/(3*e) + ((-d)^(3/2)*(a + b*ArcSin[c*x])*Log[1 - (Sqr
t[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^(5/2)) - ((
-d)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] - Sqrt[c^2*d + e])])/(2*e^(5/2)) + ((-d)^(3/2)*(a + b*ArcSin[c*x])*Log
[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^(5
/2)) - ((-d)^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/
(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^(5/2)) + ((I/2)*b*(-d)^(3/2)*PolyLo
g[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/e^(5
/2) - ((I/2)*b*(-d)^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[
-d] - Sqrt[c^2*d + e])])/e^(5/2) + ((I/2)*b*(-d)^(3/2)*PolyLog[2, -((Sqrt[e
]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/e^(5/2) - ((I/2)*b
*(-d)^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2
*d + e])])/e^(5/2)
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(-\frac{d(a+b\arcsin(cx))}{e^2}+\frac{x^2(a+b\arcsin(cx))}{e}+\frac{d^2(a+b\arcsin(cx))}{e^2\left(d+ex^2\right)}\right)dx\\
&= -\frac{d\int(a+b\arcsin(cx))\,dx}{e^2}+\frac{d^2\int\frac{a+b\arcsin(cx)}{d+ex^2}\,dx}{e^2}+\frac{\int x^2(a+b\arcsin(cx))\,dx}{e}\\
&= -\frac{adx}{e^2}+\frac{x^3(a+b\arcsin(cx))}{3e}-\frac{(bd)\int\arcsin(cx)\,dx}{e^2}\\
&\quad+\frac{d^2\int\left(\frac{\sqrt{-d}(a+b\arcsin(cx))}{2d\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\sqrt{-d}(a+b\arcsin(cx))}{2d\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{e^2}-\frac{(bc)\int\frac{x^3}{\sqrt{1-c^2x^2}}\,dx}{3e}\\
&= -\frac{adx}{e^2}-\frac{bdx\arcsin(cx)}{e^2}+\frac{x^3(a+b\arcsin(cx))}{3e}-\frac{(-d)^{3/2}\int\frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2e^2}\\
&\quad-\frac{(-d)^{3/2}\int\frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2e^2}+\frac{(bcd)\int\frac{x}{\sqrt{1-c^2x^2}}\,dx}{e^2}-\frac{(bc)\text{Subst}\left(\int\frac{x}{\sqrt{1-c^2x}}\,dx,x,x^2\right)}{6e}\\
&= -\frac{adx}{e^2}-\frac{bd\sqrt{1-c^2x^2}}{ce^2}-\frac{bdx\arcsin(cx)}{e^2}+\frac{x^3(a+b\arcsin(cx))}{3e}\\
&\quad-\frac{(-d)^{3/2}\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2e^2}\\
&\quad-\frac{(-d)^{3/2}\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2e^2}\\
&\quad-\frac{(bc)\text{Subst}\left(\int\left(\frac{1}{c^2\sqrt{1-c^2x}}-\frac{\sqrt{1-c^2x}}{c^2}\right)dx,x,x^2\right)}{6e}\\
&= -\frac{adx}{e^2}-\frac{bd\sqrt{1-c^2x^2}}{ce^2}+\frac{b\sqrt{1-c^2x^2}}{3c^3e}-\frac{b\left(1-c^2x^2\right)^{3/2}}{9c^3e}-\frac{bdx\arcsin(cx)}{e^2}\\
&\quad+\frac{x^3(a+b\arcsin(cx))}{3e}-\frac{\left(i(-d)^{3/2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2e^2}\\
&\quad-\frac{\left(i(-d)^{3/2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2e^2}\\
&\quad-\frac{\left(i(-d)^{3/2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2e^2}\\
&\quad-\frac{\left(i(-d)^{3/2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2e^2}
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{adx}{e^2} - \frac{bd\sqrt{1-c^2x^2}}{ce^2} + \frac{b\sqrt{1-c^2x^2}}{3c^3e} - \frac{b(1-c^2x^2)^{3/2}}{9c^3e} - \frac{bdx\arcsin(cx)}{e^2} \\
&+ \frac{x^3(a+b\arcsin(cx))}{3e} + \frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{5/2}} \\
&- \frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{5/2}} \\
&+ \frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{5/2}} \\
&- \frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{5/2}} \\
&- \frac{\left(b(-d)^{3/2}\right)\operatorname{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^{5/2}} \\
&+ \frac{\left(b(-d)^{3/2}\right)\operatorname{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^{5/2}} \\
&- \frac{\left(b(-d)^{3/2}\right)\operatorname{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^{5/2}} \\
&+ \frac{\left(b(-d)^{3/2}\right)\operatorname{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^{5/2}}
\end{aligned}
$$

$$= -\frac{adx}{e^2} - \frac{bd\sqrt{1-c^2x^2}}{ce^2} + \frac{b\sqrt{1-c^2x^2}}{3c^3e} - \frac{b(1-c^2x^2)^{3/2}}{9c^3e} - \frac{bdx\arcsin(cx)}{e^2} + \frac{x^3(a+b\arcsin(cx))}{3e} + \frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{5/2}} - \frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{5/2}} + \frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{5/2}} - \frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{5/2}} + \frac{\left(ib(-d)^{3/2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^{5/2}} - \frac{\left(ib(-d)^{3/2}\right)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^{5/2}} + \frac{\left(ib(-d)^{3/2}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^{5/2}} - \frac{\left(ib(-d)^{3/2}\right)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^{5/2}}$$

$$= -\frac{adx}{e^2} - \frac{bd\sqrt{1-c^2x^2}}{ce^2} + \frac{b\sqrt{1-c^2x^2}}{3c^3e} - \frac{b(1-c^2x^2)^{3/2}}{9c^3e} - \frac{bdx\arcsin(cx)}{e^2} + \frac{x^3(a+b\arcsin(cx))}{3e} + \frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{5/2}} - \frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{5/2}} + \frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{5/2}} - \frac{(-d)^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{5/2}} + \frac{ib(-d)^{3/2}\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{5/2}} - \frac{ib(-d)^{3/2}\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{5/2}} + \frac{ib(-d)^{3/2}\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{5/2}} - \frac{ib(-d)^{3/2}\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{5/2}}$$

Mathematica [A] (verified)

Time = 0.67 (sec) , antiderivative size = 515, normalized size of antiderivative = 0.79

$$\int \frac{x^4(a+b\arcsin(cx))}{d+ex^2}\,dx = -\frac{adx}{e^2}+\frac{ax^3}{3e}+\frac{ad^{3/2}\arctan\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{e^{5/2}} + \frac{b\left(-\frac{4d\sqrt{e}\left(\sqrt{1-c^2x^2}+cx\arcsin(cx)\right)}{c}+\frac{4e^{3/2}\left(\sqrt{1-c^2x^2}(2+c^2x^2)+3c^3x^3\arcsin(cx)\right)}{9c^3}+d^{3/2}\left(-\arcsin(cx)\left(\arcsin(cx)+2\right.\right.\right.}{}$$

[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2),x]

[Out] -((a*d*x)/e^2) + (a*x^3)/(3*e) + (a*d^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/e^(5/2) + (b*((-4*d*Sqrt[e]*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]))/c + (4*e^(3/2)*(Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + 3*c^3*x^3*ArcSin[c*x]))/(9*c^3) + d^(3/2)*(-(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]))) - 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] - 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]) + d^(3/2)*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])))/(4*e^(5/2))

Maple [C] (verified)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 13.20 (sec) , antiderivative size = 376, normalized size of antiderivative = 0.58

method	result
parts	$\frac{a\,x^3}{3e} - \frac{adx}{e^2} + \frac{a\,d^2\arctan\left(\frac{ex}{\sqrt{de}}\right)}{e^2\sqrt{de}} - \frac{bd\sqrt{-c^2x^2+1}}{c\,e^2} - \frac{bdx\arcsin(cx)}{e^2} + \frac{b\sqrt{-c^2x^2+1}}{4c^3e} + \frac{b\arcsin(cx)x}{4c^2e} + \frac{bc\,d^2\Bigg(-}{}$
derivativedivides	$-\frac{a\,c^5dx}{e^2} + \frac{a\,c^5x^3}{3e} + \frac{a\,c^5d^2\arctan\left(\frac{ex}{\sqrt{de}}\right)}{e^2\sqrt{de}} - \frac{b\,c^4\sqrt{-c^2x^2+1}\,d}{e^2} - \frac{b\,c^5\arcsin(cx)dx}{e^2} + \frac{b\,c^2\sqrt{-c^2x^2+1}}{4e} + \frac{b\,c^3\arcsin(cx)x}{4e} - \frac{b\,c^6d^2\Bigg(\_R1=}{}$
default	$-\frac{a\,c^5dx}{e^2} + \frac{a\,c^5x^3}{3e} + \frac{a\,c^5d^2\arctan\left(\frac{ex}{\sqrt{de}}\right)}{e^2\sqrt{de}} - \frac{b\,c^4\sqrt{-c^2x^2+1}\,d}{e^2} - \frac{b\,c^5\arcsin(cx)dx}{e^2} + \frac{b\,c^2\sqrt{-c^2x^2+1}}{4e} + \frac{b\,c^3\arcsin(cx)x}{4e} - \frac{b\,c^6d^2\Bigg(\_R1=}{}$

```
[In] int(x^4*(a+b*arcsin(c*x))/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*a/e*x^3-a*d*x/e^2+a*d^2/e^2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-b*d*(-c
^2*x^2+1)^(1/2)/c/e^2-b*d*x*arcsin(c*x)/e^2+1/4*b*(-c^2*x^2+1)^(1/2)/c^3/e+
1/4*b/c^2/e*arcsin(c*x)*x+1/2*b*c/e^2*d^2*sum(1/_R1/(_R1^2*e-2*c^2*d-e)*(I*
arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x
^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/2*b*c/e^2*d^
2*sum(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/
2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c
^2*d-2*e)*_Z^2+e))-1/36*b/c^3/e*cos(3*arcsin(c*x))-1/12*b/c^3*arcsin(c*x)/e
*sin(3*arcsin(c*x))
```

Fricas [F]

$$\int \frac{x^4(a + b\arcsin(cx))}{d + ex^2}\,dx = \int \frac{(b\arcsin{(cx)} + a)x^4}{ex^2 + d}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)/(e*x^2 + d), x)
```

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{d+ex^2}\,dx = \int \frac{x^4(a+b\operatorname{asin}(cx))}{d+ex^2}\,dx$$

[In] integrate(x**4*(a+b*asin(c*x))/(e*x**2+d),x)

[Out] Integral(x**4*(a + b*asin(c*x))/(d + e*x**2), x)

Maxima [F(-2)]

Exception generated.

$$\int \frac{x^4(a+b\arcsin(cx))}{d+ex^2}\,dx = \text{Exception raised: ValueError}$$

[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")

[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e

Giac [F(-2)]

Exception generated.

$$\int \frac{x^4(a+b\arcsin(cx))}{d+ex^2}\,dx = \text{Exception raised: RuntimeError}$$

[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")

[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a+b\arcsin(cx))}{d+ex^2}\,dx=\int \frac{x^4\,(a+b\,\mathrm{asin}(c\,x))}{e\,x^2+d}\,dx$$

```
[In] int((x^4*(a + b*asin(c*x)))/(d + e*x^2),x)
[Out] int((x^4*(a + b*asin(c*x)))/(d + e*x^2), x)
```

3.625 $\int \frac{x^3(a+b\arcsin(cx))}{d+ex^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 559

$$\begin{aligned}\int \frac{x^3(a+b\arcsin(cx))}{d+ex^2}\,dx &= \frac{bx\sqrt{1-c^2x^2}}{4ce}-\frac{b\arcsin(cx)}{4c^2e} \\ &\quad+\frac{x^2(a+b\arcsin(cx))}{2e}+\frac{id(a+b\arcsin(cx))^2}{2be^2} \\ &\quad-\frac{d(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2} \\ &\quad-\frac{d(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2} \\ &\quad-\frac{d(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2} \\ &\quad-\frac{d(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2} \\ &\quad+\frac{ibd\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2} \\ &\quad+\frac{ibd\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2} \\ &\quad+\frac{ibd\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2} \\ &\quad+\frac{ibd\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2}\end{aligned}$$

```
[Out] -1/4*b*arcsin(c*x)/c^2/e+1/2*x^2*(a+b*arcsin(c*x))/e+1/2*I*d*(a+b*arcsin(c*
x))^2/b/e^2-1/2*d*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)
```

```
/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^2-1/2*d*(a+b*arcsin(c*x))*ln(1+(I*c*x+
(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^2-1/2*d*(a+
b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2
*d+e)^(1/2)))/e^2-1/2*d*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e
^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^2+1/2*I*b*d*polylog(2,-(I*c*x+(-
c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^2+1/2*I*b*d*p
olylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)
))/e^2+1/2*I*b*d*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1
/2)+(c^2*d+e)^(1/2)))/e^2+1/2*I*b*d*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^
(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^2+1/4*b*x*(-c^2*x^2+1)^(1/2)/c/e
```

Rubi [A] (verified)

Time = 0.60 (sec) , antiderivative size = 559, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.429$, Rules used = {4817, 4723, 327, 222, 4825, 4617, 2221, 2317, 2438}

$$\begin{aligned}\int \frac{x^3(a+b\arcsin(cx))}{d+ex^2}\,dx =& -\frac{d(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2} \\ &-\frac{d(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2} \\ &-\frac{d(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2} \\ &-\frac{d(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2} \\ &+\frac{id(a+b\arcsin(cx))^2}{2be^2}+\frac{x^2(a+b\arcsin(cx))}{2e} \\ &+\frac{ibd\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^2} \\ &+\frac{ibd\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^2} \\ &+\frac{ibd\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e^2} \\ &+\frac{ibd\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e^2}-\frac{b\arcsin(cx)}{4c^2e}+\frac{bx\sqrt{1-c^2x^2}}{4ce}\end{aligned}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] (b*x*Sqrt[1 - c^2*x^2])/(4*c*e) - (b*ArcSin[c*x])/(4*c^2*e) + (x^2*(a + b*A
rcSin[c*x]))/(2*e) + ((I/2)*d*(a + b*ArcSin[c*x])^2)/(b*e^2) - (d*(a + b*Ar
```

```
cSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d +
 e])])/(2*e^2) - (d*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))
/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^2) - (d*(a + b*ArcSin[c*x])*Log[1
- (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^2) -
(d*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] +
Sqrt[c^2*d + e])])/(2*e^2) + ((I/2)*b*d*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c
*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/e^2 + ((I/2)*b*d*PolyLog[2, (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/e^2 + ((I/2)*b*d*
PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))]
)/e^2 + ((I/2)*b*d*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/e^2
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
```

```
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \left(\frac{x(a+b\arcsin(cx))}{e} - \frac{dx(a+b\arcsin(cx))}{e\,(d+ex^2)}\right) dx$$

$$= \frac{\int x(a+b\arcsin(cx))\,dx}{e} - \frac{d\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx}{e}$$

$$= \frac{x^2(a+b\arcsin(cx))}{2e} - \frac{(bc)\int \frac{x^2}{\sqrt{1-c^2x^2}}\,dx}{2e} - \frac{d\int \left(-\frac{a+b\arcsin(cx)}{2\sqrt{e}(\sqrt{-d}-\sqrt{e}x)} + \frac{a+b\arcsin(cx)}{2\sqrt{e}(\sqrt{-d}+\sqrt{e}x)}\right)dx}{e}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce} + \frac{x^2(a+b\arcsin(cx))}{2e} + \frac{d\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2e^{3/2}} - \frac{d\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2e^{3/2}} - \frac{b\int \frac{1}{\sqrt{1-c^2x^2}}\,dx}{4ce}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce} - \frac{b\arcsin(cx)}{4c^2e} + \frac{x^2(a+b\arcsin(cx))}{2e} + \frac{d\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{2e^{3/2}} - \frac{d\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{2e^{3/2}}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce} - \frac{b\arcsin(cx)}{4c^2e} + \frac{x^2(a+b\arcsin(cx))}{2e} + \frac{id(a+b\arcsin(cx))^2}{2be^2} + \frac{(id)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2e^{3/2}} + \frac{(id)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2e^{3/2}} - \frac{(id)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2e^{3/2}} - \frac{(id)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2e^{3/2}}$$

$$= \frac{bx\sqrt{1-c^2x^2}}{4ce} - \frac{b\arcsin(cx)}{4c^2e} + \frac{x^2(a+b\arcsin(cx))}{2e} + \frac{id(a+b\arcsin(cx))^2}{2be^2} - \frac{d(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2} - \frac{d(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2} - \frac{d(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2} - \frac{d(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2} + \frac{(bd)\text{Subst}\left(\int \log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^2} + \frac{(bd)\text{Subst}\left(\int \log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^2} + \frac{(bd)\text{Subst}\left(\int \log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^2} + \frac{(bd)\text{Subst}\left(\int \log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^2}$$

$$
\begin{aligned}
&=\frac{bx\sqrt{1-c^2x^2}}{4ce}-\frac{b\arcsin(cx)}{4c^2e}+\frac{x^2(a+b\arcsin(cx))}{2e}\\
&+\frac{id(a+b\arcsin(cx))^2}{2be^2}-\frac{d(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2}\\
&-\frac{d(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2}\\
&-\frac{d(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2}\\
&-\frac{d(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2}\\
&-\frac{(ibd)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2e^2}\\
&-\frac{(ibd)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2e^2}\\
&-\frac{(ibd)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2e^2}\\
&-\frac{(ibd)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2e^2}
\end{aligned}
$$

$$
\begin{aligned}
&=\frac{bx\sqrt{1-c^2x^2}}{4ce}-\frac{b\arcsin(cx)}{4c^2e}+\frac{x^2(a+b\arcsin(cx))}{2e}\\
&+\frac{id(a+b\arcsin(cx))^2}{2be^2}-\frac{d(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2}\\
&-\frac{d(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2}\\
&-\frac{d(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2}\\
&-\frac{d(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2}\\
&+\frac{ibd\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2}+\frac{ibd\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2}\\
&+\frac{ibd\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2}+\frac{ibd\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 475, normalized size of antiderivative = 0.85

$$\int \frac{x^3(a+b\arcsin(cx))}{d+ex^2}\,dx$$
$$= \frac{2ac^2ex^2 - 2ac^2d\log\left(d+ex^2\right) + b\left(e\left(cx\sqrt{1-c^2x^2} + 2c^2x^2\arcsin(cx) - 2\arctan\left(\frac{cx}{-1+\sqrt{1-c^2x^2}}\right)\right) + ic^2d\left(a\right.\right.}{}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] (2*a*c^2*e*x^2 - 2*a*c^2*d*Log[d + e*x^2] + b*(e*(c*x*Sqrt[1 - c^2*x^2] + 2
*c^2*x^2*ArcSin[c*x] - 2*ArcTan[(c*x)/(-1 + Sqrt[1 - c^2*x^2])]) + I*c^2*d*
(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*S
qrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
 + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt
[d]) + Sqrt[c^2*d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sq
rt[d] + Sqrt[c^2*d + e]))]) + I*c^2*d*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Lo
g[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1
 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog
[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[
2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])))/(4*c^2*e^2
)
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 2.30 (sec) , antiderivative size = 2088, normalized size of antiderivative = 3.74

method	result	size
derivativedivides	Expression too large to display	2088
default	Expression too large to display	2088
parts	Expression too large to display	2095

```
[In] int(x^3*(a+b*arcsin(c*x))/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(1/2*a*c^4/e*x^2-1/2*a*c^4*d/e^2*ln(c^2*e*x^2+c^2*d)+b*c^2*(1/4*I*(2*
c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2
/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*d*c^2/e^3+1/16*(I+2*arcsin(c*x))/e*
(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)+I*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/
2)+e)*arcsin(c*x)^2*c^4*d^2/e^4+1/2*I*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)
*c^2*d*arcsin(c*x)^2/e^3-(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)/e^4*d^2*c^4*
ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*
arcsin(c*x)+1/2*I*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)*polylog(2,e*(I*c*x+
```

```
(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*c^4*d^2/e^4-1/
2*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)/e^3*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2
))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*c^2*d*arcsin(c*x)+1/16*(2*I*c*x
*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*(-I+2*arcsin(c*x))/e-1/2*I*(-2*(d*c^2*(c^2
*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*d*c^2*pol
ylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)
)/e^3/(c^2*d+e)-I*(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(d*
c^2*(c^2*d+e))^(1/2)*e)*d*c^2*arcsin(c*x)^2/e^3/(c^2*d+e)-1/2*I*(-2*(d*c^2*
(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*d^2*c
^4*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1
/2)+e))/e^4/(c^2*d+e)+(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d
-(d*c^2*(c^2*d+e))^(1/2)*e)/e^4*d^2*c^4/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+1
)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)-1/4*I*(d*c^2*
(c^2*d+e))^(1/2)/e^2*d*c^2/(c^2*d+e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))
^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))-1/2*I*(d*c^2*(c^2*d+e))^(1/2)/e^2
*d*c^2/(c^2*d+e)*arcsin(c*x)^2+(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+
2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)/e^3*d*c^2/(c^2*d+e)*ln(1-e*(I*c*x+(-c^
2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)+1/2*(d
*c^2*(c^2*d+e))^(1/2)/e^2*d*c^2/(c^2*d+e)*arcsin(c*x)*ln(1-e*(I*c*x+(-c^2*x
^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))-I*(-2*(d*c^2*(c^2*d+e
))^(1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*d^2*c^4*arcsi
n(c*x)^2/e^4/(c^2*d+e)-1/8*I*(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*
c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2
/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^2/(c^2*d+e)+1/2*I/e^2*d*c^2*sum((
-_R1^2*e+4*c^2*d+2*e)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c
^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf
(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/2*I*c^2*d*arcsin(c*x)^2/e^2-1/4*I*(-2*(d*
c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*a
rcsin(c*x)^2/e^2/(c^2*d+e)+1/4*(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+
2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)/e^2/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+
1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)-1/4*I*(d*c^2
*(c^2*d+e))^(1/2)/e/(c^2*d+e)*arcsin(c*x)^2-1/8*I*(d*c^2*(c^2*d+e))^(1/2)/e
/(c^2*d+e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*
d+e))^(1/2)+e))+1/4*(d*c^2*(c^2*d+e))^(1/2)/e/(c^2*d+e)*arcsin(c*x)*ln(1-e*
(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))))
```

Fricas [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{d+ex^2}\,dx=\int \frac{(b\arcsin{(cx)}+a)x^3}{ex^2+d}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
[Out] integral((b*x^3*arcsin(c*x) + a*x^3)/(e*x^2 + d), x)
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{d+ex^2}\,dx = \int \frac{x^3(a+b\,\mathrm{asin}\,(cx))}{d+ex^2}\,dx$$

[In] integrate(x**3*(a+b*asin(c*x))/(e*x**2+d),x)

[Out] Integral(x**3*(a + b*asin(c*x))/(d + e*x**2), x)

Maxima [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{d+ex^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^3}{ex^2+d}\,dx$$

[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")

[Out] 1/2*a*(x^2/e - d*log(e*x^2 + d)/e^2) + b*integrate(x^3*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x^2 + d), x)

Giac [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{d+ex^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^3}{ex^2+d}\,dx$$

[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)*x^3/(e*x^2 + d), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a+b\arcsin(cx))}{d+ex^2}\,dx = \int \frac{x^3\,(a+b\,\mathrm{asin}(c\,x))}{e\,x^2+d}\,dx$$

[In] int((x^3*(a + b*asin(c*x)))/(d + e*x^2),x)

[Out] int((x^3*(a + b*asin(c*x)))/(d + e*x^2), x)

3.626 $\int \frac{x^2(a+b\arcsin(cx))}{d+ex^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 579

$$\begin{aligned}\int \frac{x^2(a+b\arcsin(cx))}{d+ex^2}\,dx &= \frac{ax}{e}+\frac{b\sqrt{1-c^2x^2}}{ce}+\frac{bx\arcsin(cx)}{e}\\
&+\frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}}\\
&-\frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}}\\
&+\frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{3/2}}\\
&-\frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{3/2}}\\
&+\frac{ib\sqrt{-d}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}}\\
&-\frac{ib\sqrt{-d}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}}\\
&+\frac{ib\sqrt{-d}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{3/2}}\\
&-\frac{ib\sqrt{-d}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{3/2}}\end{aligned}$$

```
[Out] a*x/e+b*x*arcsin(c*x)/e+1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2
))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(3/2)-1/2*(a+b*ar
csin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e
```

```
)^(1/2)))*(-d)^(1/2)/e^(3/2)+1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)
^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(3/2)-1/2*(a
+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^
2*d+e)^(1/2)))*(-d)^(1/2)/e^(3/2)+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1
/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(3/2)-1/2*I*b*p
olylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)
))*(-d)^(1/2)/e^(3/2)+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)
/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(3/2)-1/2*I*b*polylog(2,(I*
c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*(-d)^(1/2
)/e^(3/2)+b*(-c^2*x^2+1)^(1/2)/c/e
```

Rubi [A] (verified)

Time = 0.61 (sec) , antiderivative size = 579, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.429$, Rules used = {4817, 4715, 267, 4757, 4825, 4617, 2221, 2317, 2438}

$$\begin{aligned}
\int \frac{x^2(a+b\arcsin(cx))}{d+ex^2}\,dx &= \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{3/2}} \\
&\quad -\frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{3/2}} \\
&\quad +\frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{3/2}} \\
&\quad -\frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^{3/2}} \\
&\quad +\frac{ax}{e}+\frac{ib\sqrt{-d}\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^{3/2}} \\
&\quad -\frac{ib\sqrt{-d}\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^{3/2}} \\
&\quad +\frac{ib\sqrt{-d}\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e^{3/2}} \\
&\quad -\frac{ib\sqrt{-d}\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e^{3/2}} \\
&\quad +\frac{bx\arcsin(cx)}{e}+\frac{b\sqrt{1-c^2x^2}}{ce}
\end{aligned}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] (a*x)/e + (b*Sqrt[1 - c^2*x^2])/(c*e) + (b*x*ArcSin[c*x])/e + (Sqrt[-d]*(a
+ b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c
```

```
^2*d + e])])/(2*e^(3/2)) - (Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E
^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^(3/2)) + (Sqrt[-d
]*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/(2*e^(3/2)) - (Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^(3/2)) + ((I
/2)*b*Sqrt[-d]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqr
t[c^2*d + e]))])/e^(3/2) - ((I/2)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/e^(3/2) + ((I/2)*b*Sqrt[-d]*Pol
yLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/e
^(3/2) - ((I/2)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] + Sqrt[c^2*d + e])])/e^(3/2)
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{a+b\arcsin(cx)}{e}-\frac{d(a+b\arcsin(cx))}{e\,(d+ex^2)}\right)dx\\
&= \frac{\int (a+b\arcsin(cx))\,dx}{e}-\frac{d\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx}{e}\\
&= \frac{ax}{e}+\frac{b\int \arcsin(cx)\,dx}{e}-\frac{d\int \left(\frac{\sqrt{-d}(a+b\arcsin(cx))}{2d(\sqrt{-d}-\sqrt{e}x)}+\frac{\sqrt{-d}(a+b\arcsin(cx))}{2d(\sqrt{-d}+\sqrt{e}x)}\right)dx}{e}\\
&= \frac{ax}{e}+\frac{bx\arcsin(cx)}{e}-\frac{(bc)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{e}-\frac{\sqrt{-d}\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2e}-\frac{\sqrt{-d}\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2e}\\
&= \frac{ax}{e}+\frac{b\sqrt{1-c^2x^2}}{ce}+\frac{bx\arcsin(cx)}{e}-\frac{\sqrt{-d}\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2e}\\
&\quad-\frac{\sqrt{-d}\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2e}
\end{aligned}$$

$$=\frac{ax}{e}+\frac{b\sqrt{1-c^2x^2}}{ce}+\frac{bx\arcsin(cx)}{e}-\frac{\left(i\sqrt{-d}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2e}-\frac{\left(i\sqrt{-d}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2e}-\frac{\left(i\sqrt{-d}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2e}-\frac{\left(i\sqrt{-d}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2e}$$

$$=\frac{ax}{e}+\frac{b\sqrt{1-c^2x^2}}{ce}+\frac{bx\arcsin(cx)}{e}+\frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}}-\frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}}+\frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{3/2}}-\frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{3/2}}-\frac{\left(b\sqrt{-d}\right)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2e^{3/2}}+\frac{\left(b\sqrt{-d}\right)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2e^{3/2}}-\frac{\left(b\sqrt{-d}\right)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2e^{3/2}}+\frac{\left(b\sqrt{-d}\right)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2e^{3/2}}$$

$$= \frac{ax}{e} + \frac{b\sqrt{1-c^2x^2}}{ce} + \frac{bx\arcsin(cx)}{e} + \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}} - \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}} + \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{3/2}} - \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{3/2}} + \frac{\left(ib\sqrt{-d}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^{3/2}} - \frac{\left(ib\sqrt{-d}\right)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^{3/2}} + \frac{\left(ib\sqrt{-d}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^{3/2}} - \frac{\left(ib\sqrt{-d}\right)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^{3/2}}$$

$$= \frac{ax}{e} + \frac{b\sqrt{1-c^2x^2}}{ce} + \frac{bx\arcsin(cx)}{e} + \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}} - \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}} + \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{3/2}} - \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{3/2}} + \frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}} - \frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^{3/2}} + \frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{3/2}} - \frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^{3/2}}$$

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 456, normalized size of antiderivative = 0.79

$$\int \frac{x^2(a+b\arcsin(cx))}{d+ex^2}\,dx$$
$$= \frac{4ac\sqrt{e}x - 4ac\sqrt{d}\arctan\left(\frac{\sqrt{e}x}{\sqrt{d}}\right) + b\Big(4\sqrt{e}\big(\sqrt{1-c^2x^2}+cx\arcsin(cx)\big) + c\sqrt{d}\Big(\arcsin(cx)\left(\arcsin(cx)+2i\right.}{}$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] (4*a*c*Sqrt[e]*x - 4*a*c*Sqrt[d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]] + b*(4*Sqrt[e]
*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]) + c*Sqrt[d]*(ArcSin[c*x]*(ArcSin[c*x
] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e]
)] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) +
 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])]
 + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])
)]) - c*Sqrt[d]*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcS
in[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])))/(4*c*e^(3/2))
```

Maple [C] (verified)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 8.65 (sec) , antiderivative size = 285, normalized size of antiderivative = 0.49

method	result
parts	$\frac{ax}{e} - \frac{ad\arctan\left(\frac{ex}{\sqrt{de}}\right)}{e\sqrt{de}} + \frac{b\sqrt{-c^2x^2+1}}{ce} + \frac{bx\arcsin(cx)}{e} - \frac{bcd\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)} \frac{i\arcsin(cx)}{}\right.}{}$
derivativedivides	$\frac{\frac{a\,c^3x}{e} - \frac{a\,c^3d\arctan\left(\frac{ex}{\sqrt{de}}\right)}{e\sqrt{de}} + \frac{b\,c^2\sqrt{-c^2x^2+1}}{e} + \frac{b\,c^3\arcsin(cx)x}{e} + \frac{b\,c^4d\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)} \frac{i\arcsin(cx)\ln}{}\right.}{2}}{}$
default	$\frac{\frac{a\,c^3x}{e} - \frac{a\,c^3d\arctan\left(\frac{ex}{\sqrt{de}}\right)}{e\sqrt{de}} + \frac{b\,c^2\sqrt{-c^2x^2+1}}{e} + \frac{b\,c^3\arcsin(cx)x}{e} + \frac{b\,c^4d\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)} \frac{i\arcsin(cx)\ln}{}\right.}{2}}{}$

```
[In] int(x^2*(a+b*arcsin(c*x))/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] a*x/e-a*d/e/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+b*(-c^2*x^2+1)^(1/2)/c/e+b*
x*arcsin(c*x)/e-1/2*b*c/e*d*sum(1/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln
((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_
R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-1/2*b*c/e*d*sum(_R1/(_R1^2*e
-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R
1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{d+ex^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^2}{ex^2+d}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^2*arcsin(c*x) + a*x^2)/(e*x^2 + d), x)
```

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{d+ex^2}\,dx = \int \frac{x^2(a+b\operatorname{asin}(cx))}{d+ex^2}\,dx$$

```
[In] integrate(x**2*(a+b*asin(c*x))/(e*x**2+d),x)
```

```
[Out] Integral(x**2*(a + b*asin(c*x))/(d + e*x**2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{x^2(a+b\arcsin(cx))}{d+ex^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F(-2)]

Exception generated.

$$\int \frac{x^2(a+b\arcsin(cx))}{d+ex^2}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vect
eur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))}{d+ex^2}\,dx = \int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))}{e\,x^2+d}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x)))/(d + e*x^2),x)
```

```
[Out] int((x^2*(a + b*asin(c*x)))/(d + e*x^2), x)
```

3.627 $\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 491

$$\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx = -\frac{i(a+b\arcsin(cx))^2}{2be} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e} - \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e} - \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e}$$

```
[Out] -1/2*I*(a+b*arcsin(c*x))^2/b/e+1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+
1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e+1/2*(a+b*arcsin(c*x))
*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/
```

```
e+1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(
1/2)+(c^2*d+e)^(1/2)))/e+1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/
2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e-1/2*I*b*polylog(2,-(I*c*x+(
-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e-1/2*I*b*poly
log(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/
e-1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^
2*d+e)^(1/2)))/e-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*
(-d)^(1/2)+(c^2*d+e)^(1/2)))/e
```

Rubi [A] (verified)

Time = 0.50 (sec) , antiderivative size = 491, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.316$, Rules used = {4817, 4825, 4617, 2221, 2317, 2438}

$$\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx = \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e} - \frac{i(a+b\arcsin(cx))^2}{2be} - \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e} - \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e}$$

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] ((-1/2*I)*(a + b*ArcSin[c*x])^2)/(b*e) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e) + ((a + b*A
rcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d
 + e])])/(2*e) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e) - ((I/2)*b*
```

```
PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))]
)/e - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[
c^2*d + e])])/e - ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] + Sqrt[c^2*d + e]))])/e - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c
*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/e
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \left(-\frac{a+b\arcsin(cx)}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\arcsin(cx)}{2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx$$

$$= -\frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2\sqrt{e}}+\frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2\sqrt{e}}$$

$$= -\frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2\sqrt{e}}+\frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2\sqrt{e}}$$

$$= -\frac{i(a+b\arcsin(cx))^2}{2be}-\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{e}}$$
$$-\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{e}}$$
$$+\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{e}}$$
$$+\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{e}}$$

$$= -\frac{i(a+b\arcsin(cx))^2}{2be}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e}$$
$$+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e}$$
$$+\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e}$$
$$+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e}$$
$$-\frac{b\text{Subst}\left(\int \log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{2e}$$
$$-\frac{b\text{Subst}\left(\int \log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{2e}$$
$$-\frac{b\text{Subst}\left(\int \log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{2e}$$
$$-\frac{b\text{Subst}\left(\int \log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{2e}$$

$$= -\frac{i(a+b\arcsin(cx))^2}{2be} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e} + \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e} + \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e} + \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e} + \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e}$$

$$= -\frac{i(a+b\arcsin(cx))^2}{2be} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e} - \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e} - \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 399, normalized size of antiderivative = 0.81

$$\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx = -\frac{i\left(b\arcsin(cx)^2+ib\arcsin(cx)\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+ib\arcsin(cx)\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+ib\arcsin(cx\right.}{}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
```

```
[Out] ((-1/2*I)*(b*ArcSin[c*x]^2 + I*b*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c
*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + I*b*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(
I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + I*b*ArcSin[c*x]*Log[1 -
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] + I*b*ArcSin[c*
x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] + I*a
*Log[d + e*x^2] + b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqr
t[c^2*d + e])] + b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + S
qrt[c^2*d + e])] + b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] +
Sqrt[c^2*d + e]))] + b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] +
Sqrt[c^2*d + e])]))/e
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.59 (sec) , antiderivative size = 1965, normalized size of antiderivative = 4.00

method	result	size
derivativedivides	Expression too large to display	1965
default	Expression too large to display	1965
parts	Expression too large to display	1966

```
[In] int(x*(a+b*arcsin(c*x))/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^2*(1/2*a*c^2/e*ln(c^2*e*x^2+c^2*d)+b*c^2*(-1/2*I*(2*c^2*d-2*(d*c^2*(c^2
*d+e))^(1/2)+e)*arcsin(c*x)^2/e^2-(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c
^4+2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)/e^3*d*c^2/(c^2*d+e)*ln(1-e*(I*c*x+(
-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)+(2*
c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)/e^3*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/
(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*c^2*d*arcsin(c*x)+1/4*I*(d*c^2*(c^2*
d+e))^(1/2)/e/(c^2*d+e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2
*(d*c^2*(c^2*d+e))^(1/2)+e))+I*(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+
2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*arcsin(c*x)^2/e^2/(c^2*d+e)-1/2*(d*c^2
*(c^2*d+e))^(1/2)/e/(c^2*d+e)*arcsin(c*x)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))
```

```
^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))-1/4*(d*c^2*(c^2*d+e))^(1/2)/d/c^2
/(c^2*d+e)*arcsin(c*x)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^
2*(c^2*d+e))^(1/2)+e))-1/4*(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^
2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)/e/d/c^2/(c^2*d+e)*ln(1-e*(I*c*x+(-c^2*x^2+
1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)+1/8*I*(d*c^2
*(c^2*d+e))^(1/2)/d/c^2/(c^2*d+e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/
(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))+1/2*I*(d*c^2*(c^2*d+e))^(1/2)/e/(c^2
*d+e)*arcsin(c*x)^2+1/2*I*(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2
*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2
*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^2/(c^2*d+e)-(-2*(d*c^2*(c^2*d+e))^(1
/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)/e^2/(c^2*d+e)*ln(1
-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcs
in(c*x)-1/4*I*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)*polylog(2,e*(I*c*x+(-c^
2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^2+1/2*(2*c^2*d-2
*(d*c^2*(c^2*d+e))^(1/2)+e)/e^2*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*
d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)+1/4*I*(-2*(d*c^2*(c^2*d+e))^(1/
2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*arcsin(c*x)^2/e/d/c
^2/(c^2*d+e)+1/4*I*(d*c^2*(c^2*d+e))^(1/2)/d/c^2/(c^2*d+e)*arcsin(c*x)^2-1/
2*I*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(
1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))*d*c^2/e^3+1/8*I*(-2*(d*c^2*(
c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*polylo
g(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/e
/d/c^2/(c^2*d+e)-1/2*I*arcsin(c*x)^2/e-I*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)
+e)*arcsin(c*x)^2*d*c^2/e^3+1/2*I*(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c
^4+2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*d*c^2*polylog(2,e*(I*c*x+(-c^2*x^2+
1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^3/(c^2*d+e)+I*(-2*(d*c
^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*d*
c^2*arcsin(c*x)^2/e^3/(c^2*d+e)-1/2*I/e*sum((-_R1^2*e+4*c^2*d+2*e)/(-_R1^2*
e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_
R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e)
)))
```

Fricas [F]

$$\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx = \int \frac{(b\arcsin{(cx)}+a)x}{ex^2+d}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
[Out] integral((b*x*arcsin(c*x) + a*x)/(e*x^2 + d), x)
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx=\int \frac{x(a+b\,\mathrm{asin}\,(cx))}{d+ex^2}\,dx$$

[In] integrate(x*(a+b*asin(c*x))/(e*x**2+d),x)

[Out] Integral(x*(a + b*asin(c*x))/(d + e*x**2), x)

Maxima [F]

$$\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx=\int \frac{(b\arcsin(cx)+a)x}{ex^2+d}\,dx$$

[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")

[Out] b*integrate(x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x^2 + d), x) + 1/2*a*log(e*x^2 + d)/e

Giac [F]

$$\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx=\int \frac{(b\arcsin(cx)+a)x}{ex^2+d}\,dx$$

[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)*x/(e*x^2 + d), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx=\int \frac{x\,(a+b\,\mathrm{asin}(c\,x))}{e\,x^2+d}\,dx$$

[In] int((x*(a + b*asin(c*x)))/(d + e*x^2),x)

[Out] int((x*(a + b*asin(c*x)))/(d + e*x^2), x)

3.628 $\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 541

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx = {} & \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} \\ & -\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} \\ & +\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} \\ & -\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} \\ & +\frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} \\ & +\frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}\end{aligned}$$

```
[Out] 1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/
2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(
-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(
1/2)+1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d
)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)-1/2*(a+b*arcsin(c*x))*ln(1+(I*
c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2
)/e^(1/2)+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(
1/2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^
2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)+1/
```

```
2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+
e)^(1/2)))/(-d)^(1/2)/e^(1/2)-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*
e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)
```

Rubi [A] (verified)

Time = 0.50 (sec) , antiderivative size = 541, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4757, 4825, 4617, 2221, 2317, 2438}

$$\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx = \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2\sqrt{-d}\sqrt{e}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2),x]
```

```
[Out] ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sq
rt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[
e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e
]) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d]
 + Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])*Log[1 + (
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*Sqrt[-d]*S
qrt[e]) + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
 Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt[e]) - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I
*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(Sqrt[-d]*Sqrt[e]) + ((I/
2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d +
e]))])/(Sqrt[-d]*Sqrt[e]) - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))
/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*Sqrt[e])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \left(\frac{\sqrt{-d}(a + b\arcsin(cx))}{2d\left(\sqrt{-d} - \sqrt{e}x\right)} + \frac{\sqrt{-d}(a + b\arcsin(cx))}{2d\left(\sqrt{-d} + \sqrt{e}x\right)} \right) dx$$

$$= -\frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2\sqrt{-d}} - \frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2\sqrt{-d}}$$

$$=-\frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}}-\frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}}$$

$$=-\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}}-\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}}-\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}}-\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}}$$

$$=\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{b\text{Subst}\left(\int \log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}\sqrt{e}}+\frac{b\text{Subst}\left(\int \log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}\sqrt{e}}-\frac{b\text{Subst}\left(\int \log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}\sqrt{e}}+\frac{b\text{Subst}\left(\int \log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}\sqrt{e}}$$

$$=\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}+\frac{(ib)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{(ib)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2\sqrt{-d}\sqrt{e}}+\frac{(ib)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{(ib)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2\sqrt{-d}\sqrt{e}}$$

$$=\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}+\frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}+\frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}-\frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}$$

Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 490, normalized size of antiderivative = 0.91

$$\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx$$
$$= \frac{2a\sqrt{-d}\arctan\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)-b\sqrt{d}\arcsin(cx)\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)+b\sqrt{d}\arcsin(cx)\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2),x]
```

```
[Out] (2*a*Sqrt[-d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]] - b*Sqrt[d]*ArcSin[c*x]*Log[1 + (
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] + b*Sqrt[d]*Ar
cSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d
 + e])] + b*Sqrt[d]*ArcSin[c*x]*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] + Sqrt[c^2*d + e])] - b*Sqrt[d]*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])] - I*b*Sqrt[d]*PolyLog[2, (Sqr
t[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] + I*b*Sqrt[d]*Pol
yLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d + e])] +
I*b*Sqrt[d]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c
^2*d + e]))] - I*b*Sqrt[d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] + Sqrt[c^2*d + e])])/(2*Sqrt[-d^2]*Sqrt[e])
```

Maple [C] (verified)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.99 (sec) , antiderivative size = 236, normalized size of antiderivative = 0.44

method	result
parts	$\frac{a \arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}} + \frac{bc\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)} \frac{i \arcsin(cx)\ln\left(\frac{\_R1-icx-\sqrt{-c^2x^2+1}}{\_R1}\right)+\mathrm{dilog}\left(\frac{\_R1}{}\right.}{\_R1\left(\_R1^2e-2c^2d-e\right)}\right.}{2}$
derivativedivides	$\frac{\frac{ac\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}}+bc^2\left(-\frac{\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)} \frac{i\arcsin(cx)\ln\left(\frac{\_R1-icx-\sqrt{-c^2x^2+1}}{\_R1}\right)+\mathrm{dilog}\left(-\right.}{\_R1\left(-\_R1^2e+2c^2d+e\right)}\right.}{2}\right.}{}$
default	$\frac{\frac{ac\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}}+bc^2\left(-\frac{\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)} \frac{i\arcsin(cx)\ln\left(\frac{\_R1-icx-\sqrt{-c^2x^2+1}}{\_R1}\right)+\mathrm{dilog}\left(-\right.}{\_R1\left(-\_R1^2e+2c^2d+e\right)}\right.}{2}\right.}{}$

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] a/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+1/2*b*c*sum(1/_R1/(_R1^2*e-2*c^2*d-e)
*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c
^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/2*b*c*su
m(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/
_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d
-2*e)*_Z^2+e))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx = \int \frac{b\arcsin(cx)+a}{ex^2+d}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e*x^2 + d), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx = \int \frac{a+b\,\mathrm{asin}\,(cx)}{d+ex^2}\,dx$$

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d),x)
[Out] Integral((a + b*asin(c*x))/(d + e*x**2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx = \int \frac{b\arcsin(cx)+a}{ex^2+d}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{e\,x^2+d}\,dx$$

```
[In] int((a + b*asin(c*x))/(d + e*x^2),x)
[Out] int((a + b*asin(c*x))/(d + e*x^2), x)
```

3.629 $\int \frac{a+b\arcsin(cx)}{x(d+ex^2)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 518

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x(d+ex^2)}\,dx =& -\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d} \\ &-\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d} \\ &-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d} \\ &-\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d} \\ &+\frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d} \\ &+\frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d} \\ &+\frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d}+\frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d} \\ &+\frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d}-\frac{ib\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d}\end{aligned}$$

```
[Out] (a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d-1/2*(a+b*arcsin(c*x)
)*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))
/d-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^
(1/2)-(c^2*d+e)^(1/2)))/d-1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1
/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d-1/2*(a+b*arcsin(c*x))*ln(1
+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d-1/2
```

```
*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d+1/2*I*b*polylog(2,-(I*c*x+(-
c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d+1/2*I*b*polyl
og(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d
+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2
*d+e)^(1/2)))/d+1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(
-d)^(1/2)+(c^2*d+e)^(1/2)))/d
```

Rubi [A] (verified)

Time = 0.63 (sec) , antiderivative size = 518, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {4817, 4721, 3798, 2221, 2317, 2438, 4825, 4617}

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x(d+ex^2)}\,dx = &-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d}\\&-\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d}\\&-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d}\\&-\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d}\\&+\frac{\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d}\\&+\frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d}\\&+\frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d}+\frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2d}\\&+\frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2d}-\frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d + e*x^2)),x]
```

```
[Out] -1/2*((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d]
 - Sqrt[c^2*d + e])])/d - ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin
[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d) - ((a + b*ArcSin[c*x])*Log
[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d) -
 ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/(2*d) + ((a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x]
)])/d + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - S
qrt[c^2*d + e]))])/d + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] - Sqrt[c^2*d + e])])/d + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcS
```

```
in[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d + ((I/2)*b*PolyLog[2, (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d - ((I/2)*b*Poly
Log[2, E^((2*I)*ArcSin[c*x])])/d
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
```

```
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a+b\arcsin(cx)}{dx} - \frac{ex(a+b\arcsin(cx))}{d(d+ex^2)}\right) dx$$

$$= \frac{\int \frac{a+b\arcsin(cx)}{x}\,dx}{d} - \frac{e\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx}{d}$$

$$= \frac{\text{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \arcsin(cx)\right)}{d} - \frac{e\int \left(-\frac{a+b\arcsin(cx)}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{a+b\arcsin(cx)}{2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}\right) dx}{d}$$

$$= -\frac{i(a+b\arcsin(cx))^2}{2bd} - \frac{(2i)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)}{d} + \frac{\sqrt{e}\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2d} - \frac{\sqrt{e}\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2d}$$

$$= -\frac{i(a+b\arcsin(cx))^2}{2bd} + \frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d} - \frac{b\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d} + \frac{\sqrt{e}\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{2d} - \frac{\sqrt{e}\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{2d}$$

$$= \frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d} + \frac{(ib)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2d} + \frac{\left(i\sqrt{e}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2d} + \frac{\left(i\sqrt{e}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2d} - \frac{\left(i\sqrt{e}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2d} - \frac{\left(i\sqrt{e}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2d}$$

$$= -\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d} - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d} + \frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d} - \frac{ib\,\text{PolyLog}\left(2, e^{2i\arcsin(cx)}\right)}{2d} + \frac{b\text{Subst}\left(\int \log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2d} + \frac{b\text{Subst}\left(\int \log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2d} + \frac{b\text{Subst}\left(\int \log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2d} + \frac{b\text{Subst}\left(\int \log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2d}$$

$$= -\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d} - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d} + \frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d} - \frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d} - \frac{(ib)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2d} - \frac{(ib)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2d} - \frac{(ib)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2d} - \frac{(ib)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2d}$$

$$= -\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d} - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d} + \frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d} + \frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d} + \frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d} + \frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d} + \frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d} - \frac{ib\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d}$$

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 430, normalized size of antiderivative = 0.83

$$\int \frac{a+b\arcsin(cx)}{x\,(d+ex^2)}\,dx = -\frac{b\arcsin(cx)\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+b\arcsin(cx)\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+b\arcsin(cx)\log\left(1-\frac{\sqrt{e}e^{i\arcsin}}{c\sqrt{d}+\sqrt{c^2}}\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d + e*x^2)),x]
```

```
[Out] -1/2*(b*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c
^2*d + e])] + b*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d
]) + Sqrt[c^2*d + e])] + b*ArcSin[c*x]*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/
(c*Sqrt[d] + Sqrt[c^2*d + e])] + b*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin
[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] - 2*b*ArcSin[c*x]*Log[1 - E^((2*I)*A
rcSin[c*x])] - 2*a*Log[x] + a*Log[d + e*x^2] - I*b*PolyLog[2, (Sqrt[e]*E^(I
*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] - I*b*PolyLog[2, (Sqrt[e]*E^(
I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] - I*b*PolyLog[2, -((Sqrt[
e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))] - I*b*PolyLog[2, (Sqr
t[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] + I*b*PolyLog[2, E^(
(2*I)*ArcSin[c*x])])/d
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 1.66 (sec) , antiderivative size = 344, normalized size of antiderivative = 0.66

method	result
parts	$\frac{a\ln(x)}{d}-\frac{a\ln(e\,x^2+d)}{2d}+b\left(\frac{i\,\mathrm{dilog}\left(icx+\sqrt{-c^2x^2+1}\right)}{d}+\frac{i\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\frac{\left(\_R1^2e-4\ldots\right.}{\ldots}\right.}{\ldots}\right.$
derivativedivides	$\frac{a\ln(cx)}{d}-\frac{a\ln(c^2e\,x^2+c^2d)}{2d}+\frac{ib\,\mathrm{dilog}\left(icx+\sqrt{-c^2x^2+1}\right)}{d}+\frac{ib\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\frac{\left(-\_R1\ldots\right.}{\ldots}\right.}{\ldots}$
default	$\frac{a\ln(cx)}{d}-\frac{a\ln(c^2e\,x^2+c^2d)}{2d}+\frac{ib\,\mathrm{dilog}\left(icx+\sqrt{-c^2x^2+1}\right)}{d}+\frac{ib\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\frac{\left(-\_R1\ldots\right.}{\ldots}\right.}{\ldots}$

```
[In] int((a+b*arcsin(c*x))/x/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] a/d*ln(x)-1/2*a/d*ln(e*x^2+d)+b*(I/d*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+1/4*I/
d*sum((_R1^2*e-4*c^2*d-e)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-
(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=Roo
tOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/d*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^
(1/2))-I/d*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+1/4*I*e/d*sum((_R1^2-1)/(_R1^2
*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((
_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e
)))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x\,(d+ex^2)}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{(ex^2+d)x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e*x^3 + d*x), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x(d+ex^2)}\,dx = \int \frac{a+b\operatorname{asin}{(cx)}}{x(d+ex^2)}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x/(e*x**2+d),x)
```

```
[Out] Integral((a + b*asin(c*x))/(x*(d + e*x**2)), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x(d+ex^2)}\,dx = \int \frac{b\arcsin{(cx)}+a}{(ex^2+d)x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(log(e*x^2 + d)/d - 2*log(x)/d) + b*integrate(arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))/(e*x^3 + d*x), x)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x(d+ex^2)}\,dx = \int \frac{b\arcsin{(cx)}+a}{(ex^2+d)x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/((e*x^2 + d)*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x(d+ex^2)}\,dx = \int \frac{a+b\operatorname{asin}(c\,x)}{x\,(e\,x^2+d)}\,dx$$

```
[In] int((a + b*asin(c*x))/(x*(d + e*x^2)),x)
```

```
[Out] int((a + b*asin(c*x))/(x*(d + e*x^2)), x)
```

3.630 $\int \frac{a+b\arcsin(cx)}{x^2(d+ex^2)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 579

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x^2(d+ex^2)}\,dx = &-\frac{a+b\arcsin(cx)}{dx}-\frac{b\text{carctanh}\left(\sqrt{1-c^2x^2}\right)}{d}\\
&+\frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}\\
&-\frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}\\
&+\frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}\\
&-\frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}\\
&+\frac{ib\sqrt{e}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}\\
&-\frac{ib\sqrt{e}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}\\
&+\frac{ib\sqrt{e}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}\\
&-\frac{ib\sqrt{e}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}\end{aligned}$$

```
[Out] (-a-b*arcsin(c*x))/d/x-b*c*arctanh((-c^2*x^2+1)^(1/2))/d+1/2*(a+b*arcsin(c*
x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)
```

```
))*e^(1/2)/(-d)^(3/2)-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))
*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(3/2)+1/2*(a+b*arcs
in(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^
(1/2)))*e^(1/2)/(-d)^(3/2)-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(
1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(3/2)+1/2*I*b*
polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/
2)))*e^(1/2)/(-d)^(3/2)-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2
)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(3/2)+1/2*I*b*polylog(2,-(
I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*e^(1/2)
/(-d)^(3/2)-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^
(1/2)+(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(3/2)
```

Rubi [A] (verified)

Time = 0.63 (sec) , antiderivative size = 579, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.524, Rules used = {4817, 4723, 272, 65, 214, 4757, 4825, 4617, 2221, 2317, 2438}

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x^2(d+ex^2)}\,dx =& \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{3/2}}\\&-\frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{3/2}}\\&+\frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{3/2}}\\&-\frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{3/2}}\\&-\frac{a+b\arcsin(cx)}{dx}+\frac{ib\sqrt{e}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2(-d)^{3/2}}\\&-\frac{ib\sqrt{e}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2(-d)^{3/2}}\\&+\frac{ib\sqrt{e}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2(-d)^{3/2}}\\&-\frac{ib\sqrt{e}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2(-d)^{3/2}}-\frac{bc\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d + e*x^2)),x]
```

```
[Out] -((a + b*ArcSin[c*x])/(d*x)) - (b*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d + (Sqrt[e
]*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - S
```

```
qrt[c^2*d + e])])/(2*(-d)^(3/2)) - (Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 + (Sq
rt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*(-d)^(3/2))
+ (Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqr
t[-d] + Sqrt[c^2*d + e])])/(2*(-d)^(3/2)) - (Sqrt[e]*(a + b*ArcSin[c*x])*Lo
g[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*(-d
)^(3/2)) + ((I/2)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*S
qrt[-d] - Sqrt[c^2*d + e]))])/(-d)^(3/2) - ((I/2)*b*Sqrt[e]*PolyLog[2, (Sqr
t[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(-d)^(3/2) + ((I
/2)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt
[c^2*d + e]))])/(-d)^(3/2) - ((I/2)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*E^(I*ArcS
in[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(-d)^(3/2)
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a+b\arcsin(cx)}{dx^2} - \frac{e(a+b\arcsin(cx))}{d(d+ex^2)}\right) dx$$

$$= \frac{\int \frac{a+b\arcsin(cx)}{x^2}\,dx}{d} - \frac{e\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx}{d}$$

$$= -\frac{a+b\arcsin(cx)}{dx} + \frac{(bc)\int \frac{1}{x\sqrt{1-c^2x^2}}\,dx}{d} - \frac{e\int \left(\frac{\sqrt{-d}(a+b\arcsin(cx))}{2d(\sqrt{-d}-\sqrt{e}x)} + \frac{\sqrt{-d}(a+b\arcsin(cx))}{2d(\sqrt{-d}+\sqrt{e}x)}\right)dx}{d}$$

$$= -\frac{a+b\arcsin(cx)}{dx} + \frac{(bc)\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx, x, x^2\right)}{2d} - \frac{e\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2(-d)^{3/2}} - \frac{e\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2(-d)^{3/2}}$$

$$= -\frac{a+b\arcsin(cx)}{dx} - \frac{b\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{cd} - \frac{e\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{2(-d)^{3/2}} - \frac{e\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{2(-d)^{3/2}}$$

$$= -\frac{a+b\arcsin(cx)}{dx} - \frac{b\text{carctanh}\left(\sqrt{1-c^2x^2}\right)}{d} - \frac{(ie)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2(-d)^{3/2}} - \frac{(ie)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2(-d)^{3/2}} - \frac{(ie)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2(-d)^{3/2}} - \frac{(ie)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2(-d)^{3/2}}$$

$$=-\frac{a+b\arcsin(cx)}{dx}-\frac{b\text{carctanh}\left(\sqrt{1-c^2x^2}\right)}{d}$$
$$+\frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}$$
$$-\frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}$$
$$+\frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}$$
$$-\frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}$$
$$-\frac{\left(b\sqrt{e}\right)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2(-d)^{3/2}}$$
$$+\frac{\left(b\sqrt{e}\right)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2(-d)^{3/2}}$$
$$-\frac{\left(b\sqrt{e}\right)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2(-d)^{3/2}}$$
$$+\frac{\left(b\sqrt{e}\right)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2(-d)^{3/2}}$$

$$= -\frac{a+b\arcsin(cx)}{dx} - \frac{b\text{carctanh}\left(\sqrt{1-c^2x^2}\right)}{d}$$
$$+ \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}$$
$$- \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}$$
$$+ \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}$$
$$- \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}$$
$$+ \frac{\left(ib\sqrt{e}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2(-d)^{3/2}}$$
$$- \frac{\left(ib\sqrt{e}\right)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2(-d)^{3/2}}$$
$$+ \frac{\left(ib\sqrt{e}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2(-d)^{3/2}}$$
$$- \frac{\left(ib\sqrt{e}\right)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2(-d)^{3/2}}$$

$$
\begin{aligned}
&= -\frac{a+b\arcsin(cx)}{dx} - \frac{b\text{carctanh}\left(\sqrt{1-c^2x^2}\right)}{d} \\
&+ \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}} \\
&- \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}} \\
&+ \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}} \\
&- \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}} \\
&+ \frac{ib\sqrt{e}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}} - \frac{ib\sqrt{e}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}} \\
&+ \frac{ib\sqrt{e}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}} - \frac{ib\sqrt{e}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 455, normalized size of antiderivative = 0.79

$$
\int \frac{a+b\arcsin(cx)}{x^2(d+ex^2)}\,dx
$$

$$
= \frac{-4a\sqrt{d}-4a\sqrt{e}x\arctan\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)-4b\sqrt{d}\left(\arcsin(cx)+cx\text{arctanh}\left(\sqrt{1-c^2x^2}\right)\right)+b\sqrt{e}x\left(\arcsin(cx)\left(\text{arcsi}\right.\right.}{}
$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d + e*x^2)),x]
```

```
[Out] (-4*a*Sqrt[d] - 4*a*Sqrt[e]*x*ArcTan[(Sqrt[e]*x)/Sqrt[d]] - 4*b*Sqrt[d]*(Ar
cSin[c*x] + c*x*ArcTanh[Sqrt[1 - c^2*x^2]]) + b*Sqrt[e]*x*(ArcSin[c*x]*(Arc
Sin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2
*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e
])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d
 + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*
d + e]))]) - b*Sqrt[e]*x*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e
]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E
^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*
E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E
^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]))/(4*d^(3/2)*x)
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 5.68 (sec) , antiderivative size = 363, normalized size of antiderivative = 0.63

method	result
parts	$-\frac{a}{dx}-\frac{ae\arctan\left(\frac{ex}{\sqrt{de}}\right)}{d\sqrt{de}}+bc\left(-\frac{\arcsin(cx)}{cxd}+\frac{e\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\frac{\left(\_R1^2e-4c^2d-e\right)\left(\right.}{}\right.}{}\right.$
derivativedivides	$c\left(-\frac{a}{dcx}-\frac{ae\arctan\left(\frac{ex}{\sqrt{de}}\right)}{cd\sqrt{de}}-\frac{b\arcsin(cx)}{cxd}-\frac{b\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)}{d}+\frac{b\ln\left(icx+\sqrt{-c^2x^2+1}-1\right)}{d}+\frac{be\left(\_R\right.}{}\right.$
default	$c\left(-\frac{a}{dcx}-\frac{ae\arctan\left(\frac{ex}{\sqrt{de}}\right)}{cd\sqrt{de}}-\frac{b\arcsin(cx)}{cxd}-\frac{b\ln\left(1+icx+\sqrt{-c^2x^2+1}\right)}{d}+\frac{b\ln\left(icx+\sqrt{-c^2x^2+1}-1\right)}{d}+\frac{be\left(\_R\right.}{}\right.$

```
[In] int((a+b*arcsin(c*x))/x^2/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] -a/d/x-a*e/d/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+b*c*(-1/c/x*arcsin(c*x)/d+
1/8/d^2*e/c^2*sum((_R1^2*e-4*c^2*d-e)/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x
)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2
))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-1/8/d^2*e/c^2*sum((4*_R1
^2*c^2*d+_R1^2*e-e)/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-
c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootO
f(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/d*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)-1/d*ln(
1+I*c*x+(-c^2*x^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^2(d+ex^2)}\,dx=\int \frac{b\arcsin(cx)+a}{(ex^2+d)x^2}\,dx$$

[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d),x, algorithm="fricas")

[Out] integral((b*arcsin(c*x) + a)/(e*x^4 + d*x^2), x)

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^2(d+ex^2)}\,dx=\int \frac{a+b\,\mathrm{asin}(cx)}{x^2(d+ex^2)}\,dx$$

[In] integrate((a+b*asin(c*x))/x**2/(e*x**2+d),x)

[Out] Integral((a + b*asin(c*x))/(x**2*(d + e*x**2)), x)

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{x^2(d+ex^2)}\,dx=\text{Exception raised: ValueError}$$

[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d),x, algorithm="maxima")

[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see 'assume?' for more detai
ls)Is e

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x^2(d+ex^2)}\,dx=\int \frac{b\arcsin(cx)+a}{(ex^2+d)x^2}\,dx$$

[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d),x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)/((e*x^2 + d)*x^2), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^2\,(d+ex^2)}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^2\,\left(e\,x^2+d\right)}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^2*(d + e*x^2)),x)
[Out] int((a + b*asin(c*x))/(x^2*(d + e*x^2)), x)
```

3.631 $\int \frac{a+b\arcsin(cx)}{x^3(d+ex^2)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 573

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x^3(d+ex^2)}\,dx &= -\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\arcsin(cx)}{2dx^2}\\ &+\frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}\\ &+\frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}\\ &+\frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}\\ &+\frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}\\ &-\frac{e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^2}\\ &-\frac{ibe\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}\\ &-\frac{ibe\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}-\frac{ibe\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}\\ &-\frac{ibe\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}+\frac{ibe\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^2}\end{aligned}$$

```
[Out] 1/2*(-a-b*arcsin(c*x))/d/x^2-e*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(
1/2))^2)/d^2+1/2*e*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2
)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2+1/2*e*(a+b*arcsin(c*x))*ln(1+(I*c*x
```

```
+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2+1/2*e*(a
+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^
2*d+e)^(1/2)))/d^2+1/2*e*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*
e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^2+1/2*I*b*e*polylog(2,(I*c*x+(-
c^2*x^2+1)^(1/2))^2)/d^2-1/2*I*b*e*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^
(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2-1/2*I*b*e*polylog(2,(I*c*x+(-c^
2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2-1/2*I*b*e*pol
ylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2))
)/d^2-1/2*I*b*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2
)+(c^2*d+e)^(1/2)))/d^2-1/2*b*c*(-c^2*x^2+1)^(1/2)/d/x
```

Rubi [A] (verified)

Time = 0.69 (sec) , antiderivative size = 573, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {4817, 4723, 270, 4721, 3798, 2221, 2317, 2438, 4825, 4617}

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)}\,dx &= \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2} \\ &+\frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2} \\ &+\frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2} \\ &+\frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2} \\ &-\frac{e\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2}-\frac{a+b\arcsin(cx)}{2dx^2} \\ &-\frac{ibe\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d^2}-\frac{ibe\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d^2} \\ &-\frac{ibe\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2d^2}-\frac{ibe\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2d^2} \\ &+\frac{ibe\operatorname{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^2}-\frac{bc\sqrt{1-c^2x^2}}{2dx}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)),x]
```

```
[Out] -1/2*(b*c*Sqrt[1 - c^2*x^2])/(d*x) - (a + b*ArcSin[c*x])/(2*d*x^2) + (e*(a
+ b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c
^2*d + e])])/(2*d^2) + (e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[
c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d^2) + (e*(a + b*ArcSin[c*x])*
Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d
```

```
^2) + (e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[
-d] + Sqrt[c^2*d + e])]])/(2*d^2) - (e*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*
ArcSin[c*x])]])/d^2 - ((I/2)*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] - Sqrt[c^2*d + e]))]])/d^2 - ((I/2)*b*e*PolyLog[2, (Sqrt[e]*E^(I
*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])]])/d^2 - ((I/2)*b*e*PolyLog[
2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))]])/d^2 -
((I/2)*b*e*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*
d + e])]])/d^2 + ((I/2)*b*e*PolyLog[2, E^((2*I)*ArcSin[c*x])]])/d^2
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
```

```
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{a+b\arcsin(cx)}{dx^3} - \frac{e(a+b\arcsin(cx))}{d^2x} + \frac{e^2x(a+b\arcsin(cx))}{d^2(d+ex^2)}\right) dx \\
&= \frac{\int \frac{a+b\arcsin(cx)}{x^3}\,dx}{d} - \frac{e\int \frac{a+b\arcsin(cx)}{x}\,dx}{d^2} + \frac{e^2\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx}{d^2} \\
&= -\frac{a+b\arcsin(cx)}{2dx^2} + \frac{(bc)\int \frac{1}{x^2\sqrt{1-c^2x^2}}\,dx}{2d} \\
&\quad - \frac{e\text{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \arcsin(cx)\right)}{d^2} \\
&\quad + \frac{e^2\int \left(-\frac{a+b\arcsin(cx)}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{a+b\arcsin(cx)}{2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{d^2}
\end{aligned}$$

$$=-\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\arcsin(cx)}{2dx^2}+\frac{ie(a+b\arcsin(cx))^2}{2bd^2}$$
$$+\frac{(2ie)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right)}{d^2}$$
$$-\frac{e^{3/2}\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2d^2}+\frac{e^{3/2}\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2d^2}$$
$$=-\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\arcsin(cx)}{2dx^2}+\frac{ie(a+b\arcsin(cx))^2}{2bd^2}$$
$$-\frac{e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^2}$$
$$+\frac{(be)\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d^2}$$
$$-\frac{e^{3/2}\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2d^2}$$
$$+\frac{e^{3/2}\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2d^2}$$
$$=-\frac{bc\sqrt{1-c^2x^2}}{2dx}-\frac{a+b\arcsin(cx)}{2dx^2}-\frac{e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^2}$$
$$-\frac{(ibe)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{2d^2}$$
$$-\frac{\left(ie^{3/2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2d^2}$$
$$-\frac{\left(ie^{3/2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2d^2}$$
$$+\frac{\left(ie^{3/2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2d^2}$$
$$+\frac{\left(ie^{3/2}\right)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2d^2}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\arcsin(cx)}{2dx^2} + \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}$$
$$+ \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}$$
$$+ \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}$$
$$+ \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}$$
$$- \frac{e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^2} + \frac{ibe\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^2}$$
$$- \frac{(be)\mathrm{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2d^2}$$
$$- \frac{(be)\mathrm{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2d^2}$$
$$- \frac{(be)\mathrm{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2d^2}$$
$$- \frac{(be)\mathrm{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2d^2}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\arcsin(cx)}{2dx^2} + \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}$$
$$+ \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}$$
$$+ \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}$$
$$+ \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}$$
$$- \frac{e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^2} + \frac{ibe\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^2}$$
$$+ \frac{(ibe)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2d^2}$$
$$+ \frac{(ibe)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2d^2}$$
$$+ \frac{(ibe)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2d^2}$$
$$+ \frac{(ibe)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{2d^2}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2dx} - \frac{a+b\arcsin(cx)}{2dx^2} + \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}$$
$$+ \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}$$
$$+ \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}$$
$$+ \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}$$
$$- \frac{e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^2} - \frac{ibe\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}$$
$$- \frac{ibe\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2} - \frac{ibe\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}$$
$$- \frac{ibe\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2} + \frac{ibe\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^2}$$

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 509, normalized size of antiderivative = 0.89

$$\int \frac{a+b\arcsin(cx)}{x^3(d+ex^2)}\,dx$$
$$= -\frac{a}{2dx^2} - \frac{ae\log(x)}{d^2} + \frac{ae\log(d+ex^2)}{2d^2} + b\left(-\frac{cx\sqrt{1-c^2x^2}+\arcsin(cx)}{2dx^2}\right.$$
$$- \frac{ie\left(\arcsin(cx)\left(\arcsin(cx)+2i\left(\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arc\ldots}}{-c\sqrt{d}+\ldots}\right.\ldots}{4d^2}$$
$$- \frac{ie\left(\arcsin(cx)\left(\arcsin(cx)+2i\left(\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\,\ldots}}{c\sqrt{d}-\ldots}\right.\ldots}{4d^2}$$
$$\left.- \frac{e\left(\arcsin(cx)\log\left(1-e^{2i\arcsin(cx)}\right)-\frac{1}{2}i\left(\arcsin(cx)^2+\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)\right)\right)}{d^2}\right)$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)),x]
```

```
[Out] -1/2*a/(d*x^2) - (a*e*Log[x])/d^2 + (a*e*Log[d + e*x^2])/(2*d^2) + b*(-1/2*
(c*x*Sqrt[1 - c^2*x^2] + ArcSin[c*x])/(d*x^2) - ((I/4)*e*(ArcSin[c*x]*(ArcS
in[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*
d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]
)])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d
+ e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d
```

```
 + e]))]]))/d^2 - ((I/4)*e*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[
e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*
E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]
*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*
E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]))/d^2 - (e*(ArcSin[c*x]*L
og[1 - E^((2*I)*ArcSin[c*x])] - (I/2)*(ArcSin[c*x]^2 + PolyLog[2, E^((2*I)*
ArcSin[c*x])])))/d^2)
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 1.84 (sec) , antiderivative size = 421, normalized size of antiderivative = 0.73

method	result
parts	$a\left(-\frac{1}{2d\,x^{2}}-\frac{e\ln(x)}{d^{2}}+\frac{e\ln(e\,x^{2}+d)}{2d^{2}}\right)+b\,c^{2}\left(-\frac{-ic^{2}x^{2}+cx\sqrt{-c^{2}x^{2}+1}+\arcsin(cx)}{2c^{2}x^{2}d}-\frac{ie\,\mathrm{dilog}\left(icx+\sqrt{-c^{2}x^{2}\right.}}{d^{2}c^{2}}\right.$
derivativedivides	$c^{2}\left(-\frac{a}{2d\,c^{2}x^{2}}-\frac{ae\ln(cx)}{c^{2}d^{2}}+\frac{ae\ln(c^{2}e\,x^{2}+c^{2}d)}{2c^{2}d^{2}}+b\,c^{2}\left(-\frac{-ic^{2}x^{2}+cx\sqrt{-c^{2}x^{2}+1}+\arcsin(cx)}{2c^{4}x^{2}d}-\frac{ie\,\mathrm{dilog}\left(icx\right.}{d}\right.\right.$
default	$c^{2}\left(-\frac{a}{2d\,c^{2}x^{2}}-\frac{ae\ln(cx)}{c^{2}d^{2}}+\frac{ae\ln(c^{2}e\,x^{2}+c^{2}d)}{2c^{2}d^{2}}+b\,c^{2}\left(-\frac{-ic^{2}x^{2}+cx\sqrt{-c^{2}x^{2}+1}+\arcsin(cx)}{2c^{4}x^{2}d}-\frac{ie\,\mathrm{dilog}\left(icx\right.}{d}\right.\right.$

```
[In] int((a+b*arcsin(c*x))/x^3/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/2/d/x^2-e/d^2*ln(x)+1/2*e/d^2*ln(e*x^2+d))+b*c^2*(-1/2*(-I*c^2*x^2+c*
x*(-c^2*x^2+1)^(1/2)+arcsin(c*x))/c^2/x^2/d-I*e/d^2/c^2*dilog(I*c*x+(-c^2*x
^2+1)^(1/2))-1/4*I*e/d^2/c^2*sum((_R1^2*e-4*c^2*d-e)/(_R1^2*e-2*c^2*d-e)*(I
*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*
x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-e/d^2/c^2*arc
sin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+I*e/d^2/c^2*dilog(1+I*c*x+(-c^2*x^2
+1)^(1/2))-1/4*I*e^2/d^2/c^2*sum((_R1^2-1)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*
x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/
```

```
2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e)))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{(ex^2+d)x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d),x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)/(e*x^5 + d*x^3), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)}\,dx=\int \frac{a+b\,\mathrm{asin}\left(cx\right)}{x^3\left(d+ex^2\right)}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x**3/(e*x**2+d),x)
[Out] Integral((a + b*asin(c*x))/(x**3*(d + e*x**2)), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{(ex^2+d)x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d),x, algorithm="maxima")
[Out] 1/2*a*(e*log(e*x^2 + d)/d^2 - 2*e*log(x)/d^2 - 1/(d*x^2)) + b*integrate(arc
tan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x^5 + d*x^3), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d),x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^3\,(d+ex^2)}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^3\,\left(e\,x^2+d\right)}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^3*(d + e*x^2)),x)
[Out] int((a + b*asin(c*x))/(x^3*(d + e*x^2)), x)
```

3.632 $\int \frac{a+b\arcsin(cx)}{x^4(d+ex^2)}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 649

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x^4(d+ex^2)}\,dx =& -\frac{bc\sqrt{1-c^2x^2}}{6dx^2}-\frac{a+b\arcsin(cx)}{3dx^3}+\frac{e(a+b\arcsin(cx))}{d^2x}\\&-\frac{bc^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d}+\frac{bce\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2}\\&+\frac{e^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}\\&-\frac{e^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}\\&+\frac{e^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}\\&-\frac{e^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}\\&+\frac{ibe^{3/2}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}\\&-\frac{ibe^{3/2}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}\\&+\frac{ibe^{3/2}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}\\&-\frac{ibe^{3/2}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}\end{aligned}$$

```
[Out] 1/3*(-a-b*arcsin(c*x))/d/x^3+e*(a+b*arcsin(c*x))/d^2/x-1/6*b*c^3*arctanh((-
c^2*x^2+1)^(1/2))/d+b*c*e*arctanh((-c^2*x^2+1)^(1/2))/d^2+1/2*e^(3/2)*(a+b*
arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d
+e)^(1/2)))/(-d)^(5/2)-1/2*e^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+
1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(5/2)+1/2*e^(3/2)*
(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(
c^2*d+e)^(1/2)))/(-d)^(5/2)-1/2*e^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2
*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(5/2)+1/2*I*b
*e^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2
*d+e)^(1/2)))/(-d)^(5/2)-1/2*I*b*e^(3/2)*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2
))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(5/2)+1/2*I*b*e^(3/2)*pol
ylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2))
)/(-d)^(5/2)-1/2*I*b*e^(3/2)*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(
I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(5/2)-1/6*b*c*(-c^2*x^2+1)^(1/2)/d/x^
2
```

Rubi [A] (verified)

Time = 0.68 (sec) , antiderivative size = 649, normalized size of antiderivative = 1.00, number of steps used = 29, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.571$, Rules

used = {4817, 4723, 272, 44, 65, 214, 4757, 4825, 4617, 2221, 2317, 2438}

$$\int \frac{a+b\arcsin(cx)}{x^4(d+ex^2)}\,dx = \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{5/2}} - \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{5/2}} + \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{5/2}} - \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2(-d)^{5/2}} + \frac{e(a+b\arcsin(cx))}{d^2x} - \frac{a+b\arcsin(cx)}{3dx^3} + \frac{ibe^{3/2}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2(-d)^{5/2}} - \frac{ibe^{3/2}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2(-d)^{5/2}} + \frac{ibe^{3/2}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2(-d)^{5/2}} - \frac{ibe^{3/2}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2(-d)^{5/2}} + \frac{bce\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2} - \frac{bc^3\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d} - \frac{bc\sqrt{1-c^2x^2}}{6dx^2}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^4*(d + e*x^2)),x]
```

```
[Out] -1/6*(b*c*Sqrt[1 - c^2*x^2])/(d*x^2) - (a + b*ArcSin[c*x])/(3*d*x^3) + (e*(
a + b*ArcSin[c*x]))/(d^2*x) - (b*c^3*ArcTanh[Sqrt[1 - c^2*x^2]])/(6*d) + (b
*c*e*ArcTanh[Sqrt[1 - c^2*x^2]])/d^2 + (e^(3/2)*(a + b*ArcSin[c*x])*Log[1 -
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*(-d)^(5/
2)) - (e^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*(-d)^(5/2)) + (e^(3/2)*(a + b*ArcSin[c*x]
)*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2
*(-d)^(5/2)) - (e^(3/2)*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*
x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*(-d)^(5/2)) + ((I/2)*b*e^(3/2)*P
olyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])
/(-d)^(5/2) - ((I/2)*b*e^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*
Sqrt[-d] - Sqrt[c^2*d + e])])/(-d)^(5/2) + ((I/2)*b*e^(3/2)*PolyLog[2, -((S
qrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(-d)^(5/2) -
```

```
((I/2)*b*e^(3/2)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqr
t[c^2*d + e])])/(-d)^(5/2)
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{a+b\arcsin(cx)}{dx^4}-\frac{e(a+b\arcsin(cx))}{d^2x^2}+\frac{e^2(a+b\arcsin(cx))}{d^2\,(d+ex^2)}\right)dx\\
&= \frac{\int \frac{a+b\arcsin(cx)}{x^4}\,dx}{d}-\frac{e\int \frac{a+b\arcsin(cx)}{x^2}\,dx}{d^2}+\frac{e^2\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx}{d^2}\\
&= -\frac{a+b\arcsin(cx)}{3dx^3}+\frac{e(a+b\arcsin(cx))}{d^2x}+\frac{(bc)\int \frac{1}{x^3\sqrt{1-c^2x^2}}\,dx}{3d}\\
&\quad -\frac{(bce)\int \frac{1}{x\sqrt{1-c^2x^2}}\,dx}{d^2}+\frac{e^2\int \left(\frac{\sqrt{-d}(a+b\arcsin(cx))}{2d(\sqrt{-d}-\sqrt{e}x)}+\frac{\sqrt{-d}(a+b\arcsin(cx))}{2d(\sqrt{-d}+\sqrt{e}x)}\right)dx}{d^2}
\end{aligned}$$

$$=-\frac{a+b\arcsin(cx)}{3dx^3}+\frac{e(a+b\arcsin(cx))}{d^2x}+\frac{(bc)\text{Subst}\left(\int\frac{1}{x^2\sqrt{1-c^2x}}\,dx,x,x^2\right)}{6d}-\frac{(bce)\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2d^2}-\frac{e^2\int\frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2(-d)^{5/2}}-\frac{e^2\int\frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2(-d)^{5/2}}$$

$$=-\frac{bc\sqrt{1-c^2x^2}}{6dx^2}-\frac{a+b\arcsin(cx)}{3dx^3}+\frac{e(a+b\arcsin(cx))}{d^2x}+\frac{(bc^3)\,\text{Subst}\left(\int\frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{12d}+\frac{(be)\text{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{cd^2}-\frac{e^2\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2(-d)^{5/2}}-\frac{e^2\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2(-d)^{5/2}}$$

$$=-\frac{bc\sqrt{1-c^2x^2}}{6dx^2}-\frac{a+b\arcsin(cx)}{3dx^3}+\frac{e(a+b\arcsin(cx))}{d^2x}+\frac{bce\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2}-\frac{(bc)\text{Subst}\left(\int\frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx,x,\sqrt{1-c^2x^2}\right)}{6d}-\frac{(ie^2)\,\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2(-d)^{5/2}}-\frac{(ie^2)\,\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2(-d)^{5/2}}-\frac{(ie^2)\,\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2(-d)^{5/2}}-\frac{(ie^2)\,\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2(-d)^{5/2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\arcsin(cx)}{3dx^3} + \frac{e(a+b\arcsin(cx))}{d^2x} - \frac{bc^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d}$$

$$+ \frac{bce\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2} + \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$

$$- \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$

$$+ \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$

$$- \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$

$$- \frac{\left(be^{3/2}\right)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2(-d)^{5/2}}$$

$$+ \frac{\left(be^{3/2}\right)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2(-d)^{5/2}}$$

$$- \frac{\left(be^{3/2}\right)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2(-d)^{5/2}}$$

$$+ \frac{\left(be^{3/2}\right)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2(-d)^{5/2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\arcsin(cx)}{3dx^3} + \frac{e(a+b\arcsin(cx))}{d^2x} - \frac{bc^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d}$$
$$+ \frac{bce\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2} + \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$
$$- \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$
$$+ \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$
$$- \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$
$$+ \frac{\left(ibe^{3/2}\right)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2(-d)^{5/2}}$$
$$- \frac{\left(ibe^{3/2}\right)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2(-d)^{5/2}}$$
$$+ \frac{\left(ibe^{3/2}\right)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2(-d)^{5/2}}$$
$$- \frac{\left(ibe^{3/2}\right)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2(-d)^{5/2}}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{6dx^2} - \frac{a+b\arcsin(cx)}{3dx^3} + \frac{e(a+b\arcsin(cx))}{d^2x} - \frac{bc^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6d}$$
$$+ \frac{bce\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2} + \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$
$$- \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$
$$+ \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$
$$- \frac{e^{3/2}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$
$$+ \frac{ibe^{3/2}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}} - \frac{ibe^{3/2}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$
$$+ \frac{ibe^{3/2}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}} - \frac{ibe^{3/2}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$

Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 531, normalized size of antiderivative = 0.82

$$\int \frac{a+b\arcsin(cx)}{x^4(d+ex^2)}\,dx = -\frac{a}{3dx^3} + \frac{ae}{d^2x} + \frac{ae^{3/2}\arctan\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{5/2}}$$
$$+b\left(-\frac{e\left(-\frac{\arcsin(cx)}{x} - c\text{arctanh}\left(\sqrt{1-c^2x^2}\right)\right)}{d^2} - \frac{cx\sqrt{1-c^2x^2} + 2\arcsin(cx) + c^3x^3\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{6dx^3} - \frac{e}{\cdots}\right.$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^4*(d + e*x^2)),x]
```

```
[Out] -1/3*a/(d*x^3) + (a*e)/(d^2*x) + (a*e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/d^
(5/2) + b*(-((e*(-(ArcSin[c*x]/x) - c*ArcTanh[Sqrt[1 - c^2*x^2]]))/d^2) - (
c*x*Sqrt[1 - c^2*x^2] + 2*ArcSin[c*x] + c^3*x^3*ArcTanh[Sqrt[1 - c^2*x^2]])
/(6*d*x^3) - (e^(3/2)*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E
^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*A
rcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^
(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]))/(4*d^(5/2)) + (e^(3/2)*(
ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*
Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[
d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt
[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[
d] + Sqrt[c^2*d + e])]))/(4*d^(5/2)))
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 6.28 (sec) , antiderivative size = 491, normalized size of antiderivative = 0.76

method	result
parts	$a\left(-\frac{1}{3d\,x^{3}}+\frac{e}{d^{2}x}+\frac{e^{2}\arctan\left(\frac{ex}{\sqrt{de}}\right)}{d^{2}\sqrt{de}}\right)-\frac{b\left(-4\ln\left(icx+\sqrt{-c^{2}x^{2}+1}-1\right)c^{7}d^{2}x^{3}+4\ln\left(1+icx+\sqrt{-c^{2}x^{2}+1}\right)c^{7}d^{2}\right.}{}$
derivativedivides	$c^{3}\left(-\frac{a}{3d\,c^{3}x^{3}}+\frac{ae}{c^{3}d^{2}x}+\frac{a\,e^{2}\arctan\left(\frac{ex}{\sqrt{de}}\right)}{c^{3}d^{2}\sqrt{de}}+\frac{b\left(4\ln\left(icx+\sqrt{-c^{2}x^{2}+1}-1\right)c^{7}d^{2}x^{3}-4\ln\left(1+icx+\sqrt{-c^{2}x^{2}+1}\right)c^{7}\right.}{}\right.$
default	$c^{3}\left(-\frac{a}{3d\,c^{3}x^{3}}+\frac{ae}{c^{3}d^{2}x}+\frac{a\,e^{2}\arctan\left(\frac{ex}{\sqrt{de}}\right)}{c^{3}d^{2}\sqrt{de}}+\frac{b\left(4\ln\left(icx+\sqrt{-c^{2}x^{2}+1}-1\right)c^{7}d^{2}x^{3}-4\ln\left(1+icx+\sqrt{-c^{2}x^{2}+1}\right)c^{7}\right.}{}\right.$

```
[In] int((a+b*arcsin(c*x))/x^4/(e*x^2+d),x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/3/d/x^3+e/d^2/x+e^2/d^2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2)))-1/24*b/c
^4*(-4*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)*c^7*d^2*x^3+4*ln(1+I*c*x+(-c^2*x^2+1)
^(1/2))*c^7*d^2*x^3+4*(-c^2*x^2+1)^(1/2)*c^5*d^2*x+24*ln(I*c*x+(-c^2*x^2+1)
^(1/2)-1)*c^5*d*e*x^3-24*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))*c^5*d*e*x^3-24*arcs
in(c*x)*c^4*d*e*x^2+8*c^4*d^2*arcsin(c*x)+3*sum((_R1^2*e-4*c^2*d-e)/_R1/(_R
1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilo
g((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^
2+e))*c^3*x^3*e^2-3*sum((4*_R1^2*c^2*d+_R1^2*e-e)/_R1/(_R1^2*e-2*c^2*d-e)*(
I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2
*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))*c^3*x^3*e^2)
/x^3/d^3
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d+ex^2\right)}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{(ex^2+d)x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(e*x^2+d),x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)/(e*x^6 + d*x^4), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d+ex^2\right)}\,dx=\int \frac{a+b\,\mathrm{asin}\left(cx\right)}{x^4\left(d+ex^2\right)}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x**4/(e*x**2+d),x)
[Out] Integral((a + b*asin(c*x))/(x**4*(d + e*x**2)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d+ex^2\right)}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(e*x^2+d),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d+ex^2\right)}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{(ex^2+d)x^4}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^4/(e*x^2+d),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/((e*x^2 + d)*x^4), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^4\left(d+ex^2\right)}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^4\,\left(e\,x^2+d\right)}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^4*(d + e*x^2)),x)
[Out] int((a + b*asin(c*x))/(x^4*(d + e*x^2)), x)
```

3.633 $\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 574

$$\begin{aligned}\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx &= \frac{d(a+b\arcsin(cx))}{2e^2(d+ex^2)}-\frac{i(a+b\arcsin(cx))^2}{2be^2}\\
&-\frac{bc\sqrt{d}\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}}\\
&+\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2}\\
&+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2}\\
&+\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2}\\
&+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2}\\
&-\frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2}\\
&-\frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2}\\
&-\frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2}\\
&-\frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2}\end{aligned}$$

```
[Out] 1/2*d*(a+b*arcsin(c*x))/e^2/(e*x^2+d)-1/2*I*(a+b*arcsin(c*x))^2/b/e^2+1/2*(
a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c
^2*d+e)^(1/2)))/e^2+1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e
^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^2+1/2*(a+b*arcsin(c*x))*ln(1-(I*
c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^2+1/2*(
a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c
^2*d+e)^(1/2)))/e^2-1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(
I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^2-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^
(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^2-1/2*I*b*polylog(2,-(I*
c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^2-1/2*I
*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(
1/2)))/e^2-1/2*b*c*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))*d^(
1/2)/e^2/(c^2*d+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.69 (sec) , antiderivative size = 574, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.429$, Rules used = {4817, 4813, 385, 211, 4825, 4617, 2221, 2317, 2438}

$$\begin{aligned}\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = &\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}\\&+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}\\&+\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}\\&+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^2}\\&+\frac{d(a+b\arcsin(cx))}{2e^2(d+ex^2)}-\frac{i(a+b\arcsin(cx))^2}{2be^2}\\&-\frac{ib\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^2}\\&-\frac{ib\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^2}\\&-\frac{ib\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e^2}\\&-\frac{ib\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e^2}-\frac{bc\sqrt{d}\arctan\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}}\end{aligned}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (d*(a + b*ArcSin[c*x]))/(2*e^2*(d + e*x^2)) - ((I/2)*(a + b*ArcSin[c*x])^2)
/(b*e^2) - (b*c*Sqrt[d]*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^
2])])/(2*e^2*Sqrt[c^2*d + e]) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*
ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^2) + ((a + b*ArcSin[c
*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])
/(2*e^2) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] + Sqrt[c^2*d + e])])/(2*e^2) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]
*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^2) - ((I/2)*b*P
olyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])
/e^2 - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt
[c^2*d + e])])/e^2 - ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] + Sqrt[c^2*d + e]))])/e^2 - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*Arc
Sin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/e^2
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
```

```
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \left(-\frac{dx(a+b\arcsin(cx))}{e\,(d+ex^2)^2}+\frac{x(a+b\arcsin(cx))}{e\,(d+ex^2)}\right)dx$$

$$=\frac{\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx}{e}-\frac{d\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx}{e}$$

$$=\frac{d(a+b\arcsin(cx))}{2e^2\,(d+ex^2)}-\frac{(bcd)\int \frac{1}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{2e^2}+\frac{\int \left(-\frac{a+b\arcsin(cx)}{2\sqrt{e}(\sqrt{-d}-\sqrt{e}x)}+\frac{a+b\arcsin(cx)}{2\sqrt{e}(\sqrt{-d}+\sqrt{e}x)}\right)dx}{e}$$

$$=\frac{d(a+b\arcsin(cx))}{2e^2\,(d+ex^2)}-\frac{(bcd)\text{Subst}\left(\int \frac{1}{d-(-c^2d-e)x^2}\,dx,x,\frac{x}{\sqrt{1-c^2x^2}}\right)}{2e^2}-\frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2e^{3/2}}+\frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2e^{3/2}}$$

$$= \frac{d(a+b\arcsin(cx))}{2e^2(d+ex^2)} - \frac{bc\sqrt{d}\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}} - \frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}dx, x, \arcsin(cx)\right)}{2e^{3/2}} + \frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}dx, x, \arcsin(cx)\right)}{2e^{3/2}}$$

$$= \frac{d(a+b\arcsin(cx))}{2e^2(d+ex^2)} - \frac{i(a+b\arcsin(cx))^2}{2be^2} - \frac{bc\sqrt{d}\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}} - \frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}dx, x, \arcsin(cx)\right)}{2e^{3/2}} - \frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}dx, x, \arcsin(cx)\right)}{2e^{3/2}} + \frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}dx, x, \arcsin(cx)\right)}{2e^{3/2}} + \frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}dx, x, \arcsin(cx)\right)}{2e^{3/2}}$$

$$= \frac{d(a+b\arcsin(cx))}{2e^2(d+ex^2)} - \frac{i(a+b\arcsin(cx))^2}{2be^2} - \frac{bc\sqrt{d}\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2} - \frac{b\text{Subst}\left(\int \log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^2} - \frac{b\text{Subst}\left(\int \log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^2} - \frac{b\text{Subst}\left(\int \log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^2} - \frac{b\text{Subst}\left(\int \log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^2}$$

$$
\begin{aligned}
&= \frac{d(a+b\arcsin(cx))}{2e^2(d+ex^2)} - \frac{i(a+b\arcsin(cx))^2}{2be^2} - \frac{bc\sqrt{d}\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}} \\
&+ \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2} \\
&+ \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2} \\
&+ \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2} \\
&+ \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2} \\
&+ \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^2} \\
&+ \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^2} \\
&+ \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^2} \\
&+ \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^2}
\end{aligned}
$$

$$= \frac{d(a+b\arcsin(cx))}{2e^2(d+ex^2)} - \frac{i(a+b\arcsin(cx))^2}{2be^2} - \frac{bc\sqrt{d}\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2e^2\sqrt{c^2d+e}}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2}$$
$$- \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^2}$$
$$- \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^2}$$

Mathematica [A] (verified)

Time = 0.87 (sec) , antiderivative size = 593, normalized size of antiderivative = 1.03

$$\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx$$
$$= \frac{\frac{2ad}{d+ex^2} + 2a\log(d+ex^2) + b\left(\sqrt{d}\left(\frac{\arcsin(cx)}{\sqrt{d}+i\sqrt{e}x} - \frac{c\arctan\left(\frac{i\sqrt{e}+c^2\sqrt{d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right) - i\sqrt{d}\left(-\frac{\arcsin(cx)}{i\sqrt{d}+\sqrt{e}x} - \frac{c\,\text{arctanh}\left(\frac{\sqrt{e}+i}{\sqrt{c^2d+e}}\right.}{\sqrt{c^2d+e}}\right.\right.}{}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] ((2*a*d)/(d + e*x^2) + 2*a*Log[d + e*x^2] + b*(Sqrt[d]*(ArcSin[c*x]/(Sqrt[d
] + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*S
qrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - I*Sqrt[d]*(-(ArcSin[c*x]/(I*Sqrt[d]
+ Sqrt[e]*x)) - (c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqr
t[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - I*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(L
og[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 +
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2
, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2*PolyLog
[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]) - I*(Arc
Sin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqr
t[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
+ Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
 - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
+ Sqrt[c^2*d + e])])))/(4*e^2)
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 1.85 (sec) , antiderivative size = 2101, normalized size of antiderivative = 3.66

method	result	size
derivativedivides	Expression too large to display	2101
default	Expression too large to display	2101
parts	Expression too large to display	2113

```
[In] int(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^4*(1/2*a*c^6/e^2*d/(c^2*e*x^2+c^2*d)+1/2*a*c^4/e^2*ln(c^2*e*x^2+c^2*d)+
b*c^4*(-I*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*arcsin(c*x)^2*d*c^2/e^4-1/2
*I/e^2*sum((-_R1^2*e+4*c^2*d+2*e)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_
R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)
),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-1/4*I*(d*c^2*(c^2*d+e))^(1/2)/c
^2/d/e/(c^2*d+e)*arcsin(c*x)^2-1/8*I*(d*c^2*(c^2*d+e))^(1/2)/c^2/d/e/(c^2*d
+e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(
1/2)+e))+1/8*I*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*
(c^2*d+e))^(1/2)*e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*
c^2*(c^2*d+e))^(1/2)+e))/e^2/d/c^2/(c^2*d+e)+1/4*I*(2*d^2*c^4+2*(d*c^2*(c^2
*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)*arcsin(c*x)^2/e^2/d
/c^2/(c^2*d+e)+I*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^
2*(c^2*d+e))^(1/2)*e)*d*c^2*arcsin(c*x)^2/e^4/(c^2*d+e)-(2*d^2*c^4+2*(d*c^2
*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)*d*c^2*ln(1-e*(
I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c
*x)/e^4/(c^2*d+e)+1/2*I*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*
d+(d*c^2*(c^2*d+e))^(1/2)*e)*d*c^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2
/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^4/(c^2*d+e)-1/4*(2*d^2*c^4+2*(d*c
^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)*ln(1-e*(I*c*
x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/
e^2/d/c^2/(c^2*d+e)+1/4*(d*c^2*(c^2*d+e))^(1/2)/c^2/d/e/(c^2*d+e)*arcsin(c*
x)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e
))+I*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))
^(1/2)*e)*arcsin(c*x)^2/e^3/(c^2*d+e)+1/2*(d*c^2*(c^2*d+e))^(1/2)/e^2/(c^2*
d+e)*arcsin(c*x)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2
*d+e))^(1/2)+e))-(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^
2*(c^2*d+e))^(1/2)*e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2
*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^3/(c^2*d+e)-1/2*I*(d*c^2*(c^2*d+e))^(1/
2)/e^2/(c^2*d+e)*arcsin(c*x)^2+1/2*arcsin(c*x)/e^2*d*c^2/(c^2*e*x^2+c^2*d)+
1/2*I*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e)
)^(1/2)*e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*
d+e))^(1/2)+e))/e^3/(c^2*d+e)-1/2*I*(d*c^2*(c^2*d+e))^(1/2)/e^2/(c^2*d+e)*a
rctanh(1/4*(4*c^2*d-2*e*(I*c*x+(-c^2*x^2+1)^(1/2))^2+2*e)/(c^4*d^2+c^2*d*e)
```

```
^(1/2))-1/4*I*(d*c^2*(c^2*d+e))^(1/2)/e^2/(c^2*d+e)*polylog(2,e*(I*c*x+(-c^
2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))-1/2*I*(2*c^2*d+2*(
d*c^2*(c^2*d+e))^(1/2)+e)*arcsin(c*x)^2/e^3+1/2*(2*c^2*d+2*(d*c^2*(c^2*d+e)
)^(1/2)+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))
^(1/2)+e))*arcsin(c*x)/e^3-1/4*I*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*poly
log(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))
/e^3-1/2*I*arcsin(c*x)^2/e^2-1/2*I*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*po
lylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e
))*d*c^2/e^4+(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*ln(1-e*(I*c*x+(-c^2*x^2+
1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*c^2*d*arcsin(c*x)/e^4))
```

Fricas [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^3}{(ex^2+d)^2}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b*x^3*arcsin(c*x) + a*x^3)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{x^3(a+b\operatorname{asin}(cx))}{(d+ex^2)^2}\,dx$$

```
[In] integrate(x**3*(a+b*asin(c*x))/(e*x**2+d)**2,x)
[Out] Integral(x**3*(a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Maxima [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^3}{(ex^2+d)^2}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
[Out] 1/2*a*(d/(e^3*x^2 + d*e^2) + log(e*x^2 + d)/e^2) + b*integrate(x^3*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Giac [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^3}{(ex^2+d)^2}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^3/(e*x^2 + d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{x^3\,(a+b\,\mathrm{asin}(c\,x))}{(e\,x^2+d)^2}\,dx$$

```
[In] int((x^3*(a + b*asin(c*x)))/(d + e*x^2)^2,x)
[Out] int((x^3*(a + b*asin(c*x)))/(d + e*x^2)^2, x)
```

3.634 $\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx$

Optimal result

Integrand size = 19, antiderivative size = 86

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \frac{-a-b\arcsin(cx)}{2e(d+ex^2)} + \frac{bc\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2\sqrt{d}e\sqrt{c^2d+e}}$$

```
[Out] 1/2*(-a-b*arcsin(c*x))/e/(e*x^2+d)+1/2*b*c*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)
/(-c^2*x^2+1)^(1/2))/e/d^(1/2)/(c^2*d+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.97, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {4813, 385, 211}

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \frac{bc\arctan\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2\sqrt{d}e\sqrt{c^2d+e}} - \frac{a+b\arcsin(cx)}{2e(d+ex^2)}$$

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] -1/2*(a + b*ArcSin[c*x])/(e*(d + e*x^2)) + (b*c*ArcTan[(Sqrt[c^2*d + e]*x)/
(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(2*Sqrt[d]*e*Sqrt[c^2*d + e])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= -\frac{a+b\arcsin(cx)}{2e\,(d+ex^2)}+\frac{(bc)\int\frac{1}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{2e}\\ &= -\frac{a+b\arcsin(cx)}{2e\,(d+ex^2)}+\frac{(bc)\text{Subst}\left(\int\frac{1}{d-(-c^2d-e)x^2}\,dx,x,\frac{x}{\sqrt{1-c^2x^2}}\right)}{2e}\\ &= -\frac{a+b\arcsin(cx)}{2e\,(d+ex^2)}+\frac{bc\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2\sqrt{d}e\sqrt{c^2d+e}}\end{aligned}$$

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.01

$$\int\frac{x(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx=-\frac{\frac{a}{d+ex^2}+\frac{b\arcsin(cx)}{d+ex^2}-\frac{bc\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{\sqrt{d}\sqrt{c^2d+e}}}{2e}$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
[Out] -1/2*(a/(d + e*x^2) + (b*ArcSin[c*x])/(d + e*x^2) - (b*c*ArcTan[(Sqrt[c^2*d
 + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(Sqrt[d]*Sqrt[c^2*d + e]))/e
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 403 vs. 2(72) = 144.

Time = 3.10 (sec) , antiderivative size = 404, normalized size of antiderivative = 4.70

method	result
parts	$-\frac{a}{2e(e\,x^2+d)}-\frac{b\,c^2\arcsin(cx)}{2e(c^2e\,x^2+c^2d)}-\frac{b\,c^2\ln\left(\frac{\frac{2c^2d+2e}{e}-\frac{2\sqrt{-c^2ed}\left(cx-\frac{\sqrt{-c^2ed}}{e}\right)}{e}+2\sqrt{\frac{c^2d+e}{e}}\sqrt{-\left(cx-\frac{\sqrt{-c^2ed}}{e}\right)^2-\frac{2\sqrt{-c^2e\cdots}}{\cdots}}}{cx-\frac{\sqrt{-c^2ed}}{e}}\right)}{4e\sqrt{-c^2ed}\,\sqrt{\frac{c^2d+e}{e}}}\cdots$
derivativedivides	$\frac{-\frac{a\,c^4}{2e\left(c^2e\,x^2+c^2d\right)}+b\,c^4\left(-\frac{\arcsin(cx)}{2e\left(c^2e\,x^2+c^2d\right)}+\frac{\ln\left(\frac{\frac{2c^2d+2e}{e}+\frac{2\sqrt{-c^2ed}\left(cx+\frac{\sqrt{-c^2ed}}{e}\right)}{e}+2\sqrt{\frac{c^2d+e}{e}}\sqrt{-\left(cx+\frac{\sqrt{-c^2ed}}{e}\right)^2+\frac{2\sqrt{-c^2\cdots}}{\cdots}}}{cx+\frac{\sqrt{-c^2ed}}{e}}\right)}{2\sqrt{-c^2ed}\,\sqrt{\frac{c^2d+e}{e}}}\cdots\right.}{\cdots}$
default	$\frac{-\frac{a\,c^4}{2e\left(c^2e\,x^2+c^2d\right)}+b\,c^4\left(-\frac{\arcsin(cx)}{2e\left(c^2e\,x^2+c^2d\right)}+\frac{\ln\left(\frac{\frac{2c^2d+2e}{e}+\frac{2\sqrt{-c^2ed}\left(cx+\frac{\sqrt{-c^2ed}}{e}\right)}{e}+2\sqrt{\frac{c^2d+e}{e}}\sqrt{-\left(cx+\frac{\sqrt{-c^2ed}}{e}\right)^2+\frac{2\sqrt{-c^2\cdots}}{\cdots}}}{cx+\frac{\sqrt{-c^2ed}}{e}}\right)}{2\sqrt{-c^2ed}\,\sqrt{\frac{c^2d+e}{e}}}\cdots\right.}{\cdots}$

```
[In] int(x*(a+b*arcsin(c*x))/(e*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/e/(e*x^2+d)-1/2*b*c^2/e/(c^2*e*x^2+c^2*d)*arcsin(c*x)-1/4*b*c^2/e/(-
c^2*e*d)^(1/2)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e-2*(-c^2*e*d)^(1/2)/e*(
c*x-(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x-(-c^2*e*d)^(1/2)/e)^2-
2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x-(-c^
2*e*d)^(1/2)/e))+1/4*b*c^2/e/(-c^2*e*d)^(1/2)/((c^2*d+e)/e)^(1/2)*ln((2*(c^
2*d+e)/e+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2
)*(-(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e
)+(c^2*d+e)/e)^(1/2))/(c*x+(-c^2*e*d)^(1/2)/e))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 179 vs. 2(69) = 138.

Time = 0.29 (sec) , antiderivative size = 395, normalized size of antiderivative = 4.59

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx$$
$$= \left[-\frac{4\,ac^2d^2+4\,ade+(bcex^2+bcd)\sqrt{-c^2d^2-de}\log\left(\frac{(8\,c^4d^2+8\,c^2de+e^2)x^4-2\,(4\,c^2d^2+3\,de)x^2-4\,\sqrt{-c^2d^2-de}\sqrt{-c^2x^2+1}(}{e^2x^4+2\,dex^2+d^2}\right.}{8\,(c^2d^3e+d^2e^2+(c^2d^2e^2+de^3)x^2)}\right.$$
$$-\frac{2\,ac^2d^2+2\,ade+(bcex^2+bcd)\sqrt{c^2d^2+de}\arctan\left(\frac{\sqrt{c^2d^2+de}\sqrt{-c^2x^2+1}((2\,c^2d+e)x^2-d)}{2\,((c^4d^2+c^2de)x^3-(c^2d^2+de)x)}\right)+2\,(bc^2d^2+bde)\,\mathrm{ar}}{4\,(c^2d^3e+d^2e^2+(c^2d^2e^2+de^3)x^2)}$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] [-1/8*(4*a*c^2*d^2 + 4*a*d*e + (b*c*e*x^2 + b*c*d)*sqrt(-c^2*d^2 - d*e)*log
(((8*c^4*d^2 + 8*c^2*d*e + e^2)*x^4 - 2*(4*c^2*d^2 + 3*d*e)*x^2 - 4*sqrt(-c
^2*d^2 - d*e)*sqrt(-c^2*x^2 + 1)*((2*c^2*d + e)*x^3 - d*x) + d^2)/(e^2*x^4
+ 2*d*e*x^2 + d^2)) + 4*(b*c^2*d^2 + b*d*e)*arcsin(c*x))/(c^2*d^3*e + d^2*e
^2 + (c^2*d^2*e^2 + d*e^3)*x^2), -1/4*(2*a*c^2*d^2 + 2*a*d*e + (b*c*e*x^2 +
 b*c*d)*sqrt(c^2*d^2 + d*e)*arctan(1/2*sqrt(c^2*d^2 + d*e)*sqrt(-c^2*x^2 +
1)*((2*c^2*d + e)*x^2 - d)/((c^4*d^2 + c^2*d*e)*x^3 - (c^2*d^2 + d*e)*x)) +
 2*(b*c^2*d^2 + b*d*e)*arcsin(c*x))/(c^2*d^3*e + d^2*e^2 + (c^2*d^2*e^2 + d
*e^3)*x^2)]
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{x(a+b\,\mathrm{asin}\,(cx))}{(d+ex^2)^2}\,dx$$

```
[In] integrate(x*(a+b*asin(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Integral(x*(a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x}{(ex^2+d)^2}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x/(e*x^2 + d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{x\,(a+b\,\mathrm{asin}(c\,x))}{(e\,x^2+d)^2}\,dx$$

```
[In] int((x*(a + b*asin(c*x)))/(d + e*x^2)^2,x)
```

```
[Out] int((x*(a + b*asin(c*x)))/(d + e*x^2)^2, x)
```

3.635 $\int \frac{a+b\arcsin(cx)}{x(d+ex^2)^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 597

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x(d+ex^2)^2}\,dx &= \frac{a+b\arcsin(cx)}{2d(d+ex^2)} - \frac{bc\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}} \\ &\quad - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2} \\ &\quad - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2} \\ &\quad - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2} \\ &\quad - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2} \\ &\quad + \frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^2} \\ &\quad + \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2} \\ &\quad + \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2} + \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2} \\ &\quad + \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2} - \frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^2}\end{aligned}$$

```
[Out] 1/2*(a+b*arcsin(c*x))/d/(e*x^2+d)+(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1
)^(1/2))^2)/d^2-1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/
2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+
```

```
(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2-1/2*(a+b*
arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d
+e)^(1/2)))/d^2-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/
2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^2-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2
+1)^(1/2))^2)/d^2+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*
c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2+1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1
/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^2+1/2*I*b*polylog(2,-(I*c*
x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^2+1/2*I*b
*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/
2)))/d^2-1/2*b*c*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))/d^(3/
2)/(c^2*d+e)^(1/2)
```

Rubi [A] (verified)

Time = 0.70 (sec) , antiderivative size = 597, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.524, Rules used = {4817, 4721, 3798, 2221, 2317, 2438, 4813, 385, 211, 4825, 4617}

$$\int \frac{a+b\arcsin(cx)}{x\left(d+ex^2\right)^2}\,dx = -\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2} -\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2} -\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2} -\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^2} +\frac{\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^2}+\frac{a+b\arcsin(cx)}{2d\left(d+ex^2\right)} +\frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d^2}+\frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d^2} +\frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2d^2}+\frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2d^2} -\frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^2}-\frac{bc\arctan\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^2),x]
```

```
[Out] (a + b*ArcSin[c*x])/(2*d*(d + e*x^2)) - (b*c*ArcTan[(Sqrt[c^2*d + e]*x)/(Sq
rt[d]*Sqrt[1 - c^2*x^2])])/(2*d^(3/2)*Sqrt[c^2*d + e]) - ((a + b*ArcSin[c*x
])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(
```

```
2*d^2) - ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] - Sqrt[c^2*d + e])])/(2*d^2) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E
^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^2) - ((a + b*ArcS
in[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e
])])/(2*d^2) + ((a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/d^2 + (
(I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d
 + e]))])/d^2 + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-
d] - Sqrt[c^2*d + e])])/d^2 + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*
x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d^2 + ((I/2)*b*PolyLog[2, (Sqrt[e]
*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^2 - ((I/2)*b*PolyL
og[2, E^((2*I)*ArcSin[c*x])])/d^2
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
```

```
x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a+b\arcsin(cx)}{d^2x} - \frac{ex(a+b\arcsin(cx))}{d\left(d+ex^2\right)^2} - \frac{ex(a+b\arcsin(cx))}{d^2\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{a+b\arcsin(cx)}{x}\,dx}{d^2} - \frac{e\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx}{d^2} - \frac{e\int \frac{x(a+b\arcsin(cx))}{\left(d+ex^2\right)^2}\,dx}{d}$$

$$=\frac{a+b\arcsin(cx)}{2d(d+ex^2)}+\frac{\operatorname{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)}{d^2}-\frac{(bc)\int\frac{1}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{2d}-\frac{e\int\left(-\frac{a+b\arcsin(cx)}{2\sqrt{e}(\sqrt{-d}-\sqrt{e}x)}+\frac{a+b\arcsin(cx)}{2\sqrt{e}(\sqrt{-d}+\sqrt{e}x)}\right)dx}{d^2}$$

$$=\frac{a+b\arcsin(cx)}{2d(d+ex^2)}-\frac{i(a+b\arcsin(cx))^2}{2bd^2}-\frac{(2i)\operatorname{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right)}{d^2}-\frac{(bc)\operatorname{Subst}\left(\int\frac{1}{d-(-c^2d-e)x^2}\,dx,x,\frac{x}{\sqrt{1-c^2x^2}}\right)}{2d}+\frac{\sqrt{e}\int\frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2d^2}-\frac{\sqrt{e}\int\frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2d^2}$$

$$=\frac{a+b\arcsin(cx)}{2d(d+ex^2)}-\frac{i(a+b\arcsin(cx))^2}{2bd^2}-\frac{bc\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}}+\frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^2}-\frac{b\operatorname{Subst}\left(\int\log\left(1-e^{2ix}\right)dx,x,\arcsin(cx)\right)}{d^2}+\frac{\sqrt{e}\operatorname{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2d^2}-\frac{\sqrt{e}\operatorname{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2d^2}$$

$$=\frac{a+b\arcsin(cx)}{2d(d+ex^2)}-\frac{bc\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}}+\frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^2}+\frac{(ib)\operatorname{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{2d^2}+\frac{\left(i\sqrt{e}\right)\operatorname{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2d^2}+\frac{\left(i\sqrt{e}\right)\operatorname{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2d^2}-\frac{\left(i\sqrt{e}\right)\operatorname{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2d^2}-\frac{\left(i\sqrt{e}\right)\operatorname{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2d^2}$$

$$=\frac{a+b\arcsin(cx)}{2d\left(d+ex^2\right)}-\frac{bc\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}}$$
$$-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}$$
$$-\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}$$
$$-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}$$
$$-\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}$$
$$+\frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^2}-\frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^2}$$
$$+\frac{b\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2d^2}$$
$$+\frac{b\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2d^2}$$
$$+\frac{b\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2d^2}$$
$$+\frac{b\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2d^2}$$

$$
\begin{aligned}
&= \frac{a+b\arcsin(cx)}{2d\left(d+ex^2\right)} - \frac{bc\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}} \\
&\quad - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2} \\
&\quad - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2} \\
&\quad - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2} \\
&\quad - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2} \\
&\quad + \frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^2} - \frac{ib\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^2} \\
&\quad - \frac{(ib)\mathrm{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2d^2} \\
&\quad - \frac{(ib)\mathrm{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2d^2} \\
&\quad - \frac{(ib)\mathrm{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2d^2} \\
&\quad - \frac{(ib)\mathrm{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2d^2}
\end{aligned}
$$

$$= \frac{a+b\arcsin(cx)}{2d(d+ex^2)} - \frac{bc\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{3/2}\sqrt{c^2d+e}}$$
$$- \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}$$
$$- \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}$$
$$- \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}$$
$$- \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^2} + \frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2}$$
$$+ \frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^2} + \frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2}$$
$$+ \frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^2} - \frac{ib\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^2}$$

Mathematica [A] (verified)

Time = 0.85 (sec) , antiderivative size = 640, normalized size of antiderivative = 1.07

$$\int \frac{a+b\arcsin(cx)}{x(d+ex^2)^2}\,dx = \frac{a}{2d^2+2dex^2} + \frac{a\log(x)}{d^2} - \frac{a\log(d+ex^2)}{2d^2}$$
$$+ \frac{b\left(\frac{\sqrt{d}\arcsin(cx)}{\sqrt{d}-i\sqrt{e}x} + \frac{\sqrt{d}\arcsin(cx)}{\sqrt{d}+i\sqrt{e}x} - \frac{c\sqrt{d}\arctan\left(\frac{i\sqrt{e}+c^2\sqrt{d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}} + \frac{ic\sqrt{d}\,\mathrm{arctanh}\left(\frac{\sqrt{e}+ic^2\sqrt{d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}} - 2\arcsin(cx)\log\left(1\right.\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^2),x]
```

```
[Out] a/(2*d^2 + 2*d*e*x^2) + (a*Log[x])/d^2 - (a*Log[d + e*x^2])/(2*d^2) + (b*((
Sqrt[d]*ArcSin[c*x])/(Sqrt[d] - I*Sqrt[e]*x) + (Sqrt[d]*ArcSin[c*x])/(Sqrt[
d] + I*Sqrt[e]*x) - (c*Sqrt[d]*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2
*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e] + (I*c*Sqrt[d]*ArcTanh[(Sqrt[e
] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]
- 2*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d
 + e])] - 2*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) +
 Sqrt[c^2*d + e])] - 2*ArcSin[c*x]*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*S
qrt[d] + Sqrt[c^2*d + e])] - 2*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x
]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] + 4*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[
```

```
c*x])] + (2*I)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2
*d + e])] + (2*I)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sq
rt[c^2*d + e])] + (2*I)*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
 + Sqrt[c^2*d + e]))] + (2*I)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqr
t[d] + Sqrt[c^2*d + e])] - (2*I)*PolyLog[2, E^((2*I)*ArcSin[c*x])]))/(4*d^2
)
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 1.55 (sec) , antiderivative size = 468, normalized size of antiderivative = 0.78

method	result
parts	$\frac{a\ln(x)}{d^2}-\frac{a\ln(e\,x^2+d)}{2d^2}+\frac{a}{2d(e\,x^2+d)}+b\left(\frac{c^2\arcsin(cx)}{2d(c^2e\,x^2+c^2d)}+\frac{i\,\mathrm{dilog}\left(icx+\sqrt{-c^2x^2+1}\right)}{d^2}+\frac{i\sqrt{d\,c^2(c^2d+e)}\,\mathrm{arct}}{}\right.$
derivativedivides	$\frac{a\ln(cx)}{d^2}+\frac{a\,c^2}{2d(c^2e\,x^2+c^2d)}-\frac{a\ln(c^2e\,x^2+c^2d)}{2d^2}+\frac{b\,c^2\arcsin(cx)}{2d(c^2e\,x^2+c^2d)}+\frac{ib\,\mathrm{dilog}\left(icx+\sqrt{-c^2x^2+1}\right)}{d^2}-\frac{ib\,\mathrm{dilog}\left(1+ic\right.}{}$
default	$\frac{a\ln(cx)}{d^2}+\frac{a\,c^2}{2d(c^2e\,x^2+c^2d)}-\frac{a\ln(c^2e\,x^2+c^2d)}{2d^2}+\frac{b\,c^2\arcsin(cx)}{2d(c^2e\,x^2+c^2d)}+\frac{ib\,\mathrm{dilog}\left(icx+\sqrt{-c^2x^2+1}\right)}{d^2}-\frac{ib\,\mathrm{dilog}\left(1+ic\right.}{}$

```
[In] int((a+b*arcsin(c*x))/x/(e*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] a/d^2*ln(x)-1/2*a/d^2*ln(e*x^2+d)+1/2*a/d/(e*x^2+d)+b*(1/2*c^2*arcsin(c*x)/
d/(c^2*e*x^2+c^2*d)+I/d^2*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+1/2*I*(d*c^2*(c^2
*d+e))^(1/2)/d^2/(c^2*d+e)*arctanh(1/4*(2*e*(I*c*x+(-c^2*x^2+1)^(1/2))^2-4*
c^2*d-2*e)/(c^4*d^2+c^2*d*e)^(1/2))+1/4*I/d^2*sum((_R1^2*e-4*c^2*d-e)/(_R1^
2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog(
(_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+
e))+1/4*I/d^2*e*sum((_R1^2-1)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*
c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1
=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-I/d^2*dilog(1+I*c*x+(-c^2*x^2+1)^(1/
2))+1/d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x(d+ex^2)^2}\,dx=\int \frac{b\arcsin(cx)+a}{(ex^2+d)^2x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)/(e^2*x^5 + 2*d*e*x^3 + d^2*x), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x(d+ex^2)^2}\,dx=\int \frac{a+b\,\mathrm{asin}\,(cx)}{x(d+ex^2)^2}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x/(e*x**2+d)**2,x)
[Out] Integral((a + b*asin(c*x))/(x*(d + e*x**2)**2), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x(d+ex^2)^2}\,dx=\int \frac{b\arcsin(cx)+a}{(ex^2+d)^2x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^2,x, algorithm="maxima")
[Out] 1/2*a*(1/(d*e*x^2 + d^2) - log(e*x^2 + d)/d^2 + 2*log(x)/d^2) + b*integrate
(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e^2*x^5 + 2*d*e*x^3 + d^2*x),
x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x(d+ex^2)^2}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^2,x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a + b\arcsin(cx)}{x\left(d + ex^2\right)^2}\,dx = \int \frac{a + b\,\mathrm{asin}(c\,x)}{x\left(e\,x^2 + d\right)^2}\,dx$$

```
[In] int((a + b*asin(c*x))/(x*(d + e*x^2)^2),x)
[Out] int((a + b*asin(c*x))/(x*(d + e*x^2)^2), x)
```

3.636 $\int \frac{a+b\arcsin(cx)}{x^3(d+ex^2)^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 632

$$\begin{aligned}
\int \frac{a+b\arcsin(cx)}{x^3(d+ex^2)^2}\,dx &= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\arcsin(cx)}{2d^2x^2} \\
&\quad - \frac{e(a+b\arcsin(cx))}{2d^2(d+ex^2)} + \frac{bce\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} \\
&\quad + \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{d^3} \\
&\quad + \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{d^3} \\
&\quad + \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{d^3} \\
&\quad + \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{d^3} \\
&\quad - \frac{2e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^3} \\
&\quad - \frac{ibe\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{d^3} \\
&\quad - \frac{ibe\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{d^3} - \frac{ibe\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{d^3} \\
&\quad - \frac{ibe\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{d^3} + \frac{ibe\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^3}
\end{aligned}$$

```
[Out] 1/2*(-a-b*arcsin(c*x))/d^2/x^2-1/2*e*(a+b*arcsin(c*x))/d^2/(e*x^2+d)-2*e*(a
+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3+e*(a+b*arcsin(c*x))*
ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d
^3+e*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1
/2)-(c^2*d+e)^(1/2)))/d^3+e*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2
))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^3+e*(a+b*arcsin(c*x))*ln(1+(
I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^3+I*b
*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3-I*b*e*polylog(2,-(I*c*x+(-c^
2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^3-I*b*e*polylog
(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^3
-I*b*e*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d
+e)^(1/2)))/d^3-I*b*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d
)^(1/2)+(c^2*d+e)^(1/2)))/d^3+1/2*b*c*e*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)/(-
c^2*x^2+1)^(1/2))/d^(5/2)/(c^2*d+e)^(1/2)-1/2*b*c*(-c^2*x^2+1)^(1/2)/d^2/x
```

Rubi [A] (verified)

Time = 0.73 (sec) , antiderivative size = 632, normalized size of antiderivative = 1.00, number of steps used = 30, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.619$, Rules used = {4817, 4723, 270, 4721, 3798, 2221, 2317, 2438, 4813, 385, 211, 4825, 4617}

$$\int \frac{a+b\arcsin(cx)}{x^3(d+ex^2)^2}\,dx = \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{d^3} + \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{d^3} + \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{d^3} + \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{d^3} - \frac{2e\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^3} - \frac{e(a+b\arcsin(cx))}{2d^2(d+ex^2)} - \frac{a+b\arcsin(cx)}{2d^2x^2} - \frac{ibe\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{d^3} - \frac{ibe\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{d^3} - \frac{ibe\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{d^3} - \frac{ibe\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{d^3} + \frac{ibe\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^3} + \frac{bce\arctan\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} - \frac{bc\sqrt{1-c^2x^2}}{2d^2x}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^2),x]
```

```
[Out] -1/2*(b*c*Sqrt[1 - c^2*x^2])/(d^2*x) - (a + b*ArcSin[c*x])/(2*d^2*x^2) - (e
*(a + b*ArcSin[c*x]))/(2*d^2*(d + e*x^2)) + (b*c*e*ArcTan[(Sqrt[c^2*d + e]*
x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(2*d^(5/2)*Sqrt[c^2*d + e]) + (e*(a + b*Ar
cSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d +
 e])])/d^3 + (e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*
c*Sqrt[-d] - Sqrt[c^2*d + e])])/d^3 + (e*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[
e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^3 + (e*(a + b*Ar
cSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d +
 e])])/d^3 - (2*e*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/d^3 -
 (I*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d
 + e]))])/d^3 - (I*b*e*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d]
 - Sqrt[c^2*d + e])])/d^3 - (I*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))
/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d^3 - (I*b*e*PolyLog[2, (Sqrt[e]*E^(I*
ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^3 + (I*b*e*PolyLog[2, E^
((2*I)*ArcSin[c*x])])/d^3
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
```

```
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a+b\arcsin(cx)}{d^2x^3} - \frac{2e(a+b\arcsin(cx))}{d^3x} + \frac{e^2x(a+b\arcsin(cx))}{d^2(d+ex^2)^2} + \frac{2e^2x(a+b\arcsin(cx))}{d^3(d+ex^2)}\right)dx$$

$$= \frac{\int \frac{a+b\arcsin(cx)}{x^3}\,dx}{d^2} - \frac{(2e)\int \frac{a+b\arcsin(cx)}{x}\,dx}{d^3} + \frac{(2e^2)\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx}{d^3} + \frac{e^2\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx}{d^2}$$

$$= -\frac{a+b\arcsin(cx)}{2d^2x^2} - \frac{e(a+b\arcsin(cx))}{2d^2(d+ex^2)} + \frac{(bc)\int \frac{1}{x^2\sqrt{1-c^2x^2}}\,dx}{2d^2} - \frac{(2e)\text{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \arcsin(cx)\right)}{d^3} + \frac{(bce)\int \frac{1}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{2d^2} + \frac{(2e^2)\int \left(-\frac{a+b\arcsin(cx)}{2\sqrt{e}(\sqrt{-d}-\sqrt{e}x)} + \frac{a+b\arcsin(cx)}{2\sqrt{e}(\sqrt{-d}+\sqrt{e}x)}\right)dx}{d^3}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\arcsin(cx)}{2d^2x^2} - \frac{e(a+b\arcsin(cx))}{2d^2(d+ex^2)} + \frac{ie(a+b\arcsin(cx))^2}{bd^3} + \frac{(4ie)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)}{d^3} + \frac{(bce)\text{Subst}\left(\int \frac{1}{d-(-c^2d-e)x^2}\,dx, x, \frac{x}{\sqrt{1-c^2x^2}}\right)}{2d^2} - \frac{e^{3/2}\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{d^3} + \frac{e^{3/2}\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{d^3}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\arcsin(cx)}{2d^2x^2} - \frac{e(a+b\arcsin(cx))}{2d^2(d+ex^2)} + \frac{ie(a+b\arcsin(cx))^2}{bd^3} + \frac{bce\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} - \frac{2e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^3} + \frac{(2be)\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d^3} - \frac{e^{3/2}\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{d^3} + \frac{e^{3/2}\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{d^3}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\arcsin(cx)}{2d^2x^2} - \frac{e(a+b\arcsin(cx))}{2d^2(d+ex^2)} + \frac{bce\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} - \frac{2e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^3} - \frac{(ibe)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx,x,e^{2i\arcsin(cx)}\right)}{d^3} - \frac{\left(ie^{3/2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{d^3} - \frac{\left(ie^{3/2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{d^3} + \frac{\left(ie^{3/2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{d^3} + \frac{\left(ie^{3/2}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{d^3}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\arcsin(cx)}{2d^2x^2} - \frac{e(a+b\arcsin(cx))}{2d^2(d+ex^2)} + \frac{bce\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} + \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{d^3} + \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{d^3} + \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{d^3} + \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{d^3} - \frac{2e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^3} + \frac{ibe\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^3} - \frac{(be)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{d^3} - \frac{(be)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{d^3} - \frac{(be)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{d^3} - \frac{(be)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{d^3}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\arcsin(cx)}{2d^2x^2} - \frac{e(a+b\arcsin(cx))}{2d^2(d+ex^2)} + \frac{bce\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} + \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{d^3} + \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{d^3} + \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{d^3} + \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{d^3} - \frac{2e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^3} + \frac{ibe\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^3} + \frac{(ibe)\mathrm{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{d^3} + \frac{(ibe)\mathrm{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{d^3} + \frac{(ibe)\mathrm{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{d^3} + \frac{(ibe)\mathrm{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{d^3}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^2x} - \frac{a+b\arcsin(cx)}{2d^2x^2} - \frac{e(a+b\arcsin(cx))}{2d^2(d+ex^2)}$$
$$+ \frac{bce\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} + \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{d^3}$$
$$+ \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{d^3}$$
$$+ \frac{e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{d^3}$$
$$+ \frac{e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{d^3}$$
$$- \frac{2e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^3} - \frac{ibe\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{d^3}$$
$$- \frac{ibe\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{d^3} - \frac{ibe\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{d^3}$$
$$- \frac{ibe\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{d^3} + \frac{ibe\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{d^3}$$

Mathematica [A] (verified)

Time = 1.73 (sec) , antiderivative size = 687, normalized size of antiderivative = 1.09

$$\int \frac{a+b\arcsin(cx)}{x^3(d+ex^2)^2}\,dx =$$
$$-\frac{\frac{2ad}{x^2}+\frac{2ade}{d+ex^2}+8ae\log(x)-4ae\log(d+ex^2)+b\left(\frac{2d\left(cx\sqrt{1-c^2x^2}+\arcsin(cx)\right)}{x^2}+\sqrt{d}e\left(\frac{\arcsin(cx)}{\sqrt{d}+i\sqrt{e}x}-\frac{c\arctan\left(\frac{i\sqrt{e}-\cdots}{\sqrt{c^2d+\cdots}}\right)}{\sqrt{c^2d+\cdots}}\right.\right.}{\cdots}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^2),x]
```

```
[Out] -1/4*((2*a*d)/x^2 + (2*a*d*e)/(d + e*x^2) + 8*a*e*Log[x] - 4*a*e*Log[d + e*
x^2] + b*((2*d*(c*x*Sqrt[1 - c^2*x^2] + ArcSin[c*x]))/x^2 + Sqrt[d]*e*(ArcS
in[c*x]/(Sqrt[d] + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sq
rt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - I*Sqrt[d]*e*(-(ArcSin
[c*x]/(I*Sqrt[d] + Sqrt[e]*x)) - (c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sq
rt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) + (2*I)*e*(ArcSin[c*x]*
(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt
[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d
 + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c
^2*d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[
c^2*d + e]))]) + (2*I)*e*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e
```

```
]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E
^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*
E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E
^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]) - (4*I)*e*(ArcSin[c*x]*(A
rcSin[c*x] + (2*I)*Log[1 - E^((2*I)*ArcSin[c*x])]) + PolyLog[2, E^((2*I)*Ar
cSin[c*x])])))/d^3
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 1.96 (sec) , antiderivative size = 589, normalized size of antiderivative = 0.93

method	result
parts	$-\frac{a}{2d^2x^2} - \frac{2ae\ln(x)}{d^3} + \frac{ae\ln(e\,x^2+d)}{d^3} - \frac{ae}{2d^2(e\,x^2+d)} + b\,c^2\left(-\frac{-ic^4d\,x^2-ie\,c^4x^4+\sqrt{-c^2x^2+1}\,c^3dx+\sqrt{-c^2x^2}}{2c^2x^2d^2(c^2}\right.$
derivativedivides	$c^2\left(-\frac{a}{2d^2c^2x^2} - \frac{2ae\ln(cx)}{c^2d^3} - \frac{ae}{2d^2(c^2e\,x^2+c^2d)} + \frac{ae\ln(c^2e\,x^2+c^2d)}{c^2d^3} + b\,c^4\left(-\frac{-ic^4d\,x^2-ie\,c^4x^4+\sqrt{-c^2x^2}}{}\right.\right.$
default	$c^2\left(-\frac{a}{2d^2c^2x^2} - \frac{2ae\ln(cx)}{c^2d^3} - \frac{ae}{2d^2(c^2e\,x^2+c^2d)} + \frac{ae\ln(c^2e\,x^2+c^2d)}{c^2d^3} + b\,c^4\left(-\frac{-ic^4d\,x^2-ie\,c^4x^4+\sqrt{-c^2x^2}}{}\right.\right.$

```
[In] int((a+b*arcsin(c*x))/x^3/(e*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/d^2/x^2-2*a/d^3*e*ln(x)+a*e/d^3*ln(e*x^2+d)-1/2*a*e/d^2/(e*x^2+d)+b*
c^2*(-1/2*(-I*c^4*d*x^2-I*e*c^4*x^4+(-c^2*x^2+1)^(1/2)*c^3*d*x+(-c^2*x^2+1)
^(1/2)*e*c^3*x^3+arcsin(c*x)*c^2*d+2*arcsin(c*x)*c^2*e*x^2)/c^2/x^2/d^2/(c^
2*e*x^2+c^2*d)-2*I*e/d^3/c^2*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+2*I*e/d^3/c^2*
dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-1/2*I*(d*c^2*(c^2*d+e))^(1/2)/d^3/c^2/(c^
2*d+e)*arctanh(1/4*(2*e*(I*c*x+(-c^2*x^2+1)^(1/2))^2-4*c^2*d-2*e)/(c^4*d^2+
c^2*d*e)^(1/2))*e-1/2*I*e/d^3/c^2*sum((_R1^2*e-4*c^2*d-e)/(_R1^2*e-2*c^2*d-
e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(
-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-1/2*I*e^
```

```
2/d^3/c^2*sum((_R1^2-1)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-
c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootO
f(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-2*e/d^3/c^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x
^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)^2}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(ex^2+d\right)^2x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e^2*x^7 + 2*d*e*x^5 + d^2*x^3), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)^2}\,dx=\int \frac{a+b\operatorname{asin}\left(cx\right)}{x^3\left(d+ex^2\right)^2}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x**3/(e*x**2+d)**2,x)
```

```
[Out] Integral((a + b*asin(c*x))/(x**3*(d + e*x**2)**2), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)^2}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(ex^2+d\right)^2x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*((2*e*x^2 + d)/(d^2*e*x^4 + d^3*x^2) - 2*e*log(e*x^2 + d)/d^3 + 4*e*
log(x)/d^3) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e^2*x
^7 + 2*d*e*x^5 + d^2*x^3), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)^2}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^2,x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)^2}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^3\,\left(e\,x^2+d\right)^2}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^3*(d + e*x^2)^2),x)
[Out] int((a + b*asin(c*x))/(x^3*(d + e*x^2)^2), x)
```

3.637 $\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 787

$$\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \frac{ax}{e^2}+\frac{b\sqrt{1-c^2x^2}}{ce^2}+\frac{bx\arcsin(cx)}{e^2} - \frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{bcd\operatorname{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{5/2}\sqrt{c^2d+e}}+\frac{bcd\operatorname{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{5/2}\sqrt{c^2d+e}} + \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4e^{5/2}} - \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4e^{5/2}} + \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4e^{5/2}} - \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4e^{5/2}} + \frac{3ib\sqrt{-d}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4e^{5/2}} - \frac{3ib\sqrt{-d}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4e^{5/2}} + \frac{3ib\sqrt{-d}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4e^{5/2}} - \frac{3ib\sqrt{-d}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4e^{5/2}}$$

```
[Out] a*x/e^2+b*x*arcsin(c*x)/e^2+3/4*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^
(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(5/2)-3/4*(a+
b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2
*d+e)^(1/2)))*(-d)^(1/2)/e^(5/2)+3/4*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^
2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(5/2)-3/
4*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)
+(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(5/2)+3/4*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1
)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(5/2)-3/4*I
*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(
1/2)))*(-d)^(1/2)/e^(5/2)+3/4*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(
1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*(-d)^(1/2)/e^(5/2)-3/4*I*b*polylog(2
,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*(-d)^
```

```
(1/2)/e^(5/2)-1/4*d*(a+b*arcsin(c*x))/e^(5/2)/((-d)^(1/2)-x*e^(1/2))+1/4*d*
(a+b*arcsin(c*x))/e^(5/2)/((-d)^(1/2)+x*e^(1/2))+1/4*b*c*d*arctanh((-c^2*x*
(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/e^(5/2)/(c^2*d+e)^(
1/2)+1/4*b*c*d*arctanh((c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2
+1)^(1/2))/e^(5/2)/(c^2*d+e)^(1/2)+b*(-c^2*x^2+1)^(1/2)/c/e^2
```

Rubi [A] (verified)

Time = 1.42 (sec) , antiderivative size = 787, normalized size of antiderivative = 1.00, number of steps used = 49, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.571$, Rules used = {4817, 4715, 267, 4757, 4827, 739, 212, 4825, 4617, 2221, 2317, 2438}

$$\begin{aligned}\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = {} & \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4e^{5/2}} \\ & -\frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4e^{5/2}} \\ & +\frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4e^{5/2}} \\ & -\frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4e^{5/2}} \\ & -\frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} \\ & +\frac{ax}{e^2}+\frac{3ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{4e^{5/2}} \\ & -\frac{3ib\sqrt{-d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{4e^{5/2}} \\ & +\frac{3ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{4e^{5/2}} \\ & -\frac{3ib\sqrt{-d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{4e^{5/2}} \\ & +\frac{bx\arcsin(cx)}{e^2}+\frac{bcd\,\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{1-c^2x^2}\sqrt{c^2d+e}}\right)}{4e^{5/2}\sqrt{c^2d+e}} \\ & +\frac{bcd\,\text{arctanh}\left(\frac{c^2\sqrt{-d}x+\sqrt{e}}{\sqrt{1-c^2x^2}\sqrt{c^2d+e}}\right)}{4e^{5/2}\sqrt{c^2d+e}}+\frac{b\sqrt{1-c^2x^2}}{ce^2}\end{aligned}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (a*x)/e^2 + (b*Sqrt[1 - c^2*x^2])/(c*e^2) + (b*x*ArcSin[c*x])/e^2 - (d*(a +
 b*ArcSin[c*x]))/(4*e^(5/2)*(Sqrt[-d] - Sqrt[e]*x)) + (d*(a + b*ArcSin[c*x]
```

```
))/(4*e^(5/2)*(Sqrt[-d] + Sqrt[e]*x)) + (b*c*d*ArcTanh[(Sqrt[e] - c^2*Sqrt[
-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*e^(5/2)*Sqrt[c^2*d + e]) +
(b*c*d*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2
])])/(4*e^(5/2)*Sqrt[c^2*d + e]) + (3*Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 -
(Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*e^(5/2))
- (3*Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*
Sqrt[-d] - Sqrt[c^2*d + e])])/(4*e^(5/2)) + (3*Sqrt[-d]*(a + b*ArcSin[c*x])
*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*
e^(5/2)) - (3*Sqrt[-d]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x
]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*e^(5/2)) + (((3*I)/4)*b*Sqrt[-d]*
PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))]
)/e^(5/2) - (((3*I)/4)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] - Sqrt[c^2*d + e])])/e^(5/2) + (((3*I)/4)*b*Sqrt[-d]*PolyLog[2,
 -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/e^(5/2)
- (((3*I)/4)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d
] + Sqrt[c^2*d + e])])/e^(5/2)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
```

```
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a+b\arcsin(cx)}{e^2}+\frac{d^2(a+b\arcsin(cx))}{e^2(d+ex^2)^2}-\frac{2d(a+b\arcsin(cx))}{e^2(d+ex^2)}\right)dx$$

$$= \frac{\int (a+b\arcsin(cx))\,dx}{e^2}-\frac{(2d)\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx}{e^2}+\frac{d^2\int \frac{a+b\arcsin(cx)}{(d+ex^2)^2}\,dx}{e^2}$$

$$= \frac{ax}{e^2}+\frac{b\int \arcsin(cx)\,dx}{e^2}-\frac{(2d)\int \left(\frac{\sqrt{-d}(a+b\arcsin(cx))}{2d(\sqrt{-d}-\sqrt{e}x)}+\frac{\sqrt{-d}(a+b\arcsin(cx))}{2d(\sqrt{-d}+\sqrt{e}x)}\right)dx}{e^2}$$
$$+\frac{d^2\int \left(-\frac{e(a+b\arcsin(cx))}{4d(\sqrt{-d}\sqrt{e}-ex)^2}-\frac{e(a+b\arcsin(cx))}{4d(\sqrt{-d}\sqrt{e}+ex)^2}-\frac{e(a+b\arcsin(cx))}{2d(-de-e^2x^2)}\right)dx}{e^2}$$

$$= \frac{ax}{e^2}+\frac{bx\arcsin(cx)}{e^2}-\frac{(bc)\int \frac{x}{\sqrt{1-c^2x^2}}\,dx}{e^2}-\frac{\sqrt{-d}\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{e^2}$$
$$-\frac{\sqrt{-d}\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{e^2}-\frac{d\int \frac{a+b\arcsin(cx)}{(\sqrt{-d}\sqrt{e}-ex)^2}\,dx}{4e}$$
$$-\frac{d\int \frac{a+b\arcsin(cx)}{(\sqrt{-d}\sqrt{e}+ex)^2}\,dx}{4e}-\frac{d\int \frac{a+b\arcsin(cx)}{-de-e^2x^2}\,dx}{2e}$$

$$= \frac{ax}{e^2}+\frac{b\sqrt{1-c^2x^2}}{ce^2}+\frac{bx\arcsin(cx)}{e^2}-\frac{d(a+b\arcsin(cx))}{4e^{5/2}(\sqrt{-d}-\sqrt{e}x)}$$
$$+\frac{d(a+b\arcsin(cx))}{4e^{5/2}(\sqrt{-d}+\sqrt{e}x)}-\frac{\sqrt{-d}\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{e^2}$$
$$-\frac{\sqrt{-d}\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{e^2}+\frac{(bcd)\int \frac{1}{(\sqrt{-d}\sqrt{e}-ex)\sqrt{1-c^2x^2}}\,dx}{4e^2}$$
$$-\frac{(bcd)\int \frac{1}{(\sqrt{-d}\sqrt{e}+ex)\sqrt{1-c^2x^2}}\,dx}{4e^2}-\frac{d\int \left(-\frac{\sqrt{-d}(a+b\arcsin(cx))}{2de(\sqrt{-d}-\sqrt{e}x)}-\frac{\sqrt{-d}(a+b\arcsin(cx))}{2de(\sqrt{-d}+\sqrt{e}x)}\right)dx}{2e}$$

$$=\frac{ax}{e^2}+\frac{b\sqrt{1-c^2x^2}}{ce^2}+\frac{bx\arcsin(cx)}{e^2}-\frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$-\frac{\left(i\sqrt{-d}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{e^2}$$
$$-\frac{\left(i\sqrt{-d}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{e^2}$$
$$-\frac{\left(i\sqrt{-d}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{e^2}$$
$$-\frac{\left(i\sqrt{-d}\right)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{e^2}+\frac{\sqrt{-d}\int\frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{4e^2}$$
$$+\frac{\sqrt{-d}\int\frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{4e^2}-\frac{(bcd)\text{Subst}\left(\int\frac{1}{c^2de+e^2-x^2}\,dx,x,\frac{-e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{4e^2}$$
$$+\frac{(bcd)\text{Subst}\left(\int\frac{1}{c^2de+e^2-x^2}\,dx,x,\frac{e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{4e^2}$$

$$= \frac{ax}{e^2} + \frac{b\sqrt{1-c^2x^2}}{ce^2} + \frac{bx\arcsin(cx)}{e^2} - \frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)}$$

$$+ \frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{bcd\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{5/2}\sqrt{c^2d+e}}$$

$$+ \frac{bcd\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{5/2}\sqrt{c^2d+e}} + \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{e^{5/2}}$$

$$- \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{e^{5/2}}$$

$$+ \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{e^{5/2}}$$

$$- \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{e^{5/2}}$$

$$- \frac{\left(b\sqrt{-d}\right)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{e^{5/2}}$$

$$+ \frac{\left(b\sqrt{-d}\right)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{e^{5/2}}$$

$$- \frac{\left(b\sqrt{-d}\right)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{e^{5/2}}$$

$$+ \frac{\left(b\sqrt{-d}\right)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{e^{5/2}}$$

$$+ \frac{\sqrt{-d}\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}dx, x, \arcsin(cx)\right)}{4e^2}$$

$$+ \frac{\sqrt{-d}\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}dx, x, \arcsin(cx)\right)}{4e^2}$$

$$= \frac{ax}{e^2} + \frac{b\sqrt{1-c^2x^2}}{ce^2} + \frac{bx\arcsin(cx)}{e^2} - \frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)}$$

$$+ \frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{bcd\,\mathrm{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{5/2}\sqrt{c^2d+e}}$$

$$+ \frac{bcd\,\mathrm{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{5/2}\sqrt{c^2d+e}} + \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{e^{5/2}}$$

$$- \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{e^{5/2}}$$

$$+ \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{e^{5/2}}$$

$$- \frac{\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{e^{5/2}}$$

$$+ \frac{\left(ib\sqrt{-d}\right)\mathrm{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{e^{5/2}}$$

$$- \frac{\left(ib\sqrt{-d}\right)\mathrm{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{e^{5/2}}$$

$$+ \frac{\left(ib\sqrt{-d}\right)\mathrm{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{e^{5/2}}$$

$$- \frac{\left(ib\sqrt{-d}\right)\mathrm{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{e^{5/2}}$$

$$+ \frac{\left(i\sqrt{-d}\right)\mathrm{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{4e^2}$$

$$+ \frac{\left(i\sqrt{-d}\right)\mathrm{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{4e^2}$$

$$+ \frac{\left(i\sqrt{-d}\right)\mathrm{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{4e^2}$$

$$+ \frac{\left(i\sqrt{-d}\right)\mathrm{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{4e^2}$$

$$
\begin{aligned}
&= \frac{ax}{e^2} + \frac{b\sqrt{1-c^2x^2}}{ce^2} + \frac{bx\arcsin(cx)}{e^2} - \frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} \\
&+ \frac{bcd\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{5/2}\sqrt{c^2d+e}} + \frac{bcd\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{5/2}\sqrt{c^2d+e}} \\
&+ \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4e^{5/2}} \\
&- \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4e^{5/2}} \\
&+ \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4e^{5/2}} \\
&- \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4e^{5/2}} \\
&+ \frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{e^{5/2}} - \frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{e^{5/2}} \\
&+ \frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{e^{5/2}} - \frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{e^{5/2}} \\
&+ \frac{\left(b\sqrt{-d}\right)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx, x, \arcsin(cx)\right)}{4e^{5/2}} \\
&- \frac{\left(b\sqrt{-d}\right)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx, x, \arcsin(cx)\right)}{4e^{5/2}} \\
&+ \frac{\left(b\sqrt{-d}\right)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx, x, \arcsin(cx)\right)}{4e^{5/2}} \\
&- \frac{\left(b\sqrt{-d}\right)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx, x, \arcsin(cx)\right)}{4e^{5/2}}
\end{aligned}
$$

$$= \frac{ax}{e^2} + \frac{b\sqrt{1-c^2x^2}}{ce^2} + \frac{bx\arcsin(cx)}{e^2} - \frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$+ \frac{bcd\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{5/2}\sqrt{c^2d+e}} + \frac{bcd\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{5/2}\sqrt{c^2d+e}}$$
$$+ \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4e^{5/2}}$$
$$- \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4e^{5/2}}$$
$$+ \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4e^{5/2}}$$
$$- \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4e^{5/2}}$$
$$+ \frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{e^{5/2}} - \frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{e^{5/2}}$$
$$+ \frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{e^{5/2}} - \frac{ib\sqrt{-d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{e^{5/2}}$$
$$- \frac{\left(ib\sqrt{-d}\right)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{4e^{5/2}}$$
$$+ \frac{\left(ib\sqrt{-d}\right)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{4e^{5/2}}$$
$$- \frac{\left(ib\sqrt{-d}\right)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{4e^{5/2}}$$
$$+ \frac{\left(ib\sqrt{-d}\right)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{4e^{5/2}}$$

$$
\begin{aligned}
&= \frac{ax}{e^2} + \frac{b\sqrt{1-c^2x^2}}{ce^2} + \frac{bx\arcsin(cx)}{e^2} - \frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{d(a+b\arcsin(cx))}{4e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} \\
&+ \frac{bcd\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{5/2}\sqrt{c^2d+e}} + \frac{bcd\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{5/2}\sqrt{c^2d+e}} \\
&+ \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4e^{5/2}} \\
&- \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4e^{5/2}} \\
&+ \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4e^{5/2}} \\
&- \frac{3\sqrt{-d}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4e^{5/2}} \\
&+ \frac{3ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4e^{5/2}} - \frac{3ib\sqrt{-d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4e^{5/2}} \\
&+ \frac{3ib\sqrt{-d}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4e^{5/2}} - \frac{3ib\sqrt{-d}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4e^{5/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 1.12 (sec) , antiderivative size = 649, normalized size of antiderivative = 0.82

$$
\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx
$$

$$
= \frac{8a\sqrt{e}x + \frac{4ad\sqrt{e}x}{d+ex^2} - 12a\sqrt{d}\arctan\left(\frac{\sqrt{e}x}{\sqrt{d}}\right) + b\left(\frac{8\sqrt{e}\left(\sqrt{1-c^2x^2}+cx\arcsin(cx)\right)}{c} + 2id\left(\frac{\arcsin(cx)}{\sqrt{d}+i\sqrt{e}x} - \frac{c\arctan\left(\frac{i\sqrt{e}+c^2\sqrt{d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right.\right.}{}
$$

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (8*a*Sqrt[e]*x + (4*a*d*Sqrt[e]*x)/(d + e*x^2) - 12*a*Sqrt[d]*ArcTan[(Sqrt[
e]*x)/Sqrt[d]] + b*((8*Sqrt[e]*(Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x]))/c + (
2*I)*d*(ArcSin[c*x]/(Sqrt[d] + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sq
rt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) + 2*d*(ArcS
in[c*x]/(I*Sqrt[d] + Sqrt[e]*x) + (c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(S
qrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) + 3*Sqrt[d]*(ArcSin[c*
x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - S
qrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^
2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqr
t[c^2*d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sq
rt[c^2*d + e]))]) - 3*Sqrt[d]*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (S
```

```
qrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt
[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqr
t[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt
[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])))/(8*e^(5/2))
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 4.87 (sec) , antiderivative size = 898, normalized size of antiderivative = 1.14

method	result
parts	$a\left(\frac{x}{e^2}-\frac{d\left(-\frac{x}{2(e\,x^2+d)}+\frac{3\arctan\left(\frac{ex}{\sqrt{de}}\right)}{2\sqrt{de}}\right)}{e^2}\right)+\frac{b\left(\frac{\left(-i\sqrt{-c^2x^2+1}+cx\right)c^4(\arcsin(cx)+i)}{2e^2}+\frac{\left(cx+i\sqrt{-c^2x^2+1}\right)c^4(\arcsin(cx\ldots\right.}{\ldots}$
derivativedivides	$\frac{a\,c^4\left(\frac{cx}{e^2}-\frac{d\,c^2\left(-\frac{cx}{2(c^2e\,x^2+c^2d)}+\frac{3\arctan\left(\frac{ex}{\sqrt{de}}\right)}{2c\sqrt{de}}\right)}{e^2}\right)+b\,c^4\left(\frac{\left(-i\sqrt{-c^2x^2+1}+cx\right)(\arcsin(cx)+i)}{2e^2}+\frac{\left(cx+i\sqrt{-c^2x^2+1}\right)(\arcsin(cx)\ldots\right.}{\ldots}$
default	$\frac{a\,c^4\left(\frac{cx}{e^2}-\frac{d\,c^2\left(-\frac{cx}{2(c^2e\,x^2+c^2d)}+\frac{3\arctan\left(\frac{ex}{\sqrt{de}}\right)}{2c\sqrt{de}}\right)}{e^2}\right)+b\,c^4\left(\frac{\left(-i\sqrt{-c^2x^2+1}+cx\right)(\arcsin(cx)+i)}{2e^2}+\frac{\left(cx+i\sqrt{-c^2x^2+1}\right)(\arcsin(cx)\ldots\right.}{\ldots}$

```
[In] int(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] a*(1/e^2*x-1/e^2*d*(-1/2*x/(e*x^2+d)+3/2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2)
)))+b/c^5*(1/2*(-I*(-c^2*x^2+1)^(1/2)+c*x)*c^4*(arcsin(c*x)+I)/e^2+1/2*(c*x
+I*(-c^2*x^2+1)^(1/2))*c^4*(arcsin(c*x)-I)/e^2+1/2*c^7*arcsin(c*x)/e^2*d*x/
(c^2*e*x^2+c^2*d)-1/2*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*(2*d
^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)
*d*c^6*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(
1/2)-e)*e)^(1/2))/e^5/(c^2*d+e)+1/2*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+
e))^(1/2)*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*arctan(e*(I*c*x+(-c^2*x^2+1
```

```
)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))*d*c^6/e^5-1/2*((
2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*(-2*(d*c^2*(c^2*d+e))^(1/2)*d
*c^2+2*d^2*c^4+2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*d*c^6*arctanh(e*(I*c*x+
(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^5/(c
^2*d+e)+1/2*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*(2*c^2*d-2*(d*c
^2*(c^2*d+e))^(1/2)+e)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*
c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))*d*c^6/e^5-3/4*d/e^2*c^6*sum(1/_R1/(_R1^2*
e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_
R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e)
)-3/4*d/e^2*c^6*sum(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-
c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootO
f(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e)))
```

Fricas [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{(b\arcsin{(cx)}+a)x^4}{(ex^2+d)^2}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{x^4(a+b\operatorname{asin}{(cx)})}{(d+ex^2)^2}\,dx$$

```
[In] integrate(x**4*(a+b*asin(c*x))/(e*x**2+d)**2,x)
[Out] Integral(x**4*(a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^4}{(ex^2+d)^2}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^4/(e*x^2 + d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{x^4\,(a+b\,\mathrm{asin}(c\,x))}{(e\,x^2+d)^2}\,dx$$

```
[In] int((x^4*(a + b*asin(c*x)))/(d + e*x^2)^2,x)
[Out] int((x^4*(a + b*asin(c*x)))/(d + e*x^2)^2, x)
```

3.638 $\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 745

$$\begin{aligned}\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx &= \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} \\
&- \frac{b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}} - \frac{b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}} \\
&+ \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&- \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&+ \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&- \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&+ \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&- \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&+ \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&- \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}}\end{aligned}$$

```
[Out] 1/4*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/
2)-(c^2*d+e)^(1/2)))/e^(3/2)/(-d)^(1/2)-1/4*(a+b*arcsin(c*x))*ln(1+(I*c*x+(
-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^(3/2)/(-d)^(
1/2)+1/4*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d
)^(1/2)+(c^2*d+e)^(1/2)))/e^(3/2)/(-d)^(1/2)-1/4*(a+b*arcsin(c*x))*ln(1+(I*
c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(3/2)/(
-d)^(1/2)+1/4*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(
1/2)-(c^2*d+e)^(1/2)))/e^(3/2)/(-d)^(1/2)-1/4*I*b*polylog(2,(I*c*x+(-c^2*x^
2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^(3/2)/(-d)^(1/2)+1/
4*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+
e)^(1/2)))/e^(3/2)/(-d)^(1/2)-1/4*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*
e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(3/2)/(-d)^(1/2)+1/4*(a+b*arcsi
n(c*x))/e^(3/2)/((-d)^(1/2)-x*e^(1/2))+1/4*(-a-b*arcsin(c*x))/e^(3/2)/((-d)
^(1/2)+x*e^(1/2))-1/4*b*c*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/
2)/(-c^2*x^2+1)^(1/2))/e^(3/2)/(c^2*d+e)^(1/2)-1/4*b*c*arctanh((c^2*x*(-d)^
(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/e^(3/2)/(c^2*d+e)^(1/2)
```

Rubi [A] (verified)

Time = 1.34 (sec) , antiderivative size = 745, normalized size of antiderivative = 1.00, number of steps used = 46, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.476$, Rules

used = {4817, 4757, 4827, 739, 212, 4825, 4617, 2221, 2317, 2438}

$$
\begin{aligned}
\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx &= \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}e^{3/2}} \\
&\quad - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}e^{3/2}} \\
&\quad + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}e^{3/2}} \\
&\quad - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}e^{3/2}} \\
&\quad + \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} \\
&\quad + \frac{ib\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&\quad - \frac{ib\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&\quad + \frac{ib\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&\quad - \frac{ib\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&\quad - \frac{bc\operatorname{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{1-c^2x^2}\sqrt{c^2d+e}}\right)}{4e^{3/2}\sqrt{c^2d+e}} - \frac{bc\operatorname{arctanh}\left(\frac{c^2\sqrt{-d}x+\sqrt{e}}{\sqrt{1-c^2x^2}\sqrt{c^2d+e}}\right)}{4e^{3/2}\sqrt{c^2d+e}}
\end{aligned}
$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (a + b*ArcSin[c*x])/(4*e^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) - (a + b*ArcSin[c*x]
)/(4*e^(3/2)*(Sqrt[-d] + Sqrt[e]*x)) - (b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]
*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*e^(3/2)*Sqrt[c^2*d + e]) - (b*
c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/
(4*e^(3/2)*Sqrt[c^2*d + e]) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*Sqrt[-d]*e^(3/2)) - ((a +
 b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^
2*d + e])])/(4*Sqrt[-d]*e^(3/2)) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^
(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*Sqrt[-d]*e^(3/2)) -
((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sq
rt[c^2*d + e])])/(4*Sqrt[-d]*e^(3/2)) + ((I/4)*b*PolyLog[2, -((Sqrt[e]*E^(I
*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/(Sqrt[-d]*e^(3/2)) - ((I
/4)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e
```

```
])])/(Sqrt[-d]*e^(3/2)) + ((I/4)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))
/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(Sqrt[-d]*e^(3/2)) - ((I/4)*b*PolyLog[
2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]
*e^(3/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(-\frac{d(a+b\arcsin(cx))}{e\left(d+ex^2\right)^2}+\frac{a+b\arcsin(cx)}{e\left(d+ex^2\right)}\right)dx\\
&= \frac{\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx}{e}-\frac{d\int \frac{a+b\arcsin(cx)}{\left(d+ex^2\right)^2}\,dx}{e}\\
&= \frac{\int \left(\frac{\sqrt{-d}(a+b\arcsin(cx))}{2d\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\sqrt{-d}(a+b\arcsin(cx))}{2d\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{e}\\
&\quad-\frac{d\int \left(-\frac{e(a+b\arcsin(cx))}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)^2}-\frac{e(a+b\arcsin(cx))}{4d\left(\sqrt{-d}\sqrt{e}+ex\right)^2}-\frac{e(a+b\arcsin(cx))}{2d\left(-de-e^2x^2\right)}\right)dx}{e}\\
&= \frac{1}{4}\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}\,dx+\frac{1}{4}\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}\,dx\\
&\quad+\frac{1}{2}\int \frac{a+b\arcsin(cx)}{-de-e^2x^2}\,dx-\frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2\sqrt{-d}e}-\frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2\sqrt{-d}e}
\end{aligned}
$$

$$= \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{1}{2}\int\left(-\frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx - \frac{(bc)\int\frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)\sqrt{1-c^2x^2}}\,dx}{4e} + \frac{(bc)\int\frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)\sqrt{1-c^2x^2}}\,dx}{4e} - \frac{\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}e} - \frac{\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}e}$$

$$= \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{(bc)\text{Subst}\left(\int\frac{1}{c^2de+e^2-x^2}\,dx,x,\frac{-e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{4e} - \frac{(bc)\text{Subst}\left(\int\frac{1}{c^2de+e^2-x^2}\,dx,x,\frac{e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{4e} - \frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}e} - \frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}e} - \frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}e} - \frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}e} + \frac{\int\frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{4\sqrt{-d}e} + \frac{\int\frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{4\sqrt{-d}e}$$

$$= \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}}$$

$$- \frac{b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}}$$

$$- \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}}$$

$$+ \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}}$$

$$- \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}}$$

$$- \frac{b\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2\sqrt{-d}e^{3/2}}$$

$$+ \frac{b\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2\sqrt{-d}e^{3/2}}$$

$$- \frac{b\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2\sqrt{-d}e^{3/2}}$$

$$+ \frac{b\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2\sqrt{-d}e^{3/2}}$$

$$+ \frac{\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}dx, x, \arcsin(cx)\right)}{4\sqrt{-d}e}$$

$$+ \frac{\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}dx, x, \arcsin(cx)\right)}{4\sqrt{-d}e}$$

$$=\frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}-\frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}}$$
$$-\frac{b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}}$$
$$-\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}}$$
$$+\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}}$$
$$-\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}}$$
$$+\frac{(ib)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2\sqrt{-d}e^{3/2}}$$
$$-\frac{(ib)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2\sqrt{-d}e^{3/2}}$$
$$+\frac{(ib)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2\sqrt{-d}e^{3/2}}$$
$$-\frac{(ib)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2\sqrt{-d}e^{3/2}}$$
$$+\frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}dx,x,\arcsin(cx)\right)}{4\sqrt{-d}e}$$
$$+\frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}dx,x,\arcsin(cx)\right)}{4\sqrt{-d}e}$$
$$+\frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}dx,x,\arcsin(cx)\right)}{4\sqrt{-d}e}$$
$$+\frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}dx,x,\arcsin(cx)\right)}{4\sqrt{-d}e}$$

$$= \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}}$$
$$- \frac{b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}}$$
$$- \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}}$$
$$- \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}}$$
$$+ \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}}$$
$$+ \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}}$$
$$+ \frac{b\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4\sqrt{-d}e^{3/2}}$$
$$- \frac{b\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4\sqrt{-d}e^{3/2}}$$
$$+ \frac{b\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4\sqrt{-d}e^{3/2}}$$
$$- \frac{b\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4\sqrt{-d}e^{3/2}}$$

$$= \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{b c \operatorname{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}} - \frac{b c \operatorname{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} + \frac{ib\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}} - \frac{ib\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}} + \frac{ib\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}} - \frac{ib\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{3/2}} - \frac{(ib)\operatorname{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{4\sqrt{-d}e^{3/2}} + \frac{(ib)\operatorname{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{4\sqrt{-d}e^{3/2}} - \frac{(ib)\operatorname{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{4\sqrt{-d}e^{3/2}} + \frac{(ib)\operatorname{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{4\sqrt{-d}e^{3/2}}$$

$$
\begin{aligned}
&= \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{a+b\arcsin(cx)}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc\operatorname{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}} \\
&- \frac{bc\operatorname{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4e^{3/2}\sqrt{c^2d+e}} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&- \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&+ \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&- \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&+ \frac{ib\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} - \frac{ib\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} \\
&+ \frac{ib\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}} - \frac{ib\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4\sqrt{-d}e^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.88 (sec) , antiderivative size = 603, normalized size of antiderivative = 0.81

$$
\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx
$$

$$
= \frac{-\frac{4a\sqrt{e}x}{d+ex^2} + \frac{4a\arctan\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}} + b\left(-\frac{2\arcsin(cx)}{i\sqrt{d}+\sqrt{e}x} - 2i\left(\frac{\arcsin(cx)}{\sqrt{d}+i\sqrt{e}x} - \frac{c\arctan\left(\frac{i\sqrt{e}+c^2\sqrt{d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right) - \frac{2c\operatorname{arctanh}\left(\frac{\sqrt{e}+ic^2\sqrt{d}x}{\sqrt{c^2d+e}\sqrt{1-c^2}\cdots}\right)}{\sqrt{c^2d+e}}\cdots\right.}{\cdots}
$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] ((-4*a*Sqrt[e]*x)/(d + e*x^2) + (4*a*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/Sqrt[d] +
 b*((-2*ArcSin[c*x])/(I*Sqrt[d] + Sqrt[e]*x) - (2*I)*(ArcSin[c*x]/(Sqrt[d]
+ I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqr
t[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - (2*c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*
x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e] - (ArcSin[c*x]*(Ar
cSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^
2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d +
e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*
d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2
*d + e]))])/Sqrt[d] + (ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E
^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I
*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(
```

```
I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I
*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])/Sqrt[d]))/(8*e^(3/2))
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 3.86 (sec) , antiderivative size = 811, normalized size of antiderivative = 1.09

method	result
derivativedivides	$\frac{-\frac{a c^5 x}{2e\left(c^2 e x^2+c^2 d\right)}+\frac{a c^3 \arctan\left(\frac{ex}{\sqrt{de}}\right)}{2e\sqrt{de}}+b c^4\left(-\frac{\arcsin(cx)cx}{2e\left(c^2 e x^2+c^2 d\right)}-\frac{\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\frac{i\arcsin(cx)\ln\left(-\right.}{}}{4e}\right.}{}$
default	$\frac{-\frac{a c^5 x}{2e\left(c^2 e x^2+c^2 d\right)}+\frac{a c^3 \arctan\left(\frac{ex}{\sqrt{de}}\right)}{2e\sqrt{de}}+b c^4\left(-\frac{\arcsin(cx)cx}{2e\left(c^2 e x^2+c^2 d\right)}-\frac{\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\frac{i\arcsin(cx)\ln\left(-\right.}{}}{4e}\right.}{}$
parts	$-\frac{ax}{2e\left(e x^2+d\right)}+\frac{a\arctan\left(\frac{ex}{\sqrt{de}}\right)}{2e\sqrt{de}}+\frac{b\left(-\frac{c^5\arcsin(cx)x}{2e\left(c^2 e x^2+c^2 d\right)}+\frac{c^4\left(\sum_{\_R1=\mathrm{RootOf}\left(e\_Z^4+\left(-4c^2d-2e\right)\_Z^2+e\right)}\frac{i\arcsin(cx)\ln\left(-\right.}{}\right.}{4e}\right.}{}$

```
[In] int(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^2,x,method=_RETURNVERBOSE)

[Out] 1/c^3*(-1/2*a*c^5/e*x/(c^2*e*x^2+c^2*d)+1/2*a*c^3/e/(d*e)^(1/2)*arctan(e*x/
(d*e)^(1/2))+b*c^4*(-1/2*arcsin(c*x)/e*c*x/(c^2*e*x^2+c^2*d)-1/4/e*sum(1/_R
1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1
)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*
e)*_Z^2+e))-1/4/e*sum(_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x
-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=Ro
otOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/2*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)
+e)*e)^(1/2)*(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(d*c^2*(
c^2*d+e))^(1/2)*e)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*
(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4/(c^2*d+e)-1/2*((2*c^2*d+2*(d*c^2*(c^2*d+e
))^(1/2)+e)*e)^(1/2)*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)*arctanh(e*(I*c*x
+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/e^4+1
```

```
/2*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*(2*d^2*c^4+2*(d*c^2*(c^
2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)*arctan(e*(I*c*x+(-
c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^4/(c^
2*d+e)-1/2*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*(2*c^2*d+2*(d*c
^2*(c^2*d+e))^(1/2)+e)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*
c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/e^4))
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx=\int \frac{(b\arcsin{(cx)}+a)x^2}{(ex^2+d)^2}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b*x^2*arcsin(c*x) + a*x^2)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx=\int \frac{x^2(a+b\,\mathrm{asin}\,(cx))}{(d+ex^2)^2}\,dx$$

```
[In] integrate(x**2*(a+b*asin(c*x))/(e*x**2+d)**2,x)
[Out] Integral(x**2*(a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)x^2}{(ex^2+d)^2}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^2/(e*x^2 + d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))}{(e\,x^2+d)^2}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x)))/(d + e*x^2)^2,x)
[Out] int((x^2*(a + b*asin(c*x)))/(d + e*x^2)^2, x)
```

3.639 $\int \frac{a+b\arcsin(cx)}{(d+ex^2)^2}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 757

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^2}\,dx = -\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}+\frac{b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}-\frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}-\frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$

```
[Out] -1/4*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1
/2)-(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(1/2)+1/4*(a+b*arcsin(c*x))*ln(1+(I*c*x+
(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^
(1/2)-1/4*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-
```

```
d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(1/2)+1/4*(a+b*arcsin(c*x))*ln(1+(I
*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(3/
2)/e^(1/2)-1/4*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^
(1/2)-(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(1/2)+1/4*I*b*polylog(2,(I*c*x+(-c^2*x
^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(1/2)-1
/4*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d
+e)^(1/2)))/(-d)^(3/2)/e^(1/2)+1/4*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))
*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(1/2)+1/4*(-a-b*arc
sin(c*x))/d/e^(1/2)/((-d)^(1/2)-x*e^(1/2))+1/4*(a+b*arcsin(c*x))/d/e^(1/2)/
((-d)^(1/2)+x*e^(1/2))+1/4*b*c*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e
)^(1/2)/(-c^2*x^2+1)^(1/2))/d/e^(1/2)/(c^2*d+e)^(1/2)+1/4*b*c*arctanh((c^2*
x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/d/e^(1/2)/(c^2*d+
e)^(1/2)
```

Rubi [A] (verified)

Time = 0.69 (sec) , antiderivative size = 757, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4757, 4827, 739, 212, 4825, 4617, 2221, 2317, 2438}

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{(d+ex^2)^2}\,dx = &-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}}\\ &+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}}\\ &-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}}\\ &+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}}\\ &-\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}\\ &-\frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{4(-d)^{3/2}\sqrt{e}}\\ &-\frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{4(-d)^{3/2}\sqrt{e}}+\frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{4(-d)^{3/2}\sqrt{e}}\\ &+\frac{bc\,\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{1-c^2x^2}\sqrt{c^2d+e}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}+\frac{bc\,\text{arctanh}\left(\frac{c^2\sqrt{-d}x+\sqrt{e}}{\sqrt{1-c^2x^2}\sqrt{c^2d+e}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^2,x]
```

```
[Out] -1/4*(a + b*ArcSin[c*x])/(d*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)) + (a + b*ArcSin
[c*x])/(4*d*Sqrt[e]*(Sqrt[-d] + Sqrt[e]*x)) + (b*c*ArcTanh[(Sqrt[e] - c^2*S
qrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*d*Sqrt[e]*Sqrt[c^2*d +
e]) + (b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2
*x^2])])/(4*d*Sqrt[e]*Sqrt[c^2*d + e]) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt
[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*(-d)^(3/2)*Sqr
t[e]) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[
-d] - Sqrt[c^2*d + e])])/(4*(-d)^(3/2)*Sqrt[e]) - ((a + b*ArcSin[c*x])*Log[
1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*(-d)^
(3/2)*Sqrt[e]) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(
I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*(-d)^(3/2)*Sqrt[e]) - ((I/4)*b*PolyLog
[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/((-d)
^(3/2)*Sqrt[e]) + ((I/4)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] - Sqrt[c^2*d + e])])/((-d)^(3/2)*Sqrt[e]) - ((I/4)*b*PolyLog[2, -((Sqr
t[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/((-d)^(3/2)*Sqr
t[e]) + ((I/4)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqr
t[c^2*d + e])])/((-d)^(3/2)*Sqrt[e])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(-\frac{e(a+b\arcsin(cx))}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)^2}-\frac{e(a+b\arcsin(cx))}{4d\left(\sqrt{-d}\sqrt{e}+ex\right)^2}-\frac{e(a+b\arcsin(cx))}{2d\left(-de-e^2x^2\right)}\right)dx\\
&= -\frac{e\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}\,dx}{4d}-\frac{e\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}\,dx}{4d}-\frac{e\int \frac{a+b\arcsin(cx)}{-de-e^2x^2}\,dx}{2d}\\
&= -\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{(bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)\sqrt{1-c^2x^2}}\,dx}{4d}\\
&\quad -\frac{(bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)\sqrt{1-c^2x^2}}\,dx}{4d}-\frac{e\int \left(-\frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}-\sqrt{e}x\right)}-\frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{2d}
\end{aligned}
$$

$$= -\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{4(-d)^{3/2}}+\frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{4(-d)^{3/2}} - \frac{(bc)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{-e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{4d}+\frac{(bc)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{4d}$$

$$= -\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{b c\,\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}} + \frac{b c\,\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}+\frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{4(-d)^{3/2}} + \frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{4(-d)^{3/2}}$$

$$= -\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{b c\,\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}} + \frac{b c\,\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}+\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{4(-d)^{3/2}} + \frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{4(-d)^{3/2}} + \frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{4(-d)^{3/2}} + \frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{4(-d)^{3/2}}$$

$$=-\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}$$
$$+\frac{b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$+\frac{b\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$-\frac{b\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$+\frac{b\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$-\frac{b\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4(-d)^{3/2}\sqrt{e}}$$

$$= -\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}$$
$$+ \frac{b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}} - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$- \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$- \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$+ \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$- \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$+ \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{4(-d)^{3/2}\sqrt{e}}$$

$$= -\frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{a+b\arcsin(cx)}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}}$$
$$+ \frac{b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d\sqrt{e}\sqrt{c^2d+e}} - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$- \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$- \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}} + \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$
$$- \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}} + \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{3/2}\sqrt{e}}$$

Mathematica [A] (verified)

Time = 1.17 (sec) , antiderivative size = 591, normalized size of antiderivative = 0.78

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^2}\,dx = \frac{1}{2}\left(\frac{ax}{d^2+dex^2} + \frac{a\arctan\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{3/2}\sqrt{e}}\right.$$
$$+ \frac{b\left(i\sqrt{d}\left(\frac{\arcsin(cx)}{\sqrt{d}+i\sqrt{e}x} - \frac{c\arctan\left(\frac{i\sqrt{e}+c^2\sqrt{d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right) + \sqrt{d}\left(\frac{\arcsin(cx)}{i\sqrt{d}+\sqrt{e}x} + \frac{c\text{arctanh}\left(\frac{\sqrt{e}+ic^2\sqrt{d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right) + i\arcsin(cx)\left(\right.\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^2,x]
```

```
[Out] ((a*x)/(d^2 + d*e*x^2) + (a*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(d^(3/2)*Sqrt[e])
+ (b*(I*Sqrt[d]*(ArcSin[c*x]/(Sqrt[d] + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e]
 + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) +
Sqrt[d]*(ArcSin[c*x]/(I*Sqrt[d] + Sqrt[e]*x) + (c*ArcTanh[(Sqrt[e] + I*c^2*
Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) + I*ArcSi
n[c*x]*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e]
```

```
)] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]) -
I*ArcSin[c*x]*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d
+ e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]
) + PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] -
 PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] -
 PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))] +
 PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]))/(2
*d^(3/2)*Sqrt[e]))/2
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 4.14 (sec) , antiderivative size = 828, normalized size of antiderivative = 1.09

method	result
parts	$\frac{ax}{2d(e\,x^2+d)}+\frac{a\arctan\left(\frac{ex}{\sqrt{de}}\right)}{2d\sqrt{de}}+\frac{b\left(\frac{c^3\arcsin(cx)x}{2d\left(c^2e\,x^2+c^2d\right)}-\frac{\sqrt{-e\left(2c^2d-2\sqrt{d\,c^2\left(c^2d+e\right)}+e\right)}\left(2d^2c^4+2\sqrt{d\,c^2\left(c^2d+e\right)}\,d\,c^2+2c^2e\cdots\right.}{2d\left(c^2d\cdots\right.}\cdots\right.}{\cdots}$
derivativedivides	$\frac{\frac{a\,c^3x}{2d\left(c^2e\,x^2+c^2d\right)}+\frac{ac\arctan\left(\frac{ex}{\sqrt{de}}\right)}{2d\sqrt{de}}+b\,c^4\left(\frac{\arcsin(cx)x}{2cd\left(c^2e\,x^2+c^2d\right)}-\frac{\sqrt{\left(2c^2d+2\sqrt{d\,c^2\left(c^2d+e\right)}+e\right)e}\left(-2\sqrt{d\,c^2\left(c^2d+e\right)}\,d\,c^2+2d^2c^4+2\cdots\right.}{2d\,c^2\left(c\cdots\right.}\cdots\right.}{\cdots}$
default	$\frac{\frac{a\,c^3x}{2d\left(c^2e\,x^2+c^2d\right)}+\frac{ac\arctan\left(\frac{ex}{\sqrt{de}}\right)}{2d\sqrt{de}}+b\,c^4\left(\frac{\arcsin(cx)x}{2cd\left(c^2e\,x^2+c^2d\right)}-\frac{\sqrt{\left(2c^2d+2\sqrt{d\,c^2\left(c^2d+e\right)}+e\right)e}\left(-2\sqrt{d\,c^2\left(c^2d+e\right)}\,d\,c^2+2d^2c^4+2\cdots\right.}{2d\,c^2\left(c\cdots\right.}\cdots\right.}{\cdots}$

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*a*x/d/(e*x^2+d)+1/2*a/d/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+b/c*(1/2*c^
3*arcsin(c*x)*x/d/(c^2*e*x^2+c^2*d)-1/2*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1
/2)+e))^(1/2)*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(
c^2*d+e))^(1/2)*e)*c^2*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*
c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/d/(c^2*d+e)/e^3+1/2*(-e*(2*c^2*d-2*(d*c^2
*(c^2*d+e))^(1/2)+e))^(1/2)*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*arctan(e*
```

```
(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2)
)*c^2/d/e^3-1/2*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*(-2*(d*c^2*
(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*c^2*a
rctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*
e)^(1/2))/d/(c^2*d+e)/e^3+1/2*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/
2)*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2
))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))*c^2/d/e^3+1/4/d*c^2*sum
(1/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))
/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*
d-2*e)*_Z^2+e))+1/4/d*c^2*sum(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R
1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1))
,_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^2}\,dx = \int \frac{b\arcsin(cx)+a}{(ex^2+d)^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^2}\,dx = \int \frac{a+b\operatorname{asin}(cx)}{(d+ex^2)^2}\,dx$$

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**2,x)
[Out] Integral((a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{\left(d+ex^2\right)^2}\,dx = \int \frac{b\arcsin\left(cx\right)+a}{\left(ex^2+d\right)^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{\left(d+ex^2\right)^2}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{\left(e\,x^2+d\right)^2}\,dx$$

```
[In] int((a + b*asin(c*x))/(d + e*x^2)^2,x)
[Out] int((a + b*asin(c*x))/(d + e*x^2)^2, x)
```

3.640 $\int \frac{a+b\arcsin(cx)}{x^2(d+ex^2)^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 795

$$\int \frac{a+b\arcsin(cx)}{x^2(d+ex^2)^2}\,dx = -\frac{a+b\arcsin(cx)}{d^2x}+\frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc\sqrt{e}\operatorname{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}} - \frac{bc\sqrt{e}\operatorname{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}} - \frac{b\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2} - \frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}} + \frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}} - \frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}} + \frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}} - \frac{3ib\sqrt{e}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}} + \frac{3ib\sqrt{e}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}} - \frac{3ib\sqrt{e}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}} + \frac{3ib\sqrt{e}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}}$$

```
[Out] (-a-b*arcsin(c*x))/d^2/x-b*c*arctanh((-c^2*x^2+1)^(1/2))/d^2-3/4*(a+b*arcsi
n(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(
1/2)))*e^(1/2)/(-d)^(5/2)+3/4*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1
/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(5/2)-3/4*(a+b*
arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d
+e)^(1/2)))*e^(1/2)/(-d)^(5/2)+3/4*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+
1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(5/2)-3/4*
I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)
^(1/2)))*e^(1/2)/(-d)^(5/2)+3/4*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^
(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(5/2)-3/4*I*b*polylog(
```

```
2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))*e^(
1/2)/(-d)^(5/2)+3/4*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(
-d)^(1/2)+(c^2*d+e)^(1/2)))*e^(1/2)/(-d)^(5/2)+1/4*(a+b*arcsin(c*x))*e^(1/2
)/d^2/((-d)^(1/2)-x*e^(1/2))-1/4*(a+b*arcsin(c*x))*e^(1/2)/d^2/((-d)^(1/2)+
x*e^(1/2))-1/4*b*c*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^
2*x^2+1)^(1/2))*e^(1/2)/d^2/(c^2*d+e)^(1/2)-1/4*b*c*arctanh((c^2*x*(-d)^(1/
2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))*e^(1/2)/d^2/(c^2*d+e)^(1/2)
```

Rubi [A] (verified)

Time = 1.40 (sec) , antiderivative size = 795, normalized size of antiderivative = 1.00, number of steps used = 50, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.667$, Rules used = {4817, 4723, 272, 65, 214, 4757, 4827, 739, 212, 4825, 4617, 2221, 2317, 2438}

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x^2(d+ex^2)^2}\,dx = &-\frac{3\sqrt{e}\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)(a+b\arcsin(cx))}{4(-d)^{5/2}}\\
&+\frac{3\sqrt{e}\log\left(\frac{e^{i\arcsin(cx)}\sqrt{e}}{ic\sqrt{-d}-\sqrt{dc^2+e}}+1\right)(a+b\arcsin(cx))}{4(-d)^{5/2}}\\
&-\frac{3\sqrt{e}\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)(a+b\arcsin(cx))}{4(-d)^{5/2}}\\
&+\frac{3\sqrt{e}\log\left(\frac{e^{i\arcsin(cx)}\sqrt{e}}{i\sqrt{-d}c+\sqrt{dc^2+e}}+1\right)(a+b\arcsin(cx))}{4(-d)^{5/2}}\\
&-\frac{a+b\arcsin(cx)}{d^2x}+\frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)}-\frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{e}x+\sqrt{-d}\right)}\\
&-\frac{bc\sqrt{e}\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{dc^2+e}}-\frac{bc\sqrt{e}\text{arctanh}\left(\frac{\sqrt{-d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{dc^2+e}}\\
&-\frac{b\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2}-\frac{3ib\sqrt{e}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{4(-d)^{5/2}}\\
&+\frac{3ib\sqrt{e}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{4(-d)^{5/2}}\\
&-\frac{3ib\sqrt{e}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{4(-d)^{5/2}}\\
&+\frac{3ib\sqrt{e}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{4(-d)^{5/2}}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^2*(d + e*x^2)^2),x]
```

```
[Out] -((a + b*ArcSin[c*x])/(d^2*x)) + (Sqrt[e]*(a + b*ArcSin[c*x]))/(4*d^2*(Sqrt
[-d] - Sqrt[e]*x)) - (Sqrt[e]*(a + b*ArcSin[c*x]))/(4*d^2*(Sqrt[-d] + Sqrt[
e]*x)) - (b*c*Sqrt[e]*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*S
qrt[1 - c^2*x^2])])/(4*d^2*Sqrt[c^2*d + e]) - (b*c*Sqrt[e]*ArcTanh[(Sqrt[e]
 + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(4*d^2*Sqrt[c^2*d
+ e]) - (b*c*ArcTanh[Sqrt[1 - c^2*x^2]])/d^2 - (3*Sqrt[e]*(a + b*ArcSin[c*x
])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(
4*(-d)^(5/2)) + (3*Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin
[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(4*(-d)^(5/2)) - (3*Sqrt[e]*(a +
 b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^
2*d + e])])/(4*(-d)^(5/2)) + (3*Sqrt[e]*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e
]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(4*(-d)^(5/2)) - ((
(3*I)/4)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
 Sqrt[c^2*d + e]))])/(-d)^(5/2) + (((3*I)/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*
E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(-d)^(5/2) - (((3*I)/
4)*b*Sqrt[e]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[
c^2*d + e]))])/(-d)^(5/2) + (((3*I)/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*E^(I*A
rcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(-d)^(5/2)
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
```

```
[{a, c, d, e}, x]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a+b\arcsin(cx)}{d^2x^2}-\frac{e(a+b\arcsin(cx))}{d\left(d+ex^2\right)^2}-\frac{e(a+b\arcsin(cx))}{d^2\left(d+ex^2\right)}\right)dx$$

$$=\frac{\int \frac{a+b\arcsin(cx)}{x^2}\,dx}{d^2}-\frac{e\int \frac{a+b\arcsin(cx)}{d+ex^2}\,dx}{d^2}-\frac{e\int \frac{a+b\arcsin(cx)}{\left(d+ex^2\right)^2}\,dx}{d}$$

$$=-\frac{a+b\arcsin(cx)}{d^2x}+\frac{(bc)\int \frac{1}{x\sqrt{1-c^2x^2}}\,dx}{d^2}-\frac{e\int \left(\frac{\sqrt{-d}(a+b\arcsin(cx))}{2d\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\sqrt{-d}(a+b\arcsin(cx))}{2d\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{d^2}-\frac{e\int \left(-\frac{e(a+b\arcsin(cx))}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)^2}-\frac{e(a+b\arcsin(cx))}{4d\left(\sqrt{-d}\sqrt{e}+ex\right)^2}-\frac{e(a+b\arcsin(cx))}{2d\left(-de-e^2x^2\right)}\right)dx}{d}$$

$$=-\frac{a+b\arcsin(cx)}{d^2x}+\frac{(bc)\text{Subst}\left(\int \frac{1}{x\sqrt{1-c^2x}}\,dx,x,x^2\right)}{2d^2}+\frac{e\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2(-d)^{5/2}}+\frac{e\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2(-d)^{5/2}}+\frac{e^2\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}\,dx}{4d^2}+\frac{e^2\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}\,dx}{4d^2}+\frac{e^2\int \frac{a+b\arcsin(cx)}{-de-e^2x^2}\,dx}{2d^2}$$

$$= -\frac{a+b\arcsin(cx)}{d^2x} + \frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{b\text{Subst}\left(\int \frac{1}{\frac{1}{c^2}-\frac{x^2}{c^2}}\,dx, x, \sqrt{1-c^2x^2}\right)}{cd^2} + \frac{e\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{2(-d)^{5/2}} + \frac{e\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{2(-d)^{5/2}} - \frac{(bce)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)\sqrt{1-c^2x^2}}\,dx}{4d^2} + \frac{(bce)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)\sqrt{1-c^2x^2}}\,dx}{4d^2} + \frac{e^2\int \left(-\frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{2d^2}$$

$$= -\frac{a+b\arcsin(cx)}{d^2x} + \frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{b\text{carctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2} + \frac{(ie)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2(-d)^{5/2}} + \frac{(ie)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2(-d)^{5/2}} + \frac{(ie)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2(-d)^{5/2}} + \frac{(ie)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2(-d)^{5/2}} + \frac{e\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{4(-d)^{5/2}} + \frac{e\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{4(-d)^{5/2}} + \frac{(bce)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{-e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{4d^2} - \frac{(bce)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{4d^2}$$

$$= -\frac{a+b\arcsin(cx)}{d^2x} + \frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$- \frac{bc\sqrt{e}\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}} - \frac{bc\sqrt{e}\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}}$$
$$- \frac{b\text{carctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2} - \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$
$$+ \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$
$$- \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$
$$+ \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$
$$+ \frac{\left(b\sqrt{e}\right)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2(-d)^{5/2}}$$
$$- \frac{\left(b\sqrt{e}\right)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2(-d)^{5/2}}$$
$$+ \frac{\left(b\sqrt{e}\right)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2(-d)^{5/2}}$$
$$- \frac{\left(b\sqrt{e}\right)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2(-d)^{5/2}}$$
$$+ \frac{e\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}dx, x, \arcsin(cx)\right)}{4(-d)^{5/2}}$$
$$+ \frac{e\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}dx, x, \arcsin(cx)\right)}{4(-d)^{5/2}}$$

$$= -\frac{a+b\arcsin(cx)}{d^2x} + \frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc\sqrt{e}\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}} - \frac{bc\sqrt{e}\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}} - \frac{b\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2} - \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}} + \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}} - \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}} + \frac{\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}} - \frac{\left(ib\sqrt{e}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2(-d)^{5/2}} + \frac{\left(ib\sqrt{e}\right)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2(-d)^{5/2}} - \frac{\left(ib\sqrt{e}\right)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2(-d)^{5/2}} + \frac{\left(ib\sqrt{e}\right)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2(-d)^{5/2}} + \frac{(ie)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}dx,x,\arcsin(cx)\right)}{4(-d)^{5/2}} + \frac{(ie)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}dx,x,\arcsin(cx)\right)}{4(-d)^{5/2}} + \frac{(ie)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}dx,x,\arcsin(cx)\right)}{4(-d)^{5/2}} + \frac{(ie)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}dx,x,\arcsin(cx)\right)}{4(-d)^{5/2}}$$

$$= -\frac{a+b\arcsin(cx)}{d^2x} + \frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)}$$

$$- \frac{bc\sqrt{e}\operatorname{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}} - \frac{bc\sqrt{e}\operatorname{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}}$$

$$- \frac{b\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2} - \frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}}$$

$$+ \frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}}$$

$$- \frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}}$$

$$+ \frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}}$$

$$- \frac{ib\sqrt{e}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}} + \frac{ib\sqrt{e}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$

$$- \frac{ib\sqrt{e}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}} + \frac{ib\sqrt{e}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}$$

$$+ \frac{\left(b\sqrt{e}\right)\operatorname{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4(-d)^{5/2}}$$

$$- \frac{\left(b\sqrt{e}\right)\operatorname{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4(-d)^{5/2}}$$

$$+ \frac{\left(b\sqrt{e}\right)\operatorname{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4(-d)^{5/2}}$$

$$- \frac{\left(b\sqrt{e}\right)\operatorname{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4(-d)^{5/2}}$$

$$
\begin{aligned}
&= -\frac{a+b\arcsin(cx)}{d^2x}+\frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)}-\frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)} \\
&\quad -\frac{bc\sqrt{e}\operatorname{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}}-\frac{bc\sqrt{e}\operatorname{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}} \\
&\quad -\frac{b\operatorname{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2}-\frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}} \\
&\quad +\frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}} \\
&\quad -\frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}} \\
&\quad +\frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}} \\
&\quad -\frac{ib\sqrt{e}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}+\frac{ib\sqrt{e}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}} \\
&\quad -\frac{ib\sqrt{e}\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}}+\frac{ib\sqrt{e}\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2(-d)^{5/2}} \\
&\quad -\frac{\left(ib\sqrt{e}\right)\operatorname{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{4(-d)^{5/2}} \\
&\quad +\frac{\left(ib\sqrt{e}\right)\operatorname{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{4(-d)^{5/2}} \\
&\quad -\frac{\left(ib\sqrt{e}\right)\operatorname{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{4(-d)^{5/2}} \\
&\quad +\frac{\left(ib\sqrt{e}\right)\operatorname{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{4(-d)^{5/2}}
\end{aligned}
$$

$$= -\frac{a+b\arcsin(cx)}{d^2x} + \frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{e}(a+b\arcsin(cx))}{4d^2\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$- \frac{bc\sqrt{e}\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}} - \frac{bc\sqrt{e}\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{4d^2\sqrt{c^2d+e}}$$
$$- \frac{b\text{arctanh}\left(\sqrt{1-c^2x^2}\right)}{d^2} - \frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}}$$
$$+ \frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}}$$
$$- \frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}}$$
$$+ \frac{3\sqrt{e}(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}}$$
$$- \frac{3ib\sqrt{e}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}} + \frac{3ib\sqrt{e}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}}$$
$$- \frac{3ib\sqrt{e}\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}} + \frac{3ib\sqrt{e}\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{4(-d)^{5/2}}$$

Mathematica [A] (verified)

Time = 1.10 (sec) , antiderivative size = 672, normalized size of antiderivative = 0.85

$$\int \frac{a+b\arcsin(cx)}{x^2(d+ex^2)^2}\,dx$$
$$= \frac{-\frac{8a\sqrt{d}}{x} - \frac{4a\sqrt{d}ex}{d+ex^2} - 12a\sqrt{e}\arctan\left(\frac{\sqrt{e}x}{\sqrt{d}}\right) + b\left(-2i\sqrt{d}\sqrt{e}\left(\frac{\arcsin(cx)}{\sqrt{d}+i\sqrt{e}x} - \frac{c\arctan\left(\frac{i\sqrt{e}+c^2\sqrt{d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right) + 2\sqrt{d}\sqrt{e}\left(-\right.\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^2*(d + e*x^2)^2),x]
```

```
[Out] ((-8*a*Sqrt[d])/x - (4*a*Sqrt[d]*e*x)/(d + e*x^2) - 12*a*Sqrt[e]*ArcTan[(Sq
rt[e]*x)/Sqrt[d]] + b*((-2*I)*Sqrt[d]*Sqrt[e]*(ArcSin[c*x]/(Sqrt[d] + I*Sqr
t[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c
^2*x^2])])/Sqrt[c^2*d + e]) + 2*Sqrt[d]*Sqrt[e]*(-(ArcSin[c*x]/(I*Sqrt[d] +
 Sqrt[e]*x)) - (c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt
[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - (8*Sqrt[d]*(ArcSin[c*x] + c*x*ArcTanh[S
qrt[1 - c^2*x^2]]))/x + 3*Sqrt[e]*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1
+ (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqr
t[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sq
```

rt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2*PolyLog[2, -
((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]) - 3*Sqrt[e]*(
ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*
Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[
d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt
[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[
d] + Sqrt[c^2*d + e])])))/(8*d^(5/2))

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 6.11 (sec) , antiderivative size = 928, normalized size of antiderivative = 1.17

method	result
parts	$a\left(-\frac{1}{d^{2}x}-\frac{e\left(\frac{x}{2e\,x^{2}+2d}+\frac{3\arctan\left(\frac{ex}{\sqrt{de}}\right)}{2\sqrt{de}}\right)}{d^{2}}\right)+bc\left(-\frac{\arcsin(cx)\left(3c^{2}e\,x^{2}+2c^{2}d\right)}{2cx\,d^{2}\left(c^{2}e\,x^{2}+c^{2}d\right)}-\frac{\ln\left(1+icx+\sqrt{-c^{2}x^{2}+1}\right)}{d^{2}}+\right.$
derivativedivides	Expression too large to display
default	Expression too large to display

[In] int((a+b*arcsin(c*x))/x^2/(e*x^2+d)^2,x,method=_RETURNVERBOSE)

[Out] a*(-1/d^2/x-e/d^2*(1/2*x/(e*x^2+d)+3/2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2)))
)+b*c*(-1/2/c/x*arcsin(c*x)*(3*c^2*e*x^2+2*c^2*d)/d^2/(c^2*e*x^2+c^2*d)-1/d
^2*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))+1/d^2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-1)+3/16
/d^3*e/c^2*sum((_R1^2*e-4*c^2*d-e)/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*l
n((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/
_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-3/16/d^3*e/c^2*sum((4*_R1^2
*c^2*d+_R1^2*e-e)/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^
2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(
e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-1/2*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e
))^(1/2)*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*arctan(e*(I*c*x+(-c^2*x^2+1)
^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/d^2/e^2-1/2*((2*c
^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/
2)+e)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1
/2)+e)*e)^(1/2))/d^2/e^2+1/2*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/
2)*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(
1/2)*e)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^
(1/2)-e)*e)^(1/2))/d^2/(c^2*d+e)/e^2+1/2*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2
)+e)*e)^(1/2)*(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(d*c^2*
(c^2*d+e))^(1/2)*e)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2

```
*(c^2*d+e))^(1/2)+e)*e)^(1/2))/d^2/(c^2*d+e)/e^2)
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d+ex^2\right)^2}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(ex^2+d\right)^2x^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)/(e^2*x^6 + 2*d*e*x^4 + d^2*x^2), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d+ex^2\right)^2}\,dx=\int \frac{a+b\,\mathrm{asin}\left(cx\right)}{x^2\left(d+ex^2\right)^2}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x**2/(e*x**2+d)**2,x)
[Out] Integral((a + b*asin(c*x))/(x**2*(d + e*x**2)**2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d+ex^2\right)^2}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d)^2,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d+ex^2\right)^2}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*arcsin(c*x))/x^2/(e*x^2+d)^2,x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^2\left(d+ex^2\right)^2}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{x^2\,\left(e\,x^2+d\right)^2}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^2*(d + e*x^2)^2),x)
[Out] int((a + b*asin(c*x))/(x^2*(d + e*x^2)^2), x)
```

3.641 $\int \frac{x^5(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 705

$$\int \frac{x^5(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \frac{bcdx\sqrt{1-c^2x^2}}{8e^2(c^2d+e)(d+ex^2)} - \frac{d^2(a+b\arcsin(cx))}{4e^3(d+ex^2)^2} + \frac{d(a+b\arcsin(cx))}{e^3(d+ex^2)} - \frac{i(a+b\arcsin(cx))^2}{2be^3} - \frac{bc\sqrt{d}\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d+e}} + \frac{bc\sqrt{d}(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8e^3(c^2d+e)^{3/2}} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^3} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^3} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^3} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^3} - \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^3} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^3} - \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^3} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^3}$$

```
[Out] -1/4*d^2*(a+b*arcsin(c*x))/e^3/(e*x^2+d)^2+d*(a+b*arcsin(c*x))/e^3/(e*x^2+d
)-1/2*I*(a+b*arcsin(c*x))^2/b/e^3+1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x
^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^3+1/2*(a+b*arcsin(
c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/
2)))/e^3+1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c
*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^3+1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x
^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^3-1/2*I*b*polylog(
2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^3
-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*
```

```
d+e)^(1/2)))/e^3-1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c
*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^3-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/
2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^3+1/8*b*c*(2*c^2*d+e)*arcta
n(x*(c^2*d+e)^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))*d^(1/2)/e^3/(c^2*d+e)^(3/2)
-b*c*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))*d^(1/2)/e^3/(c^2*
d+e)^(1/2)+1/8*b*c*d*x*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d+e)/(e*x^2+d)
```

Rubi [A] (verified)

Time = 0.77 (sec) , antiderivative size = 705, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {4817, 4813, 390, 385, 211, 4825, 4617, 2221, 2317, 2438}

$$\int \frac{x^5(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^3} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^3} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^3} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2e^3} - \frac{d^2(a+b\arcsin(cx))}{4e^3(d+ex^2)^2} + \frac{d(a+b\arcsin(cx))}{e^3(d+ex^2)} - \frac{i(a+b\arcsin(cx))^2}{2be^3} - \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^3} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2e^3} - \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e^3} - \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2e^3} + \frac{bc\sqrt{d}(2c^2d+e)\arctan\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8e^3(c^2d+e)^{3/2}} - \frac{bc\sqrt{d}\arctan\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d+e}} + \frac{bcdx\sqrt{1-c^2x^2}}{8e^2(c^2d+e)(d+ex^2)}$$

```
[In] Int[(x^5*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (b*c*d*x*Sqrt[1 - c^2*x^2])/(8*e^2*(c^2*d + e)*(d + e*x^2)) - (d^2*(a + b*A
rcSin[c*x]))/(4*e^3*(d + e*x^2)^2) + (d*(a + b*ArcSin[c*x]))/(e^3*(d + e*x^
2)) - ((I/2)*(a + b*ArcSin[c*x])^2)/(b*e^3) - (b*c*Sqrt[d]*ArcTan[(Sqrt[c^2
*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(e^3*Sqrt[c^2*d + e]) + (b*c*Sqrt[
d]*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(
8*e^3*(c^2*d + e)^(3/2)) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e^3) + ((a + b*ArcSin[c*x])*
Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*e
^3) + ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d
] + Sqrt[c^2*d + e])])/(2*e^3) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I
*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*e^3) - ((I/2)*b*PolyLo
g[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/e^3
- ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*
d + e])])/e^3 - ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] + Sqrt[c^2*d + e]))])/e^3 - ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c
*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/e^3
```

<u>Rule 211</u>

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

<u>Rule 385</u>

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

<u>Rule 390</u>

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[(-b)*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^(q + 1)/(a*n*(p + 1)*(b*c -
 a*d))), x] + Dist[(b*c + n*(p + 1)*(b*c - a*d))/(a*n*(p + 1)*(b*c - a*d)),
 Int[(a + b*x^n)^(p + 1)*(c + d*x^n)^q, x], x] /; FreeQ[{a, b, c, d, n, q},
 x] && NeQ[b*c - a*d, 0] && EqQ[n*(p + q + 2) + 1, 0] && (LtQ[p, -1] ||  !L
tQ[q, -1]) && NeQ[p, -1]
```

<u>Rule 2221</u>

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

<u>Rule 2317</u>

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \int \left(\frac{d^2x(a+b\arcsin(cx))}{e^2\left(d+ex^2\right)^3}-\frac{2dx(a+b\arcsin(cx))}{e^2\left(d+ex^2\right)^2}+\frac{x(a+b\arcsin(cx))}{e^2\left(d+ex^2\right)}\right)dx\\ &= \frac{\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx}{e^2}-\frac{(2d)\int \frac{x(a+b\arcsin(cx))}{\left(d+ex^2\right)^2}\,dx}{e^2}+\frac{d^2\int \frac{x(a+b\arcsin(cx))}{\left(d+ex^2\right)^3}\,dx}{e^2}\end{aligned}$$

$$= -\frac{d^2(a+b\arcsin(cx))}{4e^3(d+ex^2)^2}+\frac{d(a+b\arcsin(cx))}{e^3(d+ex^2)}-\frac{(bcd)\int\frac{1}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{e^3}$$
$$+\frac{(bcd^2)\int\frac{1}{\sqrt{1-c^2x^2}(d+ex^2)^2}\,dx}{4e^3}+\frac{\int\left(-\frac{a+b\arcsin(cx)}{2\sqrt{e}(\sqrt{-d}-\sqrt{e}x)}+\frac{a+b\arcsin(cx)}{2\sqrt{e}(\sqrt{-d}+\sqrt{e}x)}\right)dx}{e^2}$$

$$= \frac{bcdx\sqrt{1-c^2x^2}}{8e^2(c^2d+e)(d+ex^2)}-\frac{d^2(a+b\arcsin(cx))}{4e^3(d+ex^2)^2}+\frac{d(a+b\arcsin(cx))}{e^3(d+ex^2)}$$
$$-\frac{(bcd)\text{Subst}\left(\int\frac{1}{d-(-c^2d-e)x^2}\,dx,x,\frac{x}{\sqrt{1-c^2x^2}}\right)}{e^3}-\frac{\int\frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2e^{5/2}}$$
$$+\frac{\int\frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2e^{5/2}}+\frac{(bcd(2c^2d+e))\int\frac{1}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{8e^3(c^2d+e)}$$

$$= \frac{bcdx\sqrt{1-c^2x^2}}{8e^2(c^2d+e)(d+ex^2)}-\frac{d^2(a+b\arcsin(cx))}{4e^3(d+ex^2)^2}+\frac{d(a+b\arcsin(cx))}{e^3(d+ex^2)}$$
$$-\frac{bc\sqrt{d}\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d+e}}-\frac{\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2e^{5/2}}$$
$$+\frac{\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2e^{5/2}}$$
$$+\frac{(bcd(2c^2d+e))\,\text{Subst}\left(\int\frac{1}{d-(-c^2d-e)x^2}\,dx,x,\frac{x}{\sqrt{1-c^2x^2}}\right)}{8e^3(c^2d+e)}$$

$$= \frac{bcdx\sqrt{1-c^2x^2}}{8e^2(c^2d+e)(d+ex^2)}-\frac{d^2(a+b\arcsin(cx))}{4e^3(d+ex^2)^2}$$
$$+\frac{d(a+b\arcsin(cx))}{e^3(d+ex^2)}-\frac{i(a+b\arcsin(cx))^2}{2be^3}$$
$$-\frac{bc\sqrt{d}\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d+e}}+\frac{bc\sqrt{d}(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8e^3(c^2d+e)^{3/2}}$$
$$-\frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2e^{5/2}}$$
$$-\frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2e^{5/2}}$$
$$+\frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2e^{5/2}}$$
$$+\frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2e^{5/2}}$$

$$= \frac{bcdx\sqrt{1-c^2x^2}}{8e^2\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{d^2(a+b\arcsin(cx))}{4e^3\left(d+ex^2\right)^2} + \frac{d(a+b\arcsin(cx))}{e^3\left(d+ex^2\right)}$$
$$- \frac{i(a+b\arcsin(cx))^2}{2be^3} - \frac{bc\sqrt{d}\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d+e}}$$
$$+ \frac{bc\sqrt{d}(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8e^3\left(c^2d+e\right)^{3/2}} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^3}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^3}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^3}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^3}$$
$$- \frac{b\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^3}$$
$$- \frac{b\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^3}$$
$$- \frac{b\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^3}$$
$$- \frac{b\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx, x, \arcsin(cx)\right)}{2e^3}$$

$$
\begin{aligned}
&= \frac{bcdx\sqrt{1-c^2x^2}}{8e^2\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{d^2(a+b\arcsin(cx))}{4e^3\left(d+ex^2\right)^2} + \frac{d(a+b\arcsin(cx))}{e^3\left(d+ex^2\right)} \\
&\quad - \frac{i(a+b\arcsin(cx))^2}{2be^3} - \frac{bc\sqrt{d}\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d+e}} \\
&\quad + \frac{bc\sqrt{d}(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8e^3\left(c^2d+e\right)^{3/2}} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^3} \\
&\quad + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^3} \\
&\quad + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^3} \\
&\quad + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^3} \\
&\quad + \frac{(ib)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^3} \\
&\quad + \frac{(ib)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^3} \\
&\quad + \frac{(ib)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^3} \\
&\quad + \frac{(ib)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx, x, e^{i\arcsin(cx)}\right)}{2e^3}
\end{aligned}
$$

$$= \frac{bcdx\sqrt{1-c^2x^2}}{8e^2(c^2d+e)(d+ex^2)} - \frac{d^2(a+b\arcsin(cx))}{4e^3(d+ex^2)^2} + \frac{d(a+b\arcsin(cx))}{e^3(d+ex^2)} - \frac{i(a+b\arcsin(cx))^2}{2be^3} - \frac{bc\sqrt{d}\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d+e}} + \frac{bc\sqrt{d}(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8e^3(c^2d+e)^{3/2}} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^3} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^3} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^3} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^3} - \frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^3} - \frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2e^3} - \frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^3} - \frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2e^3}$$

Mathematica [A] (verified)

Time = 5.02 (sec) , antiderivative size = 973, normalized size of antiderivative = 1.38

$$\int \frac{x^5(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx$$

$$= \frac{-\frac{4ad^2}{(d+ex^2)^2} + \frac{16ad}{d+ex^2} + 8a\log(d+ex^2) + b\left(\frac{cd\sqrt{e}\sqrt{1-c^2x^2}}{(c^2d+e)\left(-i\sqrt{d}+\sqrt{e}x\right)} + \frac{cd\sqrt{e}\sqrt{1-c^2x^2}}{(c^2d+e)\left(i\sqrt{d}+\sqrt{e}x\right)} + \frac{7\sqrt{d}\arcsin(cx)}{\sqrt{d}-i\sqrt{e}x} - \frac{d\arcsin(cx)}{\left(\sqrt{d}+i\sqrt{e}x\right)^2}\right.}{}$$

```
[In] Integrate[(x^5*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] ((-4*a*d^2)/(d + e*x^2)^2 + (16*a*d)/(d + e*x^2) + 8*a*Log[d + e*x^2] + b*(
(c*d*Sqrt[e]*Sqrt[1 - c^2*x^2])/((c^2*d + e)*((-I)*Sqrt[d] + Sqrt[e]*x)) +
(c*d*Sqrt[e]*Sqrt[1 - c^2*x^2])/((c^2*d + e)*(I*Sqrt[d] + Sqrt[e]*x)) + (7*
Sqrt[d]*ArcSin[c*x])/(Sqrt[d] - I*Sqrt[e]*x) - (d*ArcSin[c*x])/(Sqrt[d] + I
*Sqrt[e]*x)^2 + (7*Sqrt[d]*ArcSin[c*x])/(Sqrt[d] + I*Sqrt[e]*x) + (d*ArcSin
[c*x])/(I*Sqrt[d] + Sqrt[e]*x)^2 - (8*I)*ArcSin[c*x]^2 - (7*c*Sqrt[d]*ArcTa
n[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^
2*d + e] + ((7*I)*c*Sqrt[d]*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d
 + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e] + 8*ArcSin[c*x]*Log[1 + (Sqrt[e]
```

```
*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 8*ArcSin[c*x]*Log[1 +
(Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 8*ArcSin[c*
x]*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] + 8*A
rcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]
)] + (I*c^3*d^(3/2)*Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] - I*c^2*Sqrt[d]*x + Sqr
t[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d + I*Sqrt[d]*Sqrt[e]*x))])/(c^2*d +
 e)^(3/2) - (I*c^3*d^(3/2)*Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] + I*c^2*Sqrt[d]*
x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d - I*Sqrt[d]*Sqrt[e]*x))])/(
c^2*d + e)^(3/2) - (8*I)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
- Sqrt[c^2*d + e])] - (8*I)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqr
t[d]) + Sqrt[c^2*d + e])] - (8*I)*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/
(c*Sqrt[d] + Sqrt[c^2*d + e]))] - (8*I)*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x
]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]))/(16*e^3)
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 2.99 (sec) , antiderivative size = 3508, normalized size of antiderivative = 4.98

method	result	size
derivativedivides	Expression too large to display	3508
default	Expression too large to display	3508
parts	Expression too large to display	3513

```
[In] int(x^5*(a+b*arcsin(c*x))/(e*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^6*(a*c^6*(1/e^3*d*c^2/(c^2*e*x^2+c^2*d)-1/4*c^4*d^2/e^3/(c^2*e*x^2+c^2*
d)^2+1/2/e^3*ln(c^2*e*x^2+c^2*d))+b*c^6*(-1/2*I/e^3/(c^2*d+e)*c^2*d*sum((-_
R1^2*e+4*c^2*d+2*e)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2
*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e
*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*d^2*c^4
*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))
*arcsin(c*x)/e^5/(c^2*d+e)-1/4*I*(d*c^2*(c^2*d+e))^(1/2)/e/(c^2*d+e)^2/d/c^
2*arcsin(c*x)^2-1/2*I*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*polylog(2,e*(I*
c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*c^4*d^2/e^
5/(c^2*d+e)-1/2*I*(d*c^2*(c^2*d+e))^(1/2)/e^3/(c^2*d+e)^2*d*c^2*arcsin(c*x)
^2+1/4*(d*c^2*(c^2*d+e))^(1/2)/e/(c^2*d+e)^2/d/c^2*arcsin(c*x)*ln(1-e*(I*c*
x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))-1/4*(2*d^2*c
^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)*ln(
1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arc
sin(c*x)/c^2/d/e^2/(c^4*d^2+2*c^2*d*e+e^2)-1/8*I*(d*c^2*(c^2*d+e))^(1/2)/e/
(c^2*d+e)^2/d/c^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^
2*(c^2*d+e))^(1/2)+e))-2*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e
*d+(d*c^2*(c^2*d+e))^(1/2)*e)*c^2*d*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*
```

c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^4/(c^4*d^2+2*c^2*d*e+e^2)
-3/4*I*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*polylog(2,e*(I*c*x+(-c^2*x^2+1
)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*d*c^2/e^4/(c^2*d+e)-I*(2*
c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*arcsin(c*x)^2*c^4*d^2/e^5/(c^2*d+e)+2*I*
(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2
)*e)*c^2*d*arcsin(c*x)^2/e^4/(c^4*d^2+2*c^2*d*e+e^2)+1/8*I*(2*d^2*c^4+2*(d*
c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)*polylog(2,e
*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))/c^2/d/
e^2/(c^4*d^2+2*c^2*d*e+e^2)+I*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*
c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)*c^4*d^2*arcsin(c*x)^2/e^5/(c^4*d^2+2*c^2
*d*e+e^2)+1/2*I*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2
*(c^2*d+e))^(1/2)*e)*c^4*d^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^
2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^5/(c^4*d^2+2*c^2*d*e+e^2)+I*(2*d^2*c^4+
2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)*c^2*d*
polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)
+e))/e^4/(c^4*d^2+2*c^2*d*e+e^2)+1/4*I*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)
*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)*arcsin(c*x)^2/c^2/d/e^2/(c^4*d^
2+2*c^2*d*e+e^2)+3/2*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*c^2*d*ln(1-e*(I*
c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x
)/e^4/(c^2*d+e)-(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2
*(c^2*d+e))^(1/2)*e)*c^4*d^2*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2
*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^5/(c^4*d^2+2*c^2*d*e+e^2)-I/e^3/
(c^2*d+e)*c^2*d*arcsin(c*x)^2+1/8*d*c^2*(6*c^4*d^2*arcsin(c*x)+8*arcsin(c*x
)*c^4*d*e*x^2-I*c^4*d^2-2*I*c^4*d*e*x^2-I*e^2*c^4*x^4+(-c^2*x^2+1)^(1/2)*c^
3*d*e*x+(-c^2*x^2+1)^(1/2)*e^2*c^3*x^3+6*c^2*d*e*arcsin(c*x)+8*arcsin(c*x)*
e^2*c^2*x^2)/e^3/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2+1/2*I*arcsin(c*x)^2/e^3-1/2*
I/e^2/(c^2*d+e)*sum((-_R1^2*e+4*c^2*d+2*e)/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c
*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1
/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-I/e^2/(c^2*d+e)*arcsin
(c*x)^2-7/8*I*(d*c^2*(c^2*d+e))^(1/2)/e^2/(c^2*d+e)^2*arctanh(1/4*(4*c^2*d-
2*e*(I*c*x+(-c^2*x^2+1)^(1/2))^2+2*e)/(c^4*d^2+c^2*d*e)^(1/2))-5/4*(2*d^2*c
^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)*ln(
1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arc
sin(c*x)/e^3/(c^4*d^2+2*c^2*d*e+e^2)-3/8*I*(d*c^2*(c^2*d+e))^(1/2)/e^2/(c^2
*d+e)^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e
))^(1/2)+e))-1/2*I*arcsin(c*x)^2*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)/e^3/
(c^2*d+e)-3/4*I*(d*c^2*(c^2*d+e))^(1/2)/e^2/(c^2*d+e)^2*arcsin(c*x)^2+1/2*(
2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2
*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))*arcsin(c*x)/e^3/(c^2*d+e)+5/4*I*(2*d^2
c^4+2(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)*a
rcsin(c*x)^2/e^3/(c^4*d^2+2*c^2*d*e+e^2)+3/4*(d*c^2*(c^2*d+e))^(1/2)/e^2/(c
^2*d+e)^2*arcsin(c*x)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d*c^2
*(c^2*d+e))^(1/2)+e))+5/8*I*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^
2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(
2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))/e^3/(c^4*d^2+2*c^2*d*e+e^2)-1/4*I*pol

```
ylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)
)*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)/e^3/(c^2*d+e)-3/2*I*(2*c^2*d+2*(d*c
^2*(c^2*d+e))^(1/2)+e)*arcsin(c*x)^2*d*c^2/e^4/(c^2*d+e)+1/2*(d*c^2*(c^2*d+
e))^(1/2)/e^3/(c^2*d+e)^2*d*c^2*arcsin(c*x)*ln(1-e*(I*c*x+(-c^2*x^2+1)^(1/2
))^2/(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e))-1/4*I*(d*c^2*(c^2*d+e))^(1/2)/e
^3/(c^2*d+e)^2*d*c^2*polylog(2,e*(I*c*x+(-c^2*x^2+1)^(1/2))^2/(2*c^2*d+2*(d
*c^2*(c^2*d+e))^(1/2)+e))-3/4*I*(d*c^2*(c^2*d+e))^(1/2)/e^3/(c^2*d+e)^2*d*c
^2*arctanh(1/4*(4*c^2*d-2*e*(I*c*x+(-c^2*x^2+1)^(1/2))^2+2*e)/(c^4*d^2+c^2*
d*e)^(1/2)))
```

Fricas [F]

$$\int \frac{x^5(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{(b\arcsin(cx)+a)x^5}{(ex^2+d)^3}\,dx$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
[Out] integral((b*x^5*arcsin(c*x) + a*x^5)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 +
 d^3), x)
```

Sympy [F]

$$\int \frac{x^5(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{x^5(a+b\,\mathrm{asin}\,(cx))}{(d+ex^2)^3}\,dx$$

```
[In] integrate(x**5*(a+b*asin(c*x))/(e*x**2+d)**3,x)
[Out] Integral(x**5*(a + b*asin(c*x))/(d + e*x**2)**3, x)
```

Maxima [F]

$$\int \frac{x^5(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{(b\arcsin(cx)+a)x^5}{(ex^2+d)^3}\,dx$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
[Out] 1/4*a*((4*d*e*x^2 + 3*d^2)/(e^5*x^4 + 2*d*e^4*x^2 + d^2*e^3) + 2*log(e*x^2
+ d)/e^3) + b*integrate(x^5*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e^3
*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^3), x)
```

Giac [F]

$$\int \frac{x^5(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{(b\arcsin(cx)+a)x^5}{(ex^2+d)^3}\,dx$$

```
[In] integrate(x^5*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^5/(e*x^2 + d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^5(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{x^5\,(a+b\,\mathrm{asin}(c\,x))}{(e\,x^2+d)^3}\,dx$$

```
[In] int((x^5*(a + b*asin(c*x)))/(d + e*x^2)^3,x)
[Out] int((x^5*(a + b*asin(c*x)))/(d + e*x^2)^3, x)
```

3.642 $\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 153

$$\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = -\frac{bcx\sqrt{1-c^2x^2}}{8e(c^2d+e)(d+ex^2)} - \frac{b\arcsin(cx)}{4de^2} + \frac{x^4(a+b\arcsin(cx))}{4d(d+ex^2)^2} + \frac{bc(2c^2d+3e)\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8\sqrt{d}e^2(c^2d+e)^{3/2}}$$

```
[Out] -1/4*b*arcsin(c*x)/d/e^2+1/4*x^4*(a+b*arcsin(c*x))/d/(e*x^2+d)^2+1/8*b*c*(2
*c^2*d+3*e)*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))/e^2/(c^2*d
+e)^(3/2)/d^(1/2)-1/8*b*c*x*(-c^2*x^2+1)^(1/2)/e/(c^2*d+e)/(e*x^2+d)
```

Rubi [A] (verified)

Time = 0.14 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {270, 4815, 12, 481, 537, 222, 385, 211}

$$\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \frac{x^4(a+b\arcsin(cx))}{4d(d+ex^2)^2} - \frac{b\arcsin(cx)}{4de^2} + \frac{bc(2c^2d+3e)\arctan\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8\sqrt{d}e^2(c^2d+e)^{3/2}} - \frac{bcx\sqrt{1-c^2x^2}}{8e(c^2d+e)(d+ex^2)}$$

```
[In] Int[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] -1/8*(b*c*x*Sqrt[1 - c^2*x^2])/(e*(c^2*d + e)*(d + e*x^2)) - (b*ArcSin[c*x]
)/(4*d*e^2) + (x^4*(a + b*ArcSin[c*x]))/(4*d*(d + e*x^2)^2) + (b*c*(2*c^2*d
```

```
 + 3*e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(8*Sqrt[d]
*e^2*(c^2*d + e)^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 481

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Simp[(-a)*e^(2*n - 1)*(e*x)^(m - 2*n + 1)*(a + b*x^n)
^(p + 1)*((c + d*x^n)^(q + 1)/(b*n*(b*c - a*d)*(p + 1))), x] + Dist[e^(2*n)
/(b*n*(b*c - a*d)*(p + 1)), Int[(e*x)^(m - 2*n)*(a + b*x^n)^(p + 1)*(c + d*
x^n)^q*Simp[a*c*(m - 2*n + 1) + (a*d*(m - n + n*q + 1) + b*c*n*(p + 1))*x^n
, x], x], x] /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[b*c - a*d, 0] && IGtQ[n
, 0] && LtQ[p, -1] && GtQ[m - n + 1, n] && IntBinomialQ[a, b, c, d, e, m, n
, p, q, x]
```

Rule 537

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*Sqrt[(c_) + (d_.)*(x
_)^(n_)]), x_Symbol] :> Dist[f/b, Int[1/Sqrt[c + d*x^n], x], x] + Dist[(b*e
 - a*f)/b, Int[1/((a + b*x^n)*Sqrt[c + d*x^n]), x], x] /; FreeQ[{a, b, c, d
, e, f, n}, x]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x^4(a+b\arcsin(cx))}{4d\left(d+ex^2\right)^2}-(bc)\int\frac{x^4}{4d\sqrt{1-c^2x^2}\left(d+ex^2\right)^2}\,dx\\
&= \frac{x^4(a+b\arcsin(cx))}{4d\left(d+ex^2\right)^2}-\frac{(bc)\int\frac{x^4}{\sqrt{1-c^2x^2}(d+ex^2)^2}\,dx}{4d}\\
&= -\frac{bcx\sqrt{1-c^2x^2}}{8e\left(c^2d+e\right)\left(d+ex^2\right)}+\frac{x^4(a+b\arcsin(cx))}{4d\left(d+ex^2\right)^2}+\frac{(bc)\int\frac{d-2(c^2d+e)x^2}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{8de\left(c^2d+e\right)}\\
&= -\frac{bcx\sqrt{1-c^2x^2}}{8e\left(c^2d+e\right)\left(d+ex^2\right)}+\frac{x^4(a+b\arcsin(cx))}{4d\left(d+ex^2\right)^2}\\
&\quad-\frac{(bc)\int\frac{1}{\sqrt{1-c^2x^2}}\,dx}{4de^2}+\frac{\left(bc(2c^2d+3e)\right)\int\frac{1}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{8e^2\left(c^2d+e\right)}\\
&= -\frac{bcx\sqrt{1-c^2x^2}}{8e\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{b\arcsin(cx)}{4de^2}+\frac{x^4(a+b\arcsin(cx))}{4d\left(d+ex^2\right)^2}\\
&\quad+\frac{\left(bc(2c^2d+3e)\right)\operatorname{Subst}\left(\int\frac{1}{d-(-c^2d-e)x^2}\,dx,x,\frac{x}{\sqrt{1-c^2x^2}}\right)}{8e^2\left(c^2d+e\right)}\\
&= -\frac{bcx\sqrt{1-c^2x^2}}{8e\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{b\arcsin(cx)}{4de^2}\\
&\quad+\frac{x^4(a+b\arcsin(cx))}{4d\left(d+ex^2\right)^2}+\frac{bc(2c^2d+3e)\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8\sqrt{d}e^2\left(c^2d+e\right)^{3/2}}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 152, normalized size of antiderivative = 0.99

$$\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \frac{-\frac{\frac{bcex\sqrt{1-c^2x^2}(d+ex^2)}{c^2d+e}+2a(d+2ex^2)}{(d+ex^2)^2}-\frac{2b(d+2ex^2)\arcsin(cx)}{(d+ex^2)^2}+\frac{bc(2c^2d+3e)\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{\sqrt{d}(c^2d+e)^{3/2}}}{8e^2}$$

```
[In] Integrate[(x^3*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (-(((b*c*e*x*Sqrt[1 - c^2*x^2]*(d + e*x^2))/(c^2*d + e) + 2*a*(d + 2*e*x^2)
)/(d + e*x^2)^2) - (2*b*(d + 2*e*x^2)*ArcSin[c*x])/(d + e*x^2)^2 + (b*c*(2*
c^2*d + 3*e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(Sqrt
[d]*(c^2*d + e)^(3/2)))/(8*e^2)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1019 vs. 2(133) = 266.

Time = 0.18 (sec) , antiderivative size = 1020, normalized size of antiderivative = 6.67

method	result	size
parts	Expression too large to display	1020
derivativedivides	Expression too large to display	1038
default	Expression too large to display	1038

```
[In] int(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] a*(-1/2/e^2/(e*x^2+d)+1/4*d/e^2/(e*x^2+d)^2)+b/c^4*(1/4*c^8*arcsin(c*x)/e^2
*d/(c^2*e*x^2+c^2*d)^2-1/2*c^6*arcsin(c*x)/e^2/(c^2*e*x^2+c^2*d)+1/4*c^6/e^
2*(1/4/e*(-1/(c^2*d+e)*e/(c*x-(-c^2*e*d)^(1/2)/e)*(-(c*x-(-c^2*e*d)^(1/2)/e
)^2-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2)-(-c^2*
e*d)^(1/2)/(c^2*d+e)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e-2*(-c^2*e*d)^(1/
2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x-(-c^2*e*d)^(1/2)
/e)^2-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*
x-(-c^2*e*d)^(1/2)/e)))+1/4/e*(-1/(c^2*d+e)*e/(c*x+(-c^2*e*d)^(1/2)/e)*(-(c
*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+(c^2
*d+e)/e)^(1/2)+(-c^2*e*d)^(1/2)/(c^2*d+e)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+
e)/e+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-
(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+(c
^2*d+e)/e)^(1/2))/(c*x+(-c^2*e*d)^(1/2)/e)))+3/4/(-c^2*e*d)^(1/2)/((c^2*d+e
)/e)^(1/2)*ln((2*(c^2*d+e)/e+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+
2*((c^2*d+e)/e)^(1/2)*(-(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*
```

```
x+(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x+(-c^2*e*d)^(1/2)/e))-3/4/(-c
^2*e*d)^(1/2)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e-2*(-c^2*e*d)^(1/2)/e*(c
*x-(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x-(-c^2*e*d)^(1/2)/e)^2-2
*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x-(-c^2
*e*d)^(1/2)/e))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 442 vs. $2(133) = 266$.

Time = 0.39 (sec) , antiderivative size = 921, normalized size of antiderivative = 6.02

$$\int \frac{x^3(a + b\arcsin(cx))}{(d + ex^2)^3}\,dx$$

$$= \left[-\frac{8\,ac^4d^4 + 16\,ac^2d^3e + 8\,ad^2e^2 + 16\,(ac^4d^3e + 2\,ac^2d^2e^2 + ade^3)x^2 + (2\,bc^3d^3 + 3\,bcd^2e + (2\,bc^3de^2 + 3\,bc\right.$$

$$-\frac{4\,ac^4d^4 + 8\,ac^2d^3e + 4\,ad^2e^2 + 8\,(ac^4d^3e + 2\,ac^2d^2e^2 + ade^3)x^2 + (2\,bc^3d^3 + 3\,bcd^2e + (2\,bc^3de^2 + 3\,bce^3)}{}$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] [-1/32*(8*a*c^4*d^4 + 16*a*c^2*d^3*e + 8*a*d^2*e^2 + 16*(a*c^4*d^3*e + 2*a*
c^2*d^2*e^2 + a*d*e^3)*x^2 + (2*b*c^3*d^3 + 3*b*c*d^2*e + (2*b*c^3*d*e^2 +
3*b*c*e^3)*x^4 + 2*(2*b*c^3*d^2*e + 3*b*c*d*e^2)*x^2)*sqrt(-c^2*d^2 - d*e)*
log(((8*c^4*d^2 + 8*c^2*d*e + e^2)*x^4 - 2*(4*c^2*d^2 + 3*d*e)*x^2 - 4*sqrt
(-c^2*d^2 - d*e)*sqrt(-c^2*x^2 + 1)*((2*c^2*d + e)*x^3 - d*x) + d^2)/(e^2*x
^4 + 2*d*e*x^2 + d^2)) + 8*(b*c^4*d^4 + 2*b*c^2*d^3*e + b*d^2*e^2 + 2*(b*c^
4*d^3*e + 2*b*c^2*d^2*e^2 + b*d*e^3)*x^2)*arcsin(c*x) + 4*sqrt(-c^2*x^2 + 1
)*((b*c^3*d^2*e^2 + b*c*d*e^3)*x^3 + (b*c^3*d^3*e + b*c*d^2*e^2)*x))/(c^4*d
^5*e^2 + 2*c^2*d^4*e^3 + d^3*e^4 + (c^4*d^3*e^4 + 2*c^2*d^2*e^5 + d*e^6)*x^
4 + 2*(c^4*d^4*e^3 + 2*c^2*d^3*e^4 + d^2*e^5)*x^2), -1/16*(4*a*c^4*d^4 + 8*
a*c^2*d^3*e + 4*a*d^2*e^2 + 8*(a*c^4*d^3*e + 2*a*c^2*d^2*e^2 + a*d*e^3)*x^2
 + (2*b*c^3*d^3 + 3*b*c*d^2*e + (2*b*c^3*d*e^2 + 3*b*c*e^3)*x^4 + 2*(2*b*c^
3*d^2*e + 3*b*c*d*e^2)*x^2)*sqrt(c^2*d^2 + d*e)*arctan(1/2*sqrt(c^2*d^2 + d
*e)*sqrt(-c^2*x^2 + 1)*((2*c^2*d + e)*x^2 - d)/((c^4*d^2 + c^2*d*e)*x^3 - (
c^2*d^2 + d*e)*x)) + 4*(b*c^4*d^4 + 2*b*c^2*d^3*e + b*d^2*e^2 + 2*(b*c^4*d^
3*e + 2*b*c^2*d^2*e^2 + b*d*e^3)*x^2)*arcsin(c*x) + 2*sqrt(-c^2*x^2 + 1)*((
b*c^3*d^2*e^2 + b*c*d*e^3)*x^3 + (b*c^3*d^3*e + b*c*d^2*e^2)*x))/(c^4*d^5*e
^2 + 2*c^2*d^4*e^3 + d^3*e^4 + (c^4*d^3*e^4 + 2*c^2*d^2*e^5 + d*e^6)*x^4 +
2*(c^4*d^4*e^3 + 2*c^2*d^3*e^4 + d^2*e^5)*x^2)]
```

Sympy [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{x^3(a+b\,\mathrm{asin}\,(cx))}{(d+ex^2)^3}\,dx$$

```
[In] integrate(x**3*(a+b*asin(c*x))/(e*x**2+d)**3,x)
[Out] Integral(x**3*(a + b*asin(c*x))/(d + e*x**2)**3, x)
```

Maxima [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{(b\arcsin(cx)+a)x^3}{(ex^2+d)^3}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
[Out] -1/4*(2*e*x^2 + d)*a/(e^4*x^4 + 2*d*e^3*x^2 + d^2*e^2) - 1/4*((2*e*x^2 + d)
*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 4*(e^4*x^4 + 2*d*e^3*x^2 + d^
2*e^2)*integrate(1/4*(2*c*e*x^2 + c*d)*e^(1/2*log(c*x + 1) + 1/2*log(-c*x +
 1))/(c^4*e^4*x^8 - c^2*d^2*e^2*x^2 + (2*c^4*d*e^3 - c^2*e^4)*x^6 + (c^4*d^
2*e^2 - 2*c^2*d*e^3)*x^4 + (c^2*e^4*x^6 + (2*c^2*d*e^3 - e^4)*x^4 - d^2*e^2
 + (c^2*d^2*e^2 - 2*d*e^3)*x^2)*e^(log(c*x + 1) + log(-c*x + 1))), x))*b/(e
^4*x^4 + 2*d*e^3*x^2 + d^2*e^2)
```

Giac [F]

$$\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{(b\arcsin(cx)+a)x^3}{(ex^2+d)^3}\,dx$$

```
[In] integrate(x^3*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^3/(e*x^2 + d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^3(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{x^3\,(a+b\,\mathrm{asin}(c\,x))}{(e\,x^2+d)^3}\,dx$$

```
[In] int((x^3*(a + b*asin(c*x)))/(d + e*x^2)^3,x)
[Out] int((x^3*(a + b*asin(c*x)))/(d + e*x^2)^3, x)
```

3.643 $\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^3} dx$

Optimal result

Integrand size = 19, antiderivative size = 133

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^3} dx = \frac{bcx\sqrt{1-c^2x^2}}{8d(c^2d+e)(d+ex^2)} - \frac{a+b\arcsin(cx)}{4e(d+ex^2)^2} + \frac{bc(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{3/2}e(c^2d+e)^{3/2}}$$

```
[Out] 1/4*(-a-b*arcsin(c*x))/e/(e*x^2+d)^2+1/8*b*c*(2*c^2*d+e)*arctan(x*(c^2*d+e)
^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))/d^(3/2)/e/(c^2*d+e)^(3/2)+1/8*b*c*x*(-c^
2*x^2+1)^(1/2)/d/(c^2*d+e)/(e*x^2+d)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.211, Rules used = {4813, 390, 385, 211}

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^3} dx = -\frac{a+b\arcsin(cx)}{4e(d+ex^2)^2} + \frac{bc(2c^2d+e)\arctan\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{3/2}e(c^2d+e)^{3/2}} + \frac{bcx\sqrt{1-c^2x^2}}{8d(c^2d+e)(d+ex^2)}$$

```
[In] Int[(x*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (b*c*x*Sqrt[1 - c^2*x^2])/(8*d*(c^2*d + e)*(d + e*x^2)) - (a + b*ArcSin[c*x
])/(4*e*(d + e*x^2)^2) + (b*c*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqr
t[d]*Sqrt[1 - c^2*x^2])])/(8*d^(3/2)*e*(c^2*d + e)^(3/2))
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 390

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[(-b)*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^(q + 1)/(a*n*(p + 1)*(b*c -
 a*d))), x] + Dist[(b*c + n*(p + 1)*(b*c - a*d))/(a*n*(p + 1)*(b*c - a*d)),
 Int[(a + b*x^n)^(p + 1)*(c + d*x^n)^q, x], x] /; FreeQ[{a, b, c, d, n, q},
 x] && NeQ[b*c - a*d, 0] && EqQ[n*(p + q + 2) + 1, 0] && (LtQ[p, -1] ||  !L
tQ[q, -1]) && NeQ[p, -1]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= -\frac{a+b\arcsin(cx)}{4e\left(d+ex^2\right)^2}+\frac{(bc)\int\frac{1}{\sqrt{1-c^2x^2}(d+ex^2)^2}\,dx}{4e} \\
&= \frac{bcx\sqrt{1-c^2x^2}}{8d\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{a+b\arcsin(cx)}{4e\left(d+ex^2\right)^2}+\frac{(bc(2c^2d+e))\int\frac{1}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{8de\left(c^2d+e\right)} \\
&= \frac{bcx\sqrt{1-c^2x^2}}{8d\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{a+b\arcsin(cx)}{4e\left(d+ex^2\right)^2} \\
&\quad+\frac{(bc(2c^2d+e))\operatorname{Subst}\left(\int\frac{1}{d-(-c^2d-e)x^2}\,dx,x,\frac{x}{\sqrt{1-c^2x^2}}\right)}{8de\left(c^2d+e\right)} \\
&= \frac{bcx\sqrt{1-c^2x^2}}{8d\left(c^2d+e\right)\left(d+ex^2\right)}-\frac{a+b\arcsin(cx)}{4e\left(d+ex^2\right)^2}+\frac{bc(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{3/2}e\left(c^2d+e\right)^{3/2}}
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.06

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \frac{1}{8}\left(\frac{-\frac{2a}{e}+\frac{bcx\sqrt{1-c^2x^2}(d+ex^2)}{d(c^2d+e)}}{(d+ex^2)^2}-\frac{2b\arcsin(cx)}{e\,(d+ex^2)^2}+\frac{bc(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{d^{3/2}e\,(c^2d+e)^{3/2}}\right)$$

```
[In] Integrate[(x*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (((-2*a)/e + (b*c*x*Sqrt[1 - c^2*x^2]*(d + e*x^2))/(d*(c^2*d + e)))/(d + e*
x^2)^2 - (2*b*ArcSin[c*x])/(e*(d + e*x^2)^2) + (b*c*(2*c^2*d + e)*ArcTan[(S
qrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(d^(3/2)*e*(c^2*d + e)^(3/2
)))/8
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 997 vs. 2(118) = 236.

Time = 0.21 (sec) , antiderivative size = 998, normalized size of antiderivative = 7.50

method	result
parts	$-\frac{a}{4e(e\,x^2+d)^2}+\frac{b\left(-\frac{c^6\arcsin(cx)}{4e\left(c^2e\,x^2+c^2d\right)^2}+\frac{c^6\left(-\frac{-\frac{e\sqrt{-\left(cx-\frac{\sqrt{-c^2ed}}{e}\right)^2-\frac{2\sqrt{-c^2ed}\left(cx-\frac{\sqrt{-c^2ed}}{e}\right)}{e}+\frac{c^2d+e}{e}}}{\left(c^2d+e\right)\left(cx-\frac{\sqrt{-c^2ed}}{e}\right)}-\frac{\sqrt{-c^2ed}\,\ln\left(\cdots\right.}{\cdots}}{\cdots}\cdots\right.}{\cdots}\cdots\right.}{\cdots}$
derivativedivides	Expression too large to display
default	Expression too large to display

[In] int(x*(a+b*arcsin(c*x))/(e*x^2+d)^3,x,method=_RETURNVERBOSE)

[Out] -1/4*a/e/(e*x^2+d)^2+b/c^2*(-1/4*c^6/e/(c^2*e*x^2+c^2*d)^2*arcsin(c*x)+1/4*
c^6/e*(-1/4/d/c^2/e*(-1/(c^2*d+e)*e/(c*x-(-c^2*e*d)^(1/2)/e)*(-(c*x-(-c^2*e
d)^(1/2)/e)^2-2(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(
1/2)-(-c^2*e*d)^(1/2)/(c^2*d+e)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e-2*(-c
^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x-(-c^2
*e*d)^(1/2)/e)^2-2*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)
^(1/2))/(c*x-(-c^2*e*d)^(1/2)/e)))-1/4/d/c^2/e*(-1/(c^2*d+e)*e/(c*x+(-c^2*e
d)^(1/2)/e)(-(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e
*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2)+(-c^2*e*d)^(1/2)/(c^2*d+e)/((c^2*d+e)/e)^(1
/2)*ln((2*(c^2*d+e)/e+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+2*((c^2
d+e)/e)^(1/2)(-(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2
*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x+(-c^2*e*d)^(1/2)/e)))-1/4/d/c^2/(-c
^2*e*d)^(1/2)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d+e)/e-2*(-c^2*e*d)^(1/2)/e*(c
*x-(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(-(c*x-(-c^2*e*d)^(1/2)/e)^2-2
*(-c^2*e*d)^(1/2)/e*(c*x-(-c^2*e*d)^(1/2)/e)+(c^2*d+e)/e)^(1/2))/(c*x-(-c^2
*e*d)^(1/2)/e))+1/4/d/c^2/(-c^2*e*d)^(1/2)/((c^2*d+e)/e)^(1/2)*ln((2*(c^2*d
+e)/e+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+2*((c^2*d+e)/e)^(1/2)*(
-(c*x+(-c^2*e*d)^(1/2)/e)^2+2*(-c^2*e*d)^(1/2)/e*(c*x+(-c^2*e*d)^(1/2)/e)+(
c^2*d+e)/e)^(1/2))/(c*x+(-c^2*e*d)^(1/2)/e))))

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 373 vs. 2(115) = 230.

Time = 0.37 (sec) , antiderivative size = 783, normalized size of antiderivative = 5.89

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx$$
$$= \left[-\frac{8\,ac^4d^4+16\,ac^2d^3e+8\,ad^2e^2+(2\,bc^3d^3+bcd^2e+(2\,bc^3de^2+bce^3)x^4+2\,(2\,bc^3d^2e+bcde^2)x^2)\sqrt{-c^2d^2}}{32\,(c^4d}\right.$$
$$-\frac{4\,ac^4d^4+8\,ac^2d^3e+4\,ad^2e^2+(2\,bc^3d^3+bcd^2e+(2\,bc^3de^2+bce^3)x^4+2\,(2\,bc^3d^2e+bcde^2)x^2)\sqrt{c^2d^2+d}}{16\,(c^4d^6e+2\,c^2d^5e^2+d^4e^3}$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] [-1/32*(8*a*c^4*d^4 + 16*a*c^2*d^3*e + 8*a*d^2*e^2 + (2*b*c^3*d^3 + b*c*d^2
*e + (2*b*c^3*d*e^2 + b*c*e^3)*x^4 + 2*(2*b*c^3*d^2*e + b*c*d*e^2)*x^2)*sqr
t(-c^2*d^2 - d*e)*log(((8*c^4*d^2 + 8*c^2*d*e + e^2)*x^4 - 2*(4*c^2*d^2 + 3
*d*e)*x^2 - 4*sqrt(-c^2*d^2 - d*e)*sqrt(-c^2*x^2 + 1)*((2*c^2*d + e)*x^3 -
d*x) + d^2)/(e^2*x^4 + 2*d*e*x^2 + d^2)) + 8*(b*c^4*d^4 + 2*b*c^2*d^3*e + b
*d^2*e^2)*arcsin(c*x) - 4*sqrt(-c^2*x^2 + 1)*((b*c^3*d^2*e^2 + b*c*d*e^3)*x
^3 + (b*c^3*d^3*e + b*c*d^2*e^2)*x))/(c^4*d^6*e + 2*c^2*d^5*e^2 + d^4*e^3 +
 (c^4*d^4*e^3 + 2*c^2*d^3*e^4 + d^2*e^5)*x^4 + 2*(c^4*d^5*e^2 + 2*c^2*d^4*e
^3 + d^3*e^4)*x^2), -1/16*(4*a*c^4*d^4 + 8*a*c^2*d^3*e + 4*a*d^2*e^2 + (2*b
*c^3*d^3 + b*c*d^2*e + (2*b*c^3*d*e^2 + b*c*e^3)*x^4 + 2*(2*b*c^3*d^2*e + b
*c*d*e^2)*x^2)*sqrt(c^2*d^2 + d*e)*arctan(1/2*sqrt(c^2*d^2 + d*e)*sqrt(-c^2
*x^2 + 1)*((2*c^2*d + e)*x^2 - d)/((c^4*d^2 + c^2*d*e)*x^3 - (c^2*d^2 + d*e
)*x)) + 4*(b*c^4*d^4 + 2*b*c^2*d^3*e + b*d^2*e^2)*arcsin(c*x) - 2*sqrt(-c^2
*x^2 + 1)*((b*c^3*d^2*e^2 + b*c*d*e^3)*x^3 + (b*c^3*d^3*e + b*c*d^2*e^2)*x)
)/(c^4*d^6*e + 2*c^2*d^5*e^2 + d^4*e^3 + (c^4*d^4*e^3 + 2*c^2*d^3*e^4 + d^2
*e^5)*x^4 + 2*(c^4*d^5*e^2 + 2*c^2*d^4*e^3 + d^3*e^4)*x^2)]
```

Sympy [F]

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{x(a+b\operatorname{asin}(cx))}{(d+ex^2)^3}\,dx$$

```
[In] integrate(x*(a+b*asin(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Integral(x*(a + b*asin(c*x))/(d + e*x**2)**3, x)
```

Maxima [F]

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{(b\arcsin(cx)+a)x}{(ex^2+d)^3}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*(4*(c*e^3*x^4 + 2*c*d*e^2*x^2 + c*d^2*e)*integrate(1/4*e^(1/2*log(c*x
+ 1) + 1/2*log(-c*x + 1))/(c^4*e^3*x^8 - c^2*d^2*e*x^2 + (2*c^4*d*e^2 - c^2
*e^3)*x^6 + (c^4*d^2*e - 2*c^2*d*e^2)*x^4 + (c^2*e^3*x^6 + (2*c^2*d*e^2 - e
^3)*x^4 - d^2*e + (c^2*d^2*e - 2*d*e^2)*x^2)*e^(log(c*x + 1) + log(-c*x + 1
))), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*b/(e^3*x^4 + 2*d*e^2*
x^2 + d^2*e) - 1/4*a/(e^3*x^4 + 2*d*e^2*x^2 + d^2*e)
```

Giac [F]

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{(b\arcsin(cx)+a)x}{(ex^2+d)^3}\,dx$$

```
[In] integrate(x*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x/(e*x^2 + d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{x\,(a+b\,\mathrm{asin}(c\,x))}{(e\,x^2+d)^3}\,dx$$

```
[In] int((x*(a + b*asin(c*x)))/(d + e*x^2)^3,x)
```

```
[Out] int((x*(a + b*asin(c*x)))/(d + e*x^2)^3, x)
```

3.644 $\int \frac{a+b \arcsin(cx)}{x(d+ex^2)^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 727

$$
\begin{aligned}
\int \frac{a+b\arcsin(cx)}{x(d+ex^2)^3}\,dx =& -\frac{bcex\sqrt{1-c^2x^2}}{8d^2(c^2d+e)(d+ex^2)} + \frac{a+b\arcsin(cx)}{4d(d+ex^2)^2} + \frac{a+b\arcsin(cx)}{2d^2(d+ex^2)} \\
& - \frac{bc\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} - \frac{bc(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{5/2}(c^2d+e)^{3/2}} \\
& - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^3} \\
& - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^3} \\
& - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^3} \\
& - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^3} \\
& + \frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^3} \\
& + \frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^3} \\
& + \frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^3} + \frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^3} \\
& + \frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^3} - \frac{ib\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^3}
\end{aligned}
$$

```
[Out] 1/4*(a+b*arcsin(c*x))/d/(e*x^2+d)^2+1/2*(a+b*arcsin(c*x))/d^2/(e*x^2+d)-1/8
*b*c*(2*c^2*d+e)*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))/d^(5/
2)/(c^2*d+e)^(3/2)+(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^3
-1/2*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1
/2)-(c^2*d+e)^(1/2)))/d^3-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1
/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^3-1/2*(a+b*arcsin(c*x))*ln
(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^3
-1/2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1
/2)+(c^2*d+e)^(1/2)))/d^3-1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d
^3+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c
^2*d+e)^(1/2)))/d^3+1/2*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I
*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^3+1/2*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^
(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^3+1/2*I*b*polylog(2,(I*c
*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^3-1/2*b*
c*arctan(x*(c^2*d+e)^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))/d^(5/2)/(c^2*d+e)^(1
/2)-1/8*b*c*e*x*(-c^2*x^2+1)^(1/2)/d^2/(c^2*d+e)/(e*x^2+d)
```

Rubi [A] (verified)

Time = 0.79 (sec) , antiderivative size = 727, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.571$, Rules

used = {4817, 4721, 3798, 2221, 2317, 2438, 4813, 390, 385, 211, 4825, 4617}

$$\int \frac{a+b\arcsin(cx)}{x\left(d+ex^2\right)^3}\,dx = -\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^3} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^3} - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^3} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^3} + \frac{\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^3} + \frac{a+b\arcsin(cx)}{2d^2\left(d+ex^2\right)} + \frac{a+b\arcsin(cx)}{4d\left(d+ex^2\right)^2} + \frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d^3} + \frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d^3} + \frac{ib\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2d^3} + \frac{ib\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2d^3} - \frac{ib\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^3} - \frac{bc(2c^2d+e)\arctan\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{5/2}\left(c^2d+e\right)^{3/2}} - \frac{bc\arctan\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} - \frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^3),x]
```

```
[Out] -1/8*(b*c*e*x*Sqrt[1 - c^2*x^2])/(d^2*(c^2*d + e)*(d + e*x^2)) + (a + b*Arc
Sin[c*x])/(4*d*(d + e*x^2)^2) + (a + b*ArcSin[c*x])/(2*d^2*(d + e*x^2)) - (
b*c*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(2*d^(5/2)*Sqr
t[c^2*d + e]) - (b*c*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt
[1 - c^2*x^2])])/(8*d^(5/2)*(c^2*d + e)^(3/2)) - ((a + b*ArcSin[c*x])*Log[1
 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d^3) -
 ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - S
qrt[c^2*d + e])])/(2*d^3) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcS
in[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^3) - ((a + b*ArcSin[c*x])
*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*
d^3) + ((a + b*ArcSin[c*x])*Log[1 - E^((2*I)*ArcSin[c*x])])/d^3 + ((I/2)*b*
PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))]
)/d^3 + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqr
t[c^2*d + e])])/d^3 + ((I/2)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*
```

```
c*Sqrt[-d] + Sqrt[c^2*d + e]))])/d^3 + ((I/2)*b*PolyLog[2, (Sqrt[e]*E^(I*Ar
cSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/d^3 - ((I/2)*b*PolyLog[2, E^
((2*I)*ArcSin[c*x])])/d^3
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 390

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[(-b)*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^(q + 1)/(a*n*(p + 1)*(b*c -
 a*d))), x] + Dist[(b*c + n*(p + 1)*(b*c - a*d))/(a*n*(p + 1)*(b*c - a*d)),
 Int[(a + b*x^n)^(p + 1)*(c + d*x^n)^q, x], x] /; FreeQ[{a, b, c, d, n, q},
 x] && NeQ[b*c - a*d, 0] && EqQ[n*(p + q + 2) + 1, 0] && (LtQ[p, -1] ||  !L
tQ[q, -1]) && NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
```

```
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a+b\arcsin(cx)}{d^3x} - \frac{ex(a+b\arcsin(cx))}{d\,(d+ex^2)^3} - \frac{ex(a+b\arcsin(cx))}{d^2\,(d+ex^2)^2} - \frac{ex(a+b\arcsin(cx))}{d^3\,(d+ex^2)}\right) dx$$

$$= \frac{\int \frac{a+b\arcsin(cx)}{x}\,dx}{d^3} - \frac{e\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx}{d^3} - \frac{e\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx}{d^2} - \frac{e\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx}{d}$$

$$= \frac{a+b\arcsin(cx)}{4d\left(d+ex^2\right)^2}+\frac{a+b\arcsin(cx)}{2d^2\left(d+ex^2\right)}+\frac{\text{Subst}\left(\int(a+bx)\cot(x)\,dx,x,\arcsin(cx)\right)}{d^3}-\frac{(bc)\int\frac{1}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{2d^2}-\frac{(bc)\int\frac{1}{\sqrt{1-c^2x^2}(d+ex^2)^2}\,dx}{4d}-\frac{e\int\left(-\frac{a+b\arcsin(cx)}{2\sqrt{e}(\sqrt{-d}-\sqrt{e}x)}+\frac{a+b\arcsin(cx)}{2\sqrt{e}(\sqrt{-d}+\sqrt{e}x)}\right)dx}{d^3}$$

$$= -\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)}+\frac{a+b\arcsin(cx)}{4d\left(d+ex^2\right)^2}+\frac{a+b\arcsin(cx)}{2d^2\left(d+ex^2\right)}-\frac{i(a+b\arcsin(cx))^2}{2bd^3}-\frac{(2i)\text{Subst}\left(\int\frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx,x,\arcsin(cx)\right)}{d^3}-\frac{(bc)\text{Subst}\left(\int\frac{1}{d-(-c^2d-e)x^2}\,dx,x,\frac{x}{\sqrt{1-c^2x^2}}\right)}{2d^2}+\frac{\sqrt{e}\int\frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2d^3}-\frac{\sqrt{e}\int\frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2d^3}-\frac{(bc(2c^2d+e))\int\frac{1}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{8d^2\left(c^2d+e\right)}$$

$$= -\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)}+\frac{a+b\arcsin(cx)}{4d\left(d+ex^2\right)^2}+\frac{a+b\arcsin(cx)}{2d^2\left(d+ex^2\right)}-\frac{i(a+b\arcsin(cx))^2}{2bd^3}-\frac{bc\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}}+\frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^3}-\frac{b\text{Subst}\left(\int\log\left(1-e^{2ix}\right)\,dx,x,\arcsin(cx)\right)}{d^3}+\frac{\sqrt{e}\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2d^3}-\frac{\sqrt{e}\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2d^3}-\frac{(bc(2c^2d+e))\,\text{Subst}\left(\int\frac{1}{d-(-c^2d-e)x^2}\,dx,x,\frac{x}{\sqrt{1-c^2x^2}}\right)}{8d^2\left(c^2d+e\right)}$$

$$= -\frac{bcex\sqrt{1-c^2x^2}}{8d^2(c^2d+e)(d+ex^2)} + \frac{a+b\arcsin(cx)}{4d(d+ex^2)^2} + \frac{a+b\arcsin(cx)}{2d^2(d+ex^2)}$$
$$- \frac{bc\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} - \frac{bc(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{5/2}(c^2d+e)^{3/2}}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^3} + \frac{(ib)\text{Subst}\left(\int \frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2d^3}$$
$$+ \frac{(i\sqrt{e})\,\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2d^3}$$
$$+ \frac{(i\sqrt{e})\,\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2d^3}$$
$$- \frac{(i\sqrt{e})\,\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2d^3}$$
$$- \frac{(i\sqrt{e})\,\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2d^3}$$

$$= -\frac{bcex\sqrt{1-c^2x^2}}{8d^2\left(c^2d+e\right)\left(d+ex^2\right)} + \frac{a+b\arcsin(cx)}{4d\left(d+ex^2\right)^2} + \frac{a+b\arcsin(cx)}{2d^2\left(d+ex^2\right)}$$
$$- \frac{bc\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} - \frac{bc(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{5/2}\left(c^2d+e\right)^{3/2}}$$
$$- \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^3}$$
$$- \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^3}$$
$$- \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^3}$$
$$- \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^3}$$
$$+ \frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^3} - \frac{ib\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^3}$$
$$+ \frac{b\mathrm{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2d^3}$$
$$+ \frac{b\mathrm{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2d^3}$$
$$+ \frac{b\mathrm{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2d^3}$$
$$+ \frac{b\mathrm{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{2d^3}$$

$$
\begin{aligned}
&= -\frac{bcex\sqrt{1-c^2x^2}}{8d^2(c^2d+e)(d+ex^2)} + \frac{a+b\arcsin(cx)}{4d(d+ex^2)^2} + \frac{a+b\arcsin(cx)}{2d^2(d+ex^2)} \\
&- \frac{bc\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} - \frac{bc(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{5/2}(c^2d+e)^{3/2}} \\
&- \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^3} \\
&- \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^3} \\
&- \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^3} \\
&- \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^3} \\
&+ \frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^3} - \frac{ib\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^3} \\
&- \frac{(ib)\mathrm{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2d^3} \\
&- \frac{(ib)\mathrm{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2d^3} \\
&- \frac{(ib)\mathrm{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2d^3} \\
&- \frac{(ib)\mathrm{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2d^3}
\end{aligned}
$$

$$= -\frac{bcex\sqrt{1-c^2x^2}}{8d^2(c^2d+e)(d+ex^2)} + \frac{a+b\arcsin(cx)}{4d(d+ex^2)^2} + \frac{a+b\arcsin(cx)}{2d^2(d+ex^2)} - \frac{bc\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{2d^{5/2}\sqrt{c^2d+e}} - \frac{bc(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{5/2}(c^2d+e)^{3/2}} - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^3} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^3} - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^3} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^3} + \frac{(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^3} + \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^3} + \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^3} + \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^3} + \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^3} - \frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^3}$$

Mathematica [A] (verified)

Time = 3.89 (sec) , antiderivative size = 1022, normalized size of antiderivative = 1.41

$$\int \frac{a+b\arcsin(cx)}{x(d+ex^2)^3}\,dx$$

$$= \frac{-\frac{bcd\sqrt{e}\sqrt{1-c^2x^2}}{(c^2d+e)\left(-i\sqrt{d}+\sqrt{e}x\right)} - \frac{bcd\sqrt{e}\sqrt{1-c^2x^2}}{(c^2d+e)\left(i\sqrt{d}+\sqrt{e}x\right)} + \frac{4ad^2}{(d+ex^2)^2} + \frac{8ad}{d+ex^2} + \frac{bd\arcsin(cx)}{\left(\sqrt{d}-i\sqrt{e}x\right)^2} + \frac{5b\sqrt{d}\arcsin(cx)}{\sqrt{d}-i\sqrt{e}x} + \frac{bd\arcsin(cx)}{\left(\sqrt{d}+i\sqrt{e}x\right)^2} + \frac{5b\sqrt{}}{\sqrt{}}}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x*(d + e*x^2)^3),x]
```

```
[Out] (-((b*c*d*Sqrt[e]*Sqrt[1 - c^2*x^2])/((c^2*d + e)*((-I)*Sqrt[d] + Sqrt[e]*x
))) - (b*c*d*Sqrt[e]*Sqrt[1 - c^2*x^2])/((c^2*d + e)*(I*Sqrt[d] + Sqrt[e]*x
)) + (4*a*d^2)/(d + e*x^2)^2 + (8*a*d)/(d + e*x^2) + (b*d*ArcSin[c*x])/(Sqr
t[d] - I*Sqrt[e]*x)^2 + (5*b*Sqrt[d]*ArcSin[c*x])/(Sqrt[d] - I*Sqrt[e]*x) +
 (b*d*ArcSin[c*x])/(Sqrt[d] + I*Sqrt[e]*x)^2 + (5*b*Sqrt[d]*ArcSin[c*x])/(S
qrt[d] + I*Sqrt[e]*x) - (5*b*c*Sqrt[d]*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(
Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e] + ((5*I)*b*c*Sqrt[d]*A
rcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sq
```

```
rt[c^2*d + e] - 8*b*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt
[d] - Sqrt[c^2*d + e])] - 8*b*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]
))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] - 8*b*ArcSin[c*x]*Log[1 - (Sqrt[e]*E^(
I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] - 8*b*ArcSin[c*x]*Log[1 + (S
qrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] + 16*b*ArcSin[c*x]
*Log[1 - E^((2*I)*ArcSin[c*x])] + 16*a*Log[x] - 8*a*Log[d + e*x^2] - (I*b*c
^3*d^(3/2)*Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] - I*c^2*Sqrt[d]*x + Sqrt[c^2*d +
 e]*Sqrt[1 - c^2*x^2]))/(c^3*(d + I*Sqrt[d]*Sqrt[e]*x))])/(c^2*d + e)^(3/2)
 + (I*b*c^3*d^(3/2)*Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] + I*c^2*Sqrt[d]*x + Sqr
t[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d - I*Sqrt[d]*Sqrt[e]*x))])/(c^2*d +
 e)^(3/2) + (8*I)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqr
t[c^2*d + e])] + (8*I)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d
]) + Sqrt[c^2*d + e])] + (8*I)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(
c*Sqrt[d] + Sqrt[c^2*d + e]))] + (8*I)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*
x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] - (8*I)*b*PolyLog[2, E^((2*I)*ArcSin[c*
x])])/(16*d^3)
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 2.10 (sec) , antiderivative size = 1130, normalized size of antiderivative = 1.55

method	result	size
parts	Expression too large to display	1130
derivativedivides	Expression too large to display	1174
default	Expression too large to display	1174

```
[In] int((a+b*arcsin(c*x))/x/(e*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] a/d^3*ln(x)+1/2*a/d^2/(e*x^2+d)-1/2*a/d^3*ln(e*x^2+d)+1/4*a/d/(e*x^2+d)^2+b
*(1/8*c^2*(6*c^4*d^2*arcsin(c*x)+4*arcsin(c*x)*c^4*d*e*x^2+I*c^4*d^2+2*I*c^
4*d*e*x^2+I*e^2*c^4*x^4-(-c^2*x^2+1)^(1/2)*c^3*d*e*x-(-c^2*x^2+1)^(1/2)*e^2
*c^3*x^3+6*c^2*d*e*arcsin(c*x)+4*arcsin(c*x)*e^2*c^2*x^2)/d^2/(c^2*e*x^2+c^
2*d)^2/(c^2*d+e)+1/4*I/(c^2*d+e)*c^2/d^2*e*sum((_R1^2-1)/(_R1^2*e-2*c^2*d-e
)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-
c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+I/(c^2*d+
e)*c^2/d^2*dilog(I*c*x+(-c^2*x^2+1)^(1/2))-I/(c^2*d+e)*c^2/d^2*dilog(1+I*c*
x+(-c^2*x^2+1)^(1/2))+1/(c^2*d+e)*c^2/d^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+
1)^(1/2))+1/4*I/(c^2*d+e)/d^3*e^2*sum((_R1^2-1)/(_R1^2*e-2*c^2*d-e)*(I*arcs
in(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1
)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+3/4*I*(d*c^2*(c^2*
d+e))^(1/2)/(c^2*d+e)^2/d^2*c^2*arctanh(1/4*(2*e*(I*c*x+(-c^2*x^2+1)^(1/2))
^2-4*c^2*d-2*e)/(c^4*d^2+c^2*d*e)^(1/2))+I/(c^2*d+e)/d^3*e*dilog(I*c*x+(-c^
2*x^2+1)^(1/2))-I/(c^2*d+e)/d^3*e*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))+5/8*I*(
```

```
d*c^2*(c^2*d+e))^(1/2)/(c^2*d+e)^2/d^3*arctanh(1/4*(2*e*(I*c*x+(-c^2*x^2+1)
^(1/2))^2-4*c^2*d-2*e)/(c^4*d^2+c^2*d*e)^(1/2))*e+1/4*I/(c^2*d+e)*c^2/d^2*s
um((_R1^2*e-4*c^2*d-e)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c
^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf
(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/(c^2*d+e)/d^3*e*arcsin(c*x)*ln(1+I*c*x+(-
c^2*x^2+1)^(1/2))+1/4*I/(c^2*d+e)/d^3*e*sum((_R1^2*e-4*c^2*d-e)/(_R1^2*e-2*
c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I
*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e)))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d+ex^2\right)^3}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(ex^2+d\right)^3x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e^3*x^7 + 3*d*e^2*x^5 + 3*d^2*e*x^3 + d^3*x),
 x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d+ex^2\right)^3}\,dx=\int \frac{a+b\,\mathrm{asin}\left(cx\right)}{x\left(d+ex^2\right)^3}\,dx$$

```
[In] integrate((a+b*asin(c*x))/x/(e*x**2+d)**3,x)
```

```
[Out] Integral((a + b*asin(c*x))/(x*(d + e*x**2)**3), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x\left(d+ex^2\right)^3}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(ex^2+d\right)^3x}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*((2*e*x^2 + 3*d)/(d^2*e^2*x^4 + 2*d^3*e*x^2 + d^4) - 2*log(e*x^2 + d)
/d^3 + 4*log(x)/d^3) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))/(e^3*x^7 + 3*d*e^2*x^5 + 3*d^2*e*x^3 + d^3*x), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x\left(d+ex^2\right)^3}\,dx = \text{Timed out}$$

```
[In] integrate((a+b*arcsin(c*x))/x/(e*x^2+d)^3,x, algorithm="giac")
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x\left(d+ex^2\right)^3}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{x\,\left(e\,x^2+d\right)^3}\,dx$$

```
[In] int((a + b*asin(c*x))/(x*(d + e*x^2)^3),x)
[Out] int((a + b*asin(c*x))/(x*(d + e*x^2)^3), x)
```

3.645 $\int \frac{a+b\arcsin(cx)}{x^3(d+ex^2)^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 783

$$\int \frac{a+b\arcsin(cx)}{x^3(d+ex^2)^3}\,dx = -\frac{bc\sqrt{1-c^2x^2}}{2d^3x}+\frac{bce^2x\sqrt{1-c^2x^2}}{8d^3(c^2d+e)(d+ex^2)}-\frac{a+b\arcsin(cx)}{2d^3x^2}-\frac{e(a+b\arcsin(cx))}{4d^2(d+ex^2)^2}-\frac{e(a+b\arcsin(cx))}{d^3(d+ex^2)}+\frac{bce\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{d^{7/2}\sqrt{c^2d+e}}+\frac{bce(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{7/2}(c^2d+e)^{3/2}}+\frac{3e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^4}+\frac{3e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^4}+\frac{3e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^4}+\frac{3e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^4}-\frac{3e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^4}-\frac{3ibe\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^4}-\frac{3ibe\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^4}-\frac{3ibe\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^4}-\frac{3ibe\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^4}+\frac{3ibe\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^4}$$

```
[Out] 1/2*(-a-b*arcsin(c*x))/d^3/x^2-1/4*e*(a+b*arcsin(c*x))/d^2/(e*x^2+d)^2-e*(a
+b*arcsin(c*x))/d^3/(e*x^2+d)+1/8*b*c*e*(2*c^2*d+e)*arctan(x*(c^2*d+e)^(1/2
)/d^(1/2)/(-c^2*x^2+1)^(1/2))/d^(7/2)/(c^2*d+e)^(3/2)-3*e*(a+b*arcsin(c*x))
*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^4+3/2*e*(a+b*arcsin(c*x))*ln(1-(I*c*x
+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^4+3/2*e*(a
+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^
2*d+e)^(1/2)))/d^4+3/2*e*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*
e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^4+3/2*e*(a+b*arcsin(c*x))*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^4+3/
2*I*b*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))^2)/d^4-3/2*I*b*e*polylog(2,(I*
```

```
c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^4-3/2*I
*b*e*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e
)^(1/2)))/d^4-3/2*I*b*e*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*
(-d)^(1/2)+(c^2*d+e)^(1/2)))/d^4-3/2*I*b*e*polylog(2,(I*c*x+(-c^2*x^2+1)^(1
/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/d^4+b*c*e*arctan(x*(c^2*d+e)
^(1/2)/d^(1/2)/(-c^2*x^2+1)^(1/2))/d^(7/2)/(c^2*d+e)^(1/2)-1/2*b*c*(-c^2*x^
2+1)^(1/2)/d^3/x+1/8*b*c*e^2*x*(-c^2*x^2+1)^(1/2)/d^3/(c^2*d+e)/(e*x^2+d)
```

Rubi [A] (verified)

Time = 0.81 (sec) , antiderivative size = 783, normalized size of antiderivative = 1.00, number of steps used = 34, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4817, 4723, 270, 4721, 3798, 2221, 2317, 2438, 4813, 390, 385, 211, 4825, 4617}

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{x^3(d+ex^2)^3}\,dx =& \frac{3e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^4} \\ &+\frac{3e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^4} \\ &+\frac{3e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^4} \\ &+\frac{3e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{\sqrt{c^2d+e}+ic\sqrt{-d}}\right)}{2d^4} \\ &-\frac{3e\log\left(1-e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{d^4} \\ &-\frac{e(a+b\arcsin(cx))}{d^3(d+ex^2)}-\frac{a+b\arcsin(cx)}{2d^3x^2} \\ &-\frac{e(a+b\arcsin(cx))}{4d^2(d+ex^2)^2}-\frac{3ibe\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d^4} \\ &-\frac{3ibe\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2d^4} \\ &-\frac{3ibe\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2d^4} \\ &-\frac{3ibe\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2d^4}+\frac{3ibe\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^4} \\ &+\frac{bce(2c^2d+e)\arctan\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{7/2}(c^2d+e)^{3/2}}+\frac{bce\arctan\left(\frac{x\sqrt{c^2d+e}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{d^{7/2}\sqrt{c^2d+e}} \\ &+\frac{bce^2x\sqrt{1-c^2x^2}}{8d^3(c^2d+e)(d+ex^2)}-\frac{bc\sqrt{1-c^2x^2}}{2d^3x}\end{aligned}$$

```
[In] Int[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^3),x]
```

```
[Out] -1/2*(b*c*Sqrt[1 - c^2*x^2])/(d^3*x) + (b*c*e^2*x*Sqrt[1 - c^2*x^2])/(8*d^3
*(c^2*d + e)*(d + e*x^2)) - (a + b*ArcSin[c*x])/(2*d^3*x^2) - (e*(a + b*Arc
Sin[c*x]))/(4*d^2*(d + e*x^2)^2) - (e*(a + b*ArcSin[c*x]))/(d^3*(d + e*x^2)
) + (b*c*e*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[d]*Sqrt[1 - c^2*x^2])])/(d^(7/2
)*Sqrt[c^2*d + e]) + (b*c*e*(2*c^2*d + e)*ArcTan[(Sqrt[c^2*d + e]*x)/(Sqrt[
d]*Sqrt[1 - c^2*x^2])])/(8*d^(7/2)*(c^2*d + e)^(3/2)) + (3*e*(a + b*ArcSin[
c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])]
)/(2*d^4) + (3*e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*d^4) + (3*e*(a + b*ArcSin[c*x])*Log[1 -
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*d^4) + (
3*e*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] +
 Sqrt[c^2*d + e])])/(2*d^4) - (3*e*(a + b*ArcSin[c*x])*Log[1 - E^((2*I)*Arc
Sin[c*x])])/d^4 - (((3*I)/2)*b*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(
I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/d^4 - (((3*I)/2)*b*e*PolyLog[2, (Sqrt[e]
*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/d^4 - (((3*I)/2)*b*e
*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))
])/d^4 - (((3*I)/2)*b*e*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d
] + Sqrt[c^2*d + e])])/d^4 + (((3*I)/2)*b*e*PolyLog[2, E^((2*I)*ArcSin[c*x]
)])/d^4
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 390

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[(-b)*x*(a + b*x^n)^(p + 1)*((c + d*x^n)^(q + 1)/(a*n*(p + 1)*(b*c -
 a*d))), x] + Dist[(b*c + n*(p + 1)*(b*c - a*d))/(a*n*(p + 1)*(b*c - a*d)),
 Int[(a + b*x^n)^(p + 1)*(c + d*x^n)^q, x], x] /; FreeQ[{a, b, c, d, n, q},
 x] && NeQ[b*c - a*d, 0] && EqQ[n*(p + q + 2) + 1, 0] && (LtQ[p, -1] ||  !L
tQ[q, -1]) && NeQ[p, -1]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3798

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Dist[2*I, Int[(c + d*x)^m
*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4721

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4813

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(x_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])/(2*e*(p + 1))), x]
 - Dist[b*(c/(2*e*(p + 1))), Int[(d + e*x^2)^(p + 1)/Sqrt[1 - c^2*x^2], x],
 x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[c^2*d + e, 0] && NeQ[p, -1]
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rubi steps

$$\text{integral} = \int \left(\frac{a+b\arcsin(cx)}{d^3x^3} - \frac{3e(a+b\arcsin(cx))}{d^4x} + \frac{e^2x(a+b\arcsin(cx))}{d^2(d+ex^2)^3} + \frac{2e^2x(a+b\arcsin(cx))}{d^3(d+ex^2)^2} + \frac{3e^2x(a+b\arcsin(cx))}{d^4(d+ex^2)}\right) dx$$

$$= \frac{\int \frac{a+b\arcsin(cx)}{x^3}\,dx}{d^3} - \frac{(3e)\int \frac{a+b\arcsin(cx)}{x}\,dx}{d^4} + \frac{(3e^2)\int \frac{x(a+b\arcsin(cx))}{d+ex^2}\,dx}{d^4} + \frac{(2e^2)\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx}{d^3} + \frac{e^2\int \frac{x(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx}{d^2}$$

$$= -\frac{a+b\arcsin(cx)}{2d^3x^2} - \frac{e(a+b\arcsin(cx))}{4d^2(d+ex^2)^2} - \frac{e(a+b\arcsin(cx))}{d^3(d+ex^2)} + \frac{(bc)\int \frac{1}{x^2\sqrt{1-c^2x^2}}\,dx}{2d^3} - \frac{(3e)\text{Subst}\left(\int (a+bx)\cot(x)\,dx, x, \arcsin(cx)\right)}{d^4} + \frac{(bce)\int \frac{1}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{d^3} + \frac{(bce)\int \frac{1}{\sqrt{1-c^2x^2}(d+ex^2)^2}\,dx}{4d^2} + \frac{(3e^2)\int \left(-\frac{a+b\arcsin(cx)}{2\sqrt{e}(\sqrt{-d}-\sqrt{e}x)} + \frac{a+b\arcsin(cx)}{2\sqrt{e}(\sqrt{-d}+\sqrt{e}x)}\right) dx}{d^4}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3(c^2d+e)(d+ex^2)} - \frac{a+b\arcsin(cx)}{2d^3x^2} - \frac{e(a+b\arcsin(cx))}{4d^2(d+ex^2)^2} - \frac{e(a+b\arcsin(cx))}{d^3(d+ex^2)} + \frac{3ie(a+b\arcsin(cx))^2}{2bd^4} + \frac{(6ie)\text{Subst}\left(\int \frac{e^{2ix}(a+bx)}{1-e^{2ix}}\,dx, x, \arcsin(cx)\right)}{d^4} + \frac{(bce)\text{Subst}\left(\int \frac{1}{d-(-c^2d-e)x^2}\,dx, x, \frac{x}{\sqrt{1-c^2x^2}}\right)}{d^3} - \frac{\left(3e^{3/2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2d^4} + \frac{\left(3e^{3/2}\right)\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2d^4} + \frac{(bce(2c^2d+e))\int \frac{1}{\sqrt{1-c^2x^2}(d+ex^2)}\,dx}{8d^3(c^2d+e)}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3(c^2d+e)(d+ex^2)} - \frac{a+b\arcsin(cx)}{2d^3x^2} - \frac{e(a+b\arcsin(cx))}{4d^2(d+ex^2)^2} - \frac{e(a+b\arcsin(cx))}{d^3(d+ex^2)} + \frac{3ie(a+b\arcsin(cx))^2}{2bd^4} + \frac{bce\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{d^{7/2}\sqrt{c^2d+e}} - \frac{3e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^4} + \frac{(3be)\text{Subst}\left(\int \log\left(1-e^{2ix}\right)\,dx, x, \arcsin(cx)\right)}{d^4} - \frac{\left(3e^{3/2}\right)\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{2d^4} + \frac{\left(3e^{3/2}\right)\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{2d^4} + \frac{(bce(2c^2d+e))\text{Subst}\left(\int \frac{1}{d-(-c^2d-e)x^2}\,dx, x, \frac{x}{\sqrt{1-c^2x^2}}\right)}{8d^3(c^2d+e)}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3(c^2d+e)(d+ex^2)} - \frac{a+b\arcsin(cx)}{2d^3x^2}$$
$$- \frac{e(a+b\arcsin(cx))}{4d^2(d+ex^2)^2} - \frac{e(a+b\arcsin(cx))}{d^3(d+ex^2)} + \frac{bce\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{d^{7/2}\sqrt{c^2d+e}}$$
$$+ \frac{bce(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{7/2}(c^2d+e)^{3/2}} - \frac{3e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^4}$$
$$- \frac{(3ibe)\text{Subst}\left(\int\frac{\log(1-x)}{x}\,dx, x, e^{2i\arcsin(cx)}\right)}{2d^4}$$
$$- \frac{(3ie^{3/2})\,\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2d^4}$$
$$- \frac{(3ie^{3/2})\,\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2d^4}$$
$$+ \frac{(3ie^{3/2})\,\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2d^4}$$
$$+ \frac{(3ie^{3/2})\,\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2d^4}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3\left(c^2d+e\right)\left(d+ex^2\right)} - \frac{a+b\arcsin(cx)}{2d^3x^2} - \frac{e(a+b\arcsin(cx))}{4d^2\left(d+ex^2\right)^2} - \frac{e(a+b\arcsin(cx))}{d^3\left(d+ex^2\right)} + \frac{bce\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{d^{7/2}\sqrt{c^2d+e}} + \frac{bce(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+e}x}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{7/2}\left(c^2d+e\right)^{3/2}} + \frac{3e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^4} + \frac{3e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^4} + \frac{3e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^4} + \frac{3e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^4} - \frac{3e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^4} + \frac{3ibe\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^4} - \frac{(3be)\mathrm{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{2d^4} - \frac{(3be)\mathrm{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{2d^4} - \frac{(3be)\mathrm{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{2d^4} - \frac{(3be)\mathrm{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{2d^4}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3(c^2d+e)(d+ex^2)} - \frac{a+b\arcsin(cx)}{2d^3x^2} - \frac{e(a+b\arcsin(cx))}{4d^2(d+ex^2)^2} - \frac{e(a+b\arcsin(cx))}{d^3(d+ex^2)} + \frac{bce\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{d^{7/2}\sqrt{c^2d+e}} + \frac{bce(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{7/2}(c^2d+e)^{3/2}} + \frac{3e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^4} + \frac{3e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^4} + \frac{3e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^4} + \frac{3e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^4} - \frac{3e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^4} + \frac{3ibe\,\text{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^4} + \frac{(3ibe)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2d^4} + \frac{(3ibe)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2d^4} + \frac{(3ibe)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2d^4} + \frac{(3ibe)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{2d^4}$$

$$= -\frac{bc\sqrt{1-c^2x^2}}{2d^3x} + \frac{bce^2x\sqrt{1-c^2x^2}}{8d^3(c^2d+e)(d+ex^2)} - \frac{a+b\arcsin(cx)}{2d^3x^2} - \frac{e(a+b\arcsin(cx))}{4d^2(d+ex^2)^2} - \frac{e(a+b\arcsin(cx))}{d^3(d+ex^2)} + \frac{bce\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{d^{7/2}\sqrt{c^2d+e}} + \frac{bce(2c^2d+e)\arctan\left(\frac{\sqrt{c^2d+ex}}{\sqrt{d}\sqrt{1-c^2x^2}}\right)}{8d^{7/2}(c^2d+e)^{3/2}} + \frac{3e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^4} + \frac{3e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^4} + \frac{3e(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^4} + \frac{3e(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^4} - \frac{3e(a+b\arcsin(cx))\log\left(1-e^{2i\arcsin(cx)}\right)}{d^4} - \frac{3ibe\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^4} - \frac{3ibe\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2d^4} - \frac{3ibe\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^4} - \frac{3ibe\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2d^4} + \frac{3ibe\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx)}\right)}{2d^4}$$

Mathematica [A] (verified)

Time = 5.65 (sec) , antiderivative size = 1065, normalized size of antiderivative = 1.36

$$\int \frac{a+b\arcsin(cx)}{x^3(d+ex^2)^3}\,dx$$

$$= \frac{-\frac{8ad}{x^2} - \frac{4ad^2e}{(d+ex^2)^2} - \frac{16ade}{d+ex^2} - 48ae\log(x) + 24ae\log(d+ex^2) + b\left(-\frac{8cd\sqrt{1-c^2x^2}}{x} + \frac{cde^{3/2}\sqrt{1-c^2x^2}}{(c^2d+e)\left(-i\sqrt{d}+\sqrt{e}x\right)} + \frac{cde^{3/2}}{(c^2d+e}\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(x^3*(d + e*x^2)^3),x]
```

```
[Out] ((-8*a*d)/x^2 - (4*a*d^2*e)/(d + e*x^2)^2 - (16*a*d*e)/(d + e*x^2) - 48*a*e
*Log[x] + 24*a*e*Log[d + e*x^2] + b*((-8*c*d*Sqrt[1 - c^2*x^2])/x + (c*d*e^
(3/2)*Sqrt[1 - c^2*x^2])/((c^2*d + e)*((-I)*Sqrt[d] + Sqrt[e]*x)) + (c*d*e^
(3/2)*Sqrt[1 - c^2*x^2])/((c^2*d + e)*(I*Sqrt[d] + Sqrt[e]*x)) - (8*d*ArcSi
n[c*x])/x^2 - (9*Sqrt[d]*e*ArcSin[c*x])/(Sqrt[d] - I*Sqrt[e]*x) - (d*e*ArcS
in[c*x])/(Sqrt[d] + I*Sqrt[e]*x)^2 - (9*Sqrt[d]*e*ArcSin[c*x])/(Sqrt[d] + I
*Sqrt[e]*x) + (d*e*ArcSin[c*x])/(I*Sqrt[d] + Sqrt[e]*x)^2 + (9*c*Sqrt[d]*e*
```

```
ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sq
rt[c^2*d + e] - ((9*I)*c*Sqrt[d]*e*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqr
t[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e] + 24*e*ArcSin[c*x]*Log[1
+ (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 24*e*ArcSin[
c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])]
+ 24*e*ArcSin[c*x]*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^
2*d + e])] + 24*e*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d
] + Sqrt[c^2*d + e])] - 48*e*ArcSin[c*x]*Log[1 - E^((2*I)*ArcSin[c*x])] + (
I*c^3*d^(3/2)*e*Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] - I*c^2*Sqrt[d]*x + Sqrt[c^
2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d + I*Sqrt[d]*Sqrt[e]*x))])/(c^2*d + e)^
(3/2) - (I*c^3*d^(3/2)*e*Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] + I*c^2*Sqrt[d]*x
+ Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d - I*Sqrt[d]*Sqrt[e]*x))])/(c^
2*d + e)^(3/2) - (24*I)*e*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d]
 - Sqrt[c^2*d + e])] - (24*I)*e*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c
*Sqrt[d]) + Sqrt[c^2*d + e])] - (24*I)*e*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[
c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))] - (24*I)*e*PolyLog[2, (Sqrt[e]*E^(I*
ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])] + (24*I)*e*PolyLog[2, E^((2*I)
*ArcSin[c*x])]))/(16*d^4)
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 2.52 (sec) , antiderivative size = 1344, normalized size of antiderivative = 1.72

method	result	size
parts	Expression too large to display	1344
derivativedivides	Expression too large to display	1395
default	Expression too large to display	1395

```
[In] int((a+b*arcsin(c*x))/x^3/(e*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*a/d^3/x^2-3*a/d^4*e*ln(x)-1/4*a*e/d^2/(e*x^2+d)^2+3/2*a*e/d^4*ln(e*x^2
+d)-a*e/d^3/(e*x^2+d)+b*c^2*(-1/8*(-4*I*c^8*d*e^2*x^6-8*I*c^8*d^2*e*x^4-3*I
*c^6*d^2*e*x^2+4*(-c^2*x^2+1)^(1/2)*c^7*d^3*x+8*(-c^2*x^2+1)^(1/2)*c^7*d^2*
e*x^3+4*(-c^2*x^2+1)^(1/2)*c^7*d*e^2*x^5+4*c^6*d^3*arcsin(c*x)+18*arcsin(c*
x)*c^6*d^2*e*x^2+12*arcsin(c*x)*c^6*d*e^2*x^4-6*I*c^6*d*e^2*x^4-3*I*e^3*c^6
*x^6-4*I*c^8*d^3*x^2+4*(-c^2*x^2+1)^(1/2)*c^5*d^2*e*x+7*(-c^2*x^2+1)^(1/2)*
c^5*d*e^2*x^3+3*(-c^2*x^2+1)^(1/2)*e^3*c^5*x^5+4*c^4*d^2*e*arcsin(c*x)+18*a
rcsin(c*x)*c^4*d*e^2*x^2+12*arcsin(c*x)*e^3*c^4*x^4)/c^2/x^2/d^3/(c^2*e*x^2
+c^2*d)^2/(c^2*d+e)-9/8*I*(d*c^2*(c^2*d+e))^(1/2)/(c^2*d+e)^2/d^4/c^2*arcta
nh(1/4*(2*e*(I*c*x+(-c^2*x^2+1)^(1/2))^2-4*c^2*d-2*e)/(c^4*d^2+c^2*d*e)^(1/
2))*e^2-3*I/(c^2*d+e)/d^3*e*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+3*I/(c^2*d+e)*e
/d^3*dilog(1+I*c*x+(-c^2*x^2+1)^(1/2))-3/4*I/(c^2*d+e)*e/d^3*sum((_R1^2*e-4
*c^2*d-e)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/
```

```
2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c
^2*d-2*e)*_Z^2+e))-3/4*I/(c^2*d+e)*e^2/d^3*sum((_R1^2-1)/(_R1^2*e-2*c^2*d-e
)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-
c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-3/(c^2*d+
e)/d^3*e*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(1/2))-3/4*I/(c^2*d+e)*e^2/d^4
/c^2*sum((_R1^2*e-4*c^2*d-e)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c
*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=
RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-3/4*I/(c^2*d+e)*e^3/d^4/c^2*sum((_R1^
2-1)/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_
R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-
2*e)*_Z^2+e))-3/(c^2*d+e)*e^2/d^4/c^2*arcsin(c*x)*ln(1+I*c*x+(-c^2*x^2+1)^(
1/2))-5/4*I*(d*c^2*(c^2*d+e))^(1/2)/(c^2*d+e)^2/d^3*arctanh(1/4*(2*e*(I*c*x
+(-c^2*x^2+1)^(1/2))^2-4*c^2*d-2*e)/(c^4*d^2+c^2*d*e)^(1/2))*e-3*I/(c^2*d+e
)*e^2/d^4/c^2*dilog(I*c*x+(-c^2*x^2+1)^(1/2))+3*I/(c^2*d+e)*e^2/d^4/c^2*dil
og(1+I*c*x+(-c^2*x^2+1)^(1/2)))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)^3}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(ex^2+d\right)^3x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*arcsin(c*x) + a)/(e^3*x^9 + 3*d*e^2*x^7 + 3*d^2*e*x^5 + d^3*x^3
), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)^3}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*asin(c*x))/x**3/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)^3}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(ex^2+d\right)^3x^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a*((6*e^2*x^4 + 9*d*e*x^2 + 2*d^2)/(d^3*e^2*x^6 + 2*d^4*e*x^4 + d^5*x^
2) - 6*e*log(e*x^2 + d)/d^4 + 12*e*log(x)/d^4) + b*integrate(arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))/(e^3*x^9 + 3*d*e^2*x^7 + 3*d^2*e*x^5 + d^3*x^3
), x)
```

Giac [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)^3}\,dx=\text{Timed out}$$

```
[In] integrate((a+b*arcsin(c*x))/x^3/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{x^3\left(d+ex^2\right)^3}\,dx=\int \frac{a+b\,\mathrm{asin}\left(c\,x\right)}{x^3\,{\left(e\,x^2+d\right)}^3}\,dx$$

```
[In] int((a + b*asin(c*x))/(x^3*(d + e*x^2)^3),x)
```

```
[Out] int((a + b*asin(c*x))/(x^3*(d + e*x^2)^3), x)
```

3.646 $\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 1082

$$\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{\sqrt{-d}(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2}+\frac{5(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\sqrt{-d}(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)^2}-\frac{5(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{bc^3d\,\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{5/2}(c^2d+e)^{3/2}}-\frac{5bc\,\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{5/2}\sqrt{c^2d+e}}+\frac{bc^3d\,\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{5/2}(c^2d+e)^{3/2}}-\frac{5bc\,\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{5/2}\sqrt{c^2d+e}}+\frac{3(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16\sqrt{-d}e^{5/2}}-\frac{3(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16\sqrt{-d}e^{5/2}}+\frac{3(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16\sqrt{-d}e^{5/2}}-\frac{3(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16\sqrt{-d}e^{5/2}}+\frac{3ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16\sqrt{-d}e^{5/2}}-\frac{3ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16\sqrt{-d}e^{5/2}}+\frac{3ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16\sqrt{-d}e^{5/2}}-\frac{3ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16\sqrt{-d}e^{5/2}}$$

```
[Out] 1/16*b*c^3*d*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+
1)^(1/2))/e^(5/2)/(c^2*d+e)^(3/2)+1/16*b*c^3*d*arctanh((c^2*x*(-d)^(1/2)+e^
(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/e^(5/2)/(c^2*d+e)^(3/2)+3/16*(a+
b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2
```

```
*d+e)^(1/2)))/e^(5/2)/(-d)^(1/2)-3/16*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x
^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/e^(5/2)/(-d)^(1/2)+3
/16*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/
2)+(c^2*d+e)^(1/2)))/e^(5/2)/(-d)^(1/2)-3/16*(a+b*arcsin(c*x))*ln(1+(I*c*x+
(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(5/2)/(-d)^
(1/2)-3/16*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)
-(c^2*d+e)^(1/2)))/e^(5/2)/(-d)^(1/2)-3/16*I*b*polylog(2,(I*c*x+(-c^2*x^2+1
)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(5/2)/(-d)^(1/2)+3/16*
I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)
^(1/2)))/e^(5/2)/(-d)^(1/2)+3/16*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*
e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/e^(5/2)/(-d)^(1/2)-1/16*(a+b*arcs
in(c*x))*(-d)^(1/2)/e^(5/2)/((-d)^(1/2)-x*e^(1/2))^2+5/16*(a+b*arcsin(c*x))
/e^(5/2)/((-d)^(1/2)-x*e^(1/2))+1/16*(a+b*arcsin(c*x))*(-d)^(1/2)/e^(5/2)/(
(-d)^(1/2)+x*e^(1/2))^2-5/16*(a+b*arcsin(c*x))/e^(5/2)/((-d)^(1/2)+x*e^(1/2
))-5/16*b*c*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1
)^(1/2))/e^(5/2)/(c^2*d+e)^(1/2)-5/16*b*c*arctanh((c^2*x*(-d)^(1/2)+e^(1/2)
)/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/e^(5/2)/(c^2*d+e)^(1/2)+1/16*b*c*(-d)
^(1/2)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d+e)/((-d)^(1/2)-x*e^(1/2))+1/16*b*c*(-d
)^(1/2)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d+e)/((-d)^(1/2)+x*e^(1/2))
```

Rubi [A] (verified)

Time = 2.41 (sec) , antiderivative size = 1082, normalized size of antiderivative = 1.00, number of steps used = 80, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.524$, Rules

used = {4817, 4757, 4827, 745, 739, 212, 4825, 4617, 2221, 2317, 2438}

$$\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \frac{bd\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c^3}{16e^{5/2}(dc^2+e)^{3/2}} + \frac{bd\text{arctanh}\left(\frac{\sqrt{-d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c^3}{16e^{5/2}(dc^2+e)^{3/2}} - \frac{5b\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c}{16e^{5/2}\sqrt{dc^2+e}} - \frac{5b\text{arctanh}\left(\frac{\sqrt{-d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c}{16e^{5/2}\sqrt{dc^2+e}} + \frac{b\sqrt{-d}\sqrt{1-c^2x^2}c}{16e^2(dc^2+e)(\sqrt{-d}-\sqrt{e}x)} + \frac{b\sqrt{-d}\sqrt{1-c^2x^2}c}{16e^2(dc^2+e)(\sqrt{e}x+\sqrt{-d})} + \frac{5(a+b\arcsin(cx))}{16e^{5/2}(\sqrt{-d}-\sqrt{e}x)} - \frac{5(a+b\arcsin(cx))}{16e^{5/2}(\sqrt{e}x+\sqrt{-d})} - \frac{\sqrt{-d}(a+b\arcsin(cx))}{16e^{5/2}(\sqrt{-d}-\sqrt{e}x)^2} + \frac{\sqrt{-d}(a+b\arcsin(cx))}{16e^{5/2}(\sqrt{e}x+\sqrt{-d})^2} + \frac{3(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{16\sqrt{-d}e^{5/2}} - \frac{3(a+b\arcsin(cx))\log\left(\frac{e^{i\arcsin(cx)}\sqrt{e}}{ic\sqrt{-d}-\sqrt{dc^2+e}}+1\right)}{16\sqrt{-d}e^{5/2}} + \frac{3(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{16\sqrt{-d}e^{5/2}} - \frac{3(a+b\arcsin(cx))\log\left(\frac{e^{i\arcsin(cx)}\sqrt{e}}{i\sqrt{-d}c+\sqrt{dc^2+e}}+1\right)}{16\sqrt{-d}e^{5/2}} + \frac{3ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{16\sqrt{-d}e^{5/2}} - \frac{3ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{16\sqrt{-d}e^{5/2}} + \frac{3ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{16\sqrt{-d}e^{5/2}} - \frac{3ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{16\sqrt{-d}e^{5/2}}$$

```
[In] Int[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (b*c*Sqrt[-d]*Sqrt[1 - c^2*x^2])/(16*e^2*(c^2*d + e)*(Sqrt[-d] - Sqrt[e]*x)
) + (b*c*Sqrt[-d]*Sqrt[1 - c^2*x^2])/(16*e^2*(c^2*d + e)*(Sqrt[-d] + Sqrt[e
]*x)) - (Sqrt[-d]*(a + b*ArcSin[c*x]))/(16*e^(5/2)*(Sqrt[-d] - Sqrt[e]*x)^2
) + (5*(a + b*ArcSin[c*x]))/(16*e^(5/2)*(Sqrt[-d] - Sqrt[e]*x)) + (Sqrt[-d]
*(a + b*ArcSin[c*x]))/(16*e^(5/2)*(Sqrt[-d] + Sqrt[e]*x)^2) - (5*(a + b*Arc
```

```
Sin[c*x]))/(16*e^(5/2)*(Sqrt[-d] + Sqrt[e]*x)) + (b*c^3*d*ArcTanh[(Sqrt[e]
- c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])]])/(16*e^(5/2)*(c^2*d
+ e)^(3/2)) - (5*b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sq
rt[1 - c^2*x^2])]])/(16*e^(5/2)*Sqrt[c^2*d + e]) + (b*c^3*d*ArcTanh[(Sqrt[e]
 + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])]])/(16*e^(5/2)*(c^2*d
 + e)^(3/2)) - (5*b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*S
qrt[1 - c^2*x^2])]])/(16*e^(5/2)*Sqrt[c^2*d + e]) + (3*(a + b*ArcSin[c*x])*L
og[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*S
qrt[-d]*e^(5/2)) - (3*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]
))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*Sqrt[-d]*e^(5/2)) + (3*(a + b*Arc
Sin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d +
e])])/(16*Sqrt[-d]*e^(5/2)) - (3*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*
ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*Sqrt[-d]*e^(5/2)) + ((
(3*I)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c
^2*d + e]))])/(Sqrt[-d]*e^(5/2)) - (((3*I)/16)*b*PolyLog[2, (Sqrt[e]*E^(I*A
rcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(Sqrt[-d]*e^(5/2)) + (((3*I
)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d
 + e]))])/(Sqrt[-d]*e^(5/2)) - (((3*I)/16)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*e^(5/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 745

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/((m + 1)*(c*d^2 + a*e^2))), x] + D
ist[c*(d/(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; F
reeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p + 3, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
```

```
&& NeQ[m, -1]
```

Rubi steps

$$\text{integral} = \int \left(\frac{d^2(a+b\arcsin(cx))}{e^2(d+ex^2)^3} - \frac{2d(a+b\arcsin(cx))}{e^2(d+ex^2)^2} + \frac{a+b\arcsin(cx)}{e^2(d+ex^2)}\right)dx$$

$$= \frac{\int \frac{a+b\arcsin(cx)}{d+ex^2}dx}{e^2} - \frac{(2d)\int \frac{a+b\arcsin(cx)}{(d+ex^2)^2}dx}{e^2} + \frac{d^2\int \frac{a+b\arcsin(cx)}{(d+ex^2)^3}dx}{e^2}$$

$$= \frac{\int \left(\frac{\sqrt{-d}(a+b\arcsin(cx))}{2d(\sqrt{-d}-\sqrt{e}x)} + \frac{\sqrt{-d}(a+b\arcsin(cx))}{2d(\sqrt{-d}+\sqrt{e}x)}\right)dx}{e^2}$$

$$- \frac{(2d)\int \left(-\frac{e(a+b\arcsin(cx))}{4d(\sqrt{-d}\sqrt{e}-ex)^2} - \frac{e(a+b\arcsin(cx))}{4d(\sqrt{-d}\sqrt{e}+ex)^2} - \frac{e(a+b\arcsin(cx))}{2d(-de-e^2x^2)}\right)dx}{e^2}$$

$$+ \frac{d^2\int \left(-\frac{e^{3/2}(a+b\arcsin(cx))}{8(-d)^{3/2}(\sqrt{-d}\sqrt{e}-ex)^3} - \frac{3e(a+b\arcsin(cx))}{16d^2(\sqrt{-d}\sqrt{e}-ex)^2} - \frac{e^{3/2}(a+b\arcsin(cx))}{8(-d)^{3/2}(\sqrt{-d}\sqrt{e}+ex)^3} - \frac{3e(a+b\arcsin(cx))}{16d^2(\sqrt{-d}\sqrt{e}+ex)^2} - \frac{3e(a+b\operatorname{ar}}{8d^2(-de}\right.}{e^2}$$

$$= -\frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}dx}{2\sqrt{-d}e^2} - \frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}dx}{2\sqrt{-d}e^2} - \frac{3\int \frac{a+b\arcsin(cx)}{(\sqrt{-d}\sqrt{e}-ex)^2}dx}{16e} - \frac{3\int \frac{a+b\arcsin(cx)}{(\sqrt{-d}\sqrt{e}+ex)^2}dx}{16e}$$

$$- \frac{3\int \frac{a+b\arcsin(cx)}{-de-e^2x^2}dx}{8e} + \frac{\int \frac{a+b\arcsin(cx)}{(\sqrt{-d}\sqrt{e}-ex)^2}dx}{2e} + \frac{\int \frac{a+b\arcsin(cx)}{(\sqrt{-d}\sqrt{e}+ex)^2}dx}{2e}$$

$$+ \frac{\int \frac{a+b\arcsin(cx)}{-de-e^2x^2}dx}{e} - \frac{\sqrt{-d}\int \frac{a+b\arcsin(cx)}{(\sqrt{-d}\sqrt{e}-ex)^3}dx}{8\sqrt{e}} - \frac{\sqrt{-d}\int \frac{a+b\arcsin(cx)}{(\sqrt{-d}\sqrt{e}+ex)^3}dx}{8\sqrt{e}}$$

$$= -\frac{\sqrt{-d}(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2} + \frac{5(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{\sqrt{-d}(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)^2}$$
$$- \frac{5(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{(3bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)\sqrt{1-c^2x^2}}\,dx}{16e^2}$$
$$- \frac{(3bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)\sqrt{1-c^2x^2}}\,dx}{16e^2} - \frac{(bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)\sqrt{1-c^2x^2}}\,dx}{2e^2}$$
$$+ \frac{(bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)\sqrt{1-c^2x^2}}\,dx}{2e^2} - \frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{2\sqrt{-d}e^2}$$
$$- \frac{\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{2\sqrt{-d}e^2}$$
$$+ \frac{\left(bc\sqrt{-d}\right)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2\sqrt{1-c^2x^2}}\,dx}{16e^{3/2}} - \frac{\left(bc\sqrt{-d}\right)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2\sqrt{1-c^2x^2}}\,dx}{16e^{3/2}}$$
$$- \frac{3\int \left(-\frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{8e}$$
$$+ \frac{\int \left(-\frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{e}$$

$$= \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{\sqrt{-d}(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2} + \frac{5(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{\sqrt{-d}(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)^2} - \frac{5(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{(3bc)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{-e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{16e^2} + \frac{(3bc)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{16e^2} + \frac{(bc)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{-e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{2e^2} - \frac{(bc)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{2e^2} - \frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2\sqrt{-d}e^2} - \frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2\sqrt{-d}e^2} - \frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2\sqrt{-d}e^2} - \frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{2\sqrt{-d}e^2} - \frac{3\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{16\sqrt{-d}e^2} - \frac{3\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{16\sqrt{-d}e^2} + \frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2\sqrt{-d}e^2} + \frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2\sqrt{-d}e^2} + \frac{(bc^3d)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)\sqrt{1-c^2x^2}}\,dx}{16e^2(c^2d+e)} - \frac{(bc^3d)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)\sqrt{1-c^2x^2}}\,dx}{16e^2(c^2d+e)}$$

$$= \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{-d}\sqrt{1-c^2x^2}}{16e^2(c^2d+e)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{\sqrt{-d}(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2} + \frac{5(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{\sqrt{-d}(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)^2} - \frac{5(a+b\arcsin(cx))}{16e^{5/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{5bc\,\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{5/2}\sqrt{c^2d+e}} - \frac{5bc\,\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{5/2}\sqrt{c^2d+e}} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{5/2}} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{5/2}} + \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{5/2}} - \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}e^{5/2}} - \frac{b\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{2\sqrt{-d}e^{5/2}} + \frac{b\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{2\sqrt{-d}e^{5/2}} - \frac{b\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{2\sqrt{-d}e^{5/2}} + \frac{b\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{2\sqrt{-d}e^{5/2}} - \frac{3\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}dx,x,\arcsin(cx)\right)}{16\sqrt{-d}e^2} - \frac{3\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}dx,x,\arcsin(cx)\right)}{16\sqrt{-d}e^2} + \frac{\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}dx,x,\arcsin(cx)\right)}{2\sqrt{-d}e^2} + \frac{\text{Subst}\left(\int\frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}dx,x,\arcsin(cx)\right)}{2\sqrt{-d}e^2} - \frac{(bc^3d)\text{Subst}\left(\int\frac{1}{c^2de+e^2-x^2}dx,x,\frac{-e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{16e^2(c^2d+e)} + \frac{(bc^3d)\text{Subst}\left(\int\frac{1}{c^2de+e^2-x^2}dx,x,\frac{e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{16e^2(c^2d+e)}$$

= Too large to display

Mathematica [A] (verified)

Time = 4.47 (sec) , antiderivative size = 1014, normalized size of antiderivative = 0.94

$$\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx$$

$$= \frac{-\frac{ibc\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}}{(c^2d+e)\left(-i\sqrt{d}+\sqrt{e}x\right)}+\frac{ibc\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}}{(c^2d+e)\left(i\sqrt{d}+\sqrt{e}x\right)}+\frac{4ad\sqrt{e}x}{(d+ex^2)^2}-\frac{10a\sqrt{e}x}{d+ex^2}+\frac{ib\sqrt{d}\arcsin(cx)}{\left(\sqrt{d}+i\sqrt{e}x\right)^2}+\frac{ib\sqrt{d}\arcsin(cx)}{\left(i\sqrt{d}+\sqrt{e}x\right)^2}-\frac{5b\arcsin(cx)}{i\sqrt{d}+\sqrt{e}x}+\frac{6a\ldots}{}}{}$$

```
[In] Integrate[(x^4*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (((-I)*b*c*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2])/((c^2*d + e)*((-I)*Sqrt[d] +
Sqrt[e]*x)) + (I*b*c*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2])/((c^2*d + e)*(I*Sqr
t[d] + Sqrt[e]*x)) + (4*a*d*Sqrt[e]*x)/(d + e*x^2)^2 - (10*a*Sqrt[e]*x)/(d
+ e*x^2) + (I*b*Sqrt[d]*ArcSin[c*x])/(Sqrt[d] + I*Sqrt[e]*x)^2 + (I*b*Sqrt[
d]*ArcSin[c*x])/(I*Sqrt[d] + Sqrt[e]*x)^2 - (5*b*ArcSin[c*x])/(I*Sqrt[d] +
Sqrt[e]*x) + (6*a*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/Sqrt[d] - (5*I)*b*(ArcSin[c*
x]/(Sqrt[d] + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^
2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]) - (5*b*c*ArcTanh[(Sqrt[e] +
I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e] + ((
3*I)*b*ArcSin[c*x]*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqr
t[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*
d + e])]))/Sqrt[d] - ((3*I)*b*ArcSin[c*x]*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x
]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c
*Sqrt[d] + Sqrt[c^2*d + e])]))/Sqrt[d] + (b*c^3*d*(Log[4] + Log[(e*Sqrt[c^2
*d + e]*(Sqrt[e] - I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c
^3*(d + I*Sqrt[d]*Sqrt[e]*x))]))/(c^2*d + e)^(3/2) + (b*c^3*d*(Log[4] + Log
[(e*Sqrt[c^2*d + e]*(Sqrt[e] + I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c
^2*x^2]))/(c^3*(d - I*Sqrt[d]*Sqrt[e]*x))]))/(c^2*d + e)^(3/2) + (3*b*PolyL
og[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])])/Sqrt[d] -
 (3*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e
])])/Sqrt[d] - (3*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + S
qrt[c^2*d + e]))])/Sqrt[d] + (3*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c
*Sqrt[d] + Sqrt[c^2*d + e])])/Sqrt[d])/(16*e^(5/2))
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 9.73 (sec) , antiderivative size = 1748, normalized size of antiderivative = 1.62

method	result	size
derivativedivides	Expression too large to display	1748
default	Expression too large to display	1748
parts	Expression too large to display	1750

```
[In] int(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c^5*(a*c^6*((-5/8/e*c^3*x^3-3/8/e^2*d*c^3*x)/(c^2*e*x^2+c^2*d)^2+3/8/e^2/
c/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2)))+b*c^6*(-1/8*(3*arcsin(c*x)*d^2*c^5*x
+5*arcsin(c*x)*d*c^5*e*x^3-d^2*c^4*(-c^2*x^2+1)^(1/2)-(-c^2*x^2+1)^(1/2)*c^
4*d*e*x^2+3*arcsin(c*x)*c^3*d*e*x+5*arcsin(c*x)*e^2*c^3*x^3)/e^2/(c^2*d+e)/
(c^2*e*x^2+c^2*d)^2+1/2*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*(-2
*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*
e)*d*c^2*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))
^(1/2)+e)*e)^(1/2))/(c^2*d+e)^2/e^5-3/16/(c^2*d+e)/e^2*c^2*d*sum(1/_R1/(-_R
1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilo
g((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^
2+e))-3/16/(c^2*d+e)/e^2*c^2*d*sum(_R1/(-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*
ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))
/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+5/8*((2*c^2*d+2*(d*c^2*(c^
2*d+e))^(1/2)+e)*e)^(1/2)*(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2
*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^
2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/(c^2*d+e)^2/e^4-5/8*(-e*(2*c^2*d
-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*
arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)
*e)^(1/2))/(c^2*d+e)/e^4-1/2*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/
2)*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*c^2*d*arctan(e*(I*c*x+(-c^2*x^2+1)
^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/(c^2*d+e)/e^5-5/8
*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*(2*c^2*d-2*(d*c^2*(c^2*d+e
))^(1/2)+e)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+
e))^(1/2)+e)*e)^(1/2))/(c^2*d+e)/e^4+5/8*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(
1/2)+e))^(1/2)*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*
(c^2*d+e))^(1/2)*e)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2
*(c^2*d+e))^(1/2)-e)*e)^(1/2))/(c^2*d+e)^2/e^4-3/16/(c^2*d+e)/e*sum(1/_R1/(
-_R1^2*e+2*c^2*d+e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+d
ilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*
_Z^2+e))+1/2*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*(2*d^2*c^4+2*
(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)*d*c^2*ar
ctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e
)^(1/2))/(c^2*d+e)^2/e^5-3/16/(c^2*d+e)/e*sum(_R1/(-_R1^2*e+2*c^2*d+e)*(I*a
```

```
rcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^
2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-1/2*((2*c^2*d+2
*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)*
arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)
*e)^(1/2))*d*c^2/(c^2*d+e)/e^5))
```

Fricas [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{(b\arcsin{(cx)}+a)x^4}{(ex^2+d)^3}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arcsin(c*x) + a*x^4)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 +
 d^3), x)
```

Sympy [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{x^4(a+b\operatorname{asin}{(cx)})}{(d+ex^2)^3}\,dx$$

```
[In] integrate(x**4*(a+b*asin(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Integral(x**4*(a + b*asin(c*x))/(d + e*x**2)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{(b\arcsin(cx)+a)x^4}{(ex^2+d)^3}\,dx$$

```
[In] integrate(x^4*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*x^4/(e*x^2 + d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^4(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{x^4\,(a+b\,\mathrm{asin}(c\,x))}{(e\,x^2+d)^3}\,dx$$

```
[In] int((x^4*(a + b*asin(c*x)))/(d + e*x^2)^3,x)
[Out] int((x^4*(a + b*asin(c*x)))/(d + e*x^2)^3, x)
```

3.647 $\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 1092

$$\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e(c^2d+e)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e(c^2d+e)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2} - \frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)^2} + \frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{3/2}(c^2d+e)^{3/2}} + \frac{b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16de^{3/2}\sqrt{c^2d+e}} - \frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{3/2}(c^2d+e)^{3/2}} + \frac{b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16de^{3/2}\sqrt{c^2d+e}} - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}} - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}} + \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}} - \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}} + \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}} - \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}} + \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}}$$

```
[Out] -1/16*b*c^3*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1
)^(1/2))/e^(3/2)/(c^2*d+e)^(3/2)-1/16*b*c^3*arctanh((c^2*x*(-d)^(1/2)+e^(1/
```

```
2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/e^(3/2)/(c^2*d+e)^(3/2)-1/16*(a+b*a
rcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+
e)^(1/2)))/(-d)^(3/2)/e^(3/2)+1/16*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+
1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(3/2)-1/16
*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+
(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(3/2)+1/16*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c
^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(3/
2)+1/16*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c
^2*d+e)^(1/2)))/(-d)^(3/2)/e^(3/2)+1/16*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(
1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(3/2)-1/16*I*b
*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1
/2)))/(-d)^(3/2)/e^(3/2)-1/16*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(
1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(3/2)/e^(3/2)+1/16*(-a-b*arcsin
(c*x))/e^(3/2)/(-d)^(1/2)/((-d)^(1/2)-x*e^(1/2))^2+1/16*(-a-b*arcsin(c*x))/
d/e^(3/2)/((-d)^(1/2)-x*e^(1/2))+1/16*(a+b*arcsin(c*x))/e^(3/2)/(-d)^(1/2)/
((-d)^(1/2)+x*e^(1/2))^2+1/16*(a+b*arcsin(c*x))/d/e^(3/2)/((-d)^(1/2)+x*e^(
1/2))+1/16*b*c*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^
2+1)^(1/2))/d/e^(3/2)/(c^2*d+e)^(1/2)+1/16*b*c*arctanh((c^2*x*(-d)^(1/2)+e^
(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/d/e^(3/2)/(c^2*d+e)^(1/2)+1/16*b
*c*(-c^2*x^2+1)^(1/2)/e/(c^2*d+e)/(-d)^(1/2)/((-d)^(1/2)-x*e^(1/2))+1/16*b*
c*(-c^2*x^2+1)^(1/2)/e/(c^2*d+e)/(-d)^(1/2)/((-d)^(1/2)+x*e^(1/2))
```

Rubi [A] (verified)

Time = 1.73 (sec) , antiderivative size = 1092, normalized size of antiderivative = 1.00, number of steps used = 62, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.524$, Rules

used = {4817, 4757, 4827, 745, 739, 212, 4825, 4617, 2221, 2317, 2438}

$$\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = -\frac{b\,\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c^3}{16e^{3/2}(dc^2+e)^{3/2}} - \frac{b\,\text{arctanh}\left(\frac{\sqrt{-d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c^3}{16e^{3/2}(dc^2+e)^{3/2}} + \frac{b\,\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c}{16de^{3/2}\sqrt{dc^2+e}} + \frac{b\,\text{arctanh}\left(\frac{\sqrt{-d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c}{16de^{3/2}\sqrt{dc^2+e}} + \frac{b\sqrt{1-c^2x^2}c}{16\sqrt{-d}e(dc^2+e)(\sqrt{-d}-\sqrt{e}x)} + \frac{b\sqrt{1-c^2x^2}c}{16\sqrt{-d}e(dc^2+e)(\sqrt{e}x+\sqrt{-d})} - \frac{a+b\arcsin(cx)}{16de^{3/2}(\sqrt{-d}-\sqrt{e}x)} + \frac{a+b\arcsin(cx)}{16de^{3/2}(\sqrt{e}x+\sqrt{-d})} - \frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}(\sqrt{-d}-\sqrt{e}x)^2} + \frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}(\sqrt{e}x+\sqrt{-d})^2} - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{16(-d)^{3/2}e^{3/2}} + \frac{(a+b\arcsin(cx))\log\left(\frac{e^{i\arcsin(cx)}\sqrt{e}}{ic\sqrt{-d}-\sqrt{dc^2+e}}+1\right)}{16(-d)^{3/2}e^{3/2}} - \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{16(-d)^{3/2}e^{3/2}} + \frac{(a+b\arcsin(cx))\log\left(\frac{e^{i\arcsin(cx)}\sqrt{e}}{i\sqrt{-d}c+\sqrt{dc^2+e}}+1\right)}{16(-d)^{3/2}e^{3/2}} - \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{16(-d)^{3/2}e^{3/2}} + \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{16(-d)^{3/2}e^{3/2}} - \frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{16(-d)^{3/2}e^{3/2}} + \frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{16(-d)^{3/2}e^{3/2}}$$

```
[In] Int[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(16*Sqrt[-d]*e*(c^2*d + e)*(Sqrt[-d] - Sqrt[e]*x))
+ (b*c*Sqrt[1 - c^2*x^2])/(16*Sqrt[-d]*e*(c^2*d + e)*(Sqrt[-d] + Sqrt[e]*x)
) - (a + b*ArcSin[c*x])/(16*Sqrt[-d]*e^(3/2)*(Sqrt[-d] - Sqrt[e]*x)^2) - (a
```

```
 + b*ArcSin[c*x])/(16*d*e^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) + (a + b*ArcSin[c*x
])/(16*Sqrt[-d]*e^(3/2)*(Sqrt[-d] + Sqrt[e]*x)^2) + (a + b*ArcSin[c*x])/(16
*d*e^(3/2)*(Sqrt[-d] + Sqrt[e]*x)) - (b*c^3*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]
*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*e^(3/2)*(c^2*d + e)^(3/2)) +
(b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])
])/(16*d*e^(3/2)*Sqrt[c^2*d + e]) - (b*c^3*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*
x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*e^(3/2)*(c^2*d + e)^(3/2)) + (
b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])]
)/(16*d*e^(3/2)*Sqrt[c^2*d + e]) - ((a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^
(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*(-d)^(3/2)*e^(3/2))
 + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
 Sqrt[c^2*d + e])])/(16*(-d)^(3/2)*e^(3/2)) - ((a + b*ArcSin[c*x])*Log[1 -
(Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*(-d)^(3/
2)*e^(3/2)) + ((a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c
*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*(-d)^(3/2)*e^(3/2)) - ((I/16)*b*PolyLog[
2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/((-d)^
(3/2)*e^(3/2)) + ((I/16)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt
[-d] - Sqrt[c^2*d + e])])/((-d)^(3/2)*e^(3/2)) - ((I/16)*b*PolyLog[2, -((Sq
rt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/((-d)^(3/2)*e^
(3/2)) + ((I/16)*b*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + S
qrt[c^2*d + e])])/((-d)^(3/2)*e^(3/2))
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 745

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/((m + 1)*(c*d^2 + a*e^2))), x] + D
ist[c*(d/(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; F
reeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p + 3, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
```

```
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4817

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (
f*x)^m*(d + e*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[c^2*d +
 e, 0] && IGtQ[n, 0] && IntegerQ[p] && IntegerQ[m]
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
```

```
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\text{integral} = \int \left(-\frac{d(a+b\arcsin(cx))}{e\,(d+ex^2)^3}+\frac{a+b\arcsin(cx)}{e\,(d+ex^2)^2}\right)dx$$

$$= \frac{\int \frac{a+b\arcsin(cx)}{(d+ex^2)^2}\,dx}{e}-\frac{d\int \frac{a+b\arcsin(cx)}{(d+ex^2)^3}\,dx}{e}$$

$$= \frac{\int \left(-\frac{e(a+b\arcsin(cx))}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)^2}-\frac{e(a+b\arcsin(cx))}{4d\left(\sqrt{-d}\sqrt{e}+ex\right)^2}-\frac{e(a+b\arcsin(cx))}{2d(-de-e^2x^2)}\right)dx}{e}$$

$$-\frac{d\int \left(-\frac{e^{3/2}(a+b\arcsin(cx))}{8(-d)^{3/2}\left(\sqrt{-d}\sqrt{e}-ex\right)^3}-\frac{3e(a+b\arcsin(cx))}{16d^2\left(\sqrt{-d}\sqrt{e}-ex\right)^2}-\frac{e^{3/2}(a+b\arcsin(cx))}{8(-d)^{3/2}\left(\sqrt{-d}\sqrt{e}+ex\right)^3}-\frac{3e(a+b\arcsin(cx))}{16d^2\left(\sqrt{-d}\sqrt{e}+ex\right)^2}-\frac{3e(a+b\arcs}{8d^2(-de-}\right.}{e}$$

$$= \frac{3\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}\,dx}{16d}+\frac{3\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}\,dx}{16d}-\frac{\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}\,dx}{4d}-\frac{\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}\,dx}{4d}$$

$$+\frac{3\int \frac{a+b\arcsin(cx)}{-de-e^2x^2}\,dx}{8d}-\frac{\int \frac{a+b\arcsin(cx)}{-de-e^2x^2}\,dx}{2d}-\frac{\sqrt{e}\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^3}\,dx}{8\sqrt{-d}}-\frac{\sqrt{e}\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^3}\,dx}{8\sqrt{-d}}$$

$$= -\frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2}-\frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}$$

$$+\frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)^2}+\frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}$$

$$+\frac{3\int \left(-\frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}-\sqrt{e}x\right)}-\frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{8d}$$

$$-\frac{\int \left(-\frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}-\sqrt{e}x\right)}-\frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{2d}$$

$$-\frac{(3bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)\sqrt{1-c^2x^2}}\,dx}{16de}+\frac{(3bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)\sqrt{1-c^2x^2}}\,dx}{16de}$$

$$+\frac{(bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)\sqrt{1-c^2x^2}}\,dx}{4de}-\frac{(bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)\sqrt{1-c^2x^2}}\,dx}{4de}$$

$$+\frac{(bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2\sqrt{1-c^2x^2}}\,dx}{16\sqrt{-d}\sqrt{e}}-\frac{(bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2\sqrt{1-c^2x^2}}\,dx}{16\sqrt{-d}\sqrt{e}}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2} - \frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)^2} + \frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{3\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{16(-d)^{3/2}e} - \frac{3\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{16(-d)^{3/2}e} + \frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{4(-d)^{3/2}e} + \frac{\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{4(-d)^{3/2}e} + \frac{(3bc)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{-e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{16de} - \frac{(3bc)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{16de} - \frac{(bc)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{-e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{4de} + \frac{(bc)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{4de} - \frac{\left(bc^3\right)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)\sqrt{1-c^2x^2}}\,dx}{16e\left(c^2d+e\right)} + \frac{\left(bc^3\right)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)\sqrt{1-c^2x^2}}\,dx}{16e\left(c^2d+e\right)}$$

$$
\begin{aligned}
&= \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} \\
&\quad - \frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2} - \frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} \\
&\quad + \frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)^2} + \frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} \\
&\quad + \frac{b c\,\mathrm{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16de^{3/2}\sqrt{c^2d+e}} + \frac{b c\,\mathrm{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16de^{3/2}\sqrt{c^2d+e}} \\
&\quad - \frac{3\mathrm{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{16(-d)^{3/2}e} \\
&\quad - \frac{3\mathrm{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{16(-d)^{3/2}e} \\
&\quad + \frac{\mathrm{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{4(-d)^{3/2}e} \\
&\quad + \frac{\mathrm{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{4(-d)^{3/2}e} \\
&\quad + \frac{(bc^3)\,\mathrm{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{-e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{16e\left(c^2d+e\right)} \\
&\quad - \frac{(bc^3)\,\mathrm{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{16e\left(c^2d+e\right)}
\end{aligned}
$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$-\frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2}-\frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}$$
$$+\frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)^2}+\frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$-\frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{3/2}\left(c^2d+e\right)^{3/2}}+\frac{b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16de^{3/2}\sqrt{c^2d+e}}$$
$$-\frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{3/2}\left(c^2d+e\right)^{3/2}}+\frac{b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16de^{3/2}\sqrt{c^2d+e}}$$
$$-\frac{(3i)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{16(-d)^{3/2}e}$$
$$-\frac{(3i)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{16(-d)^{3/2}e}$$
$$-\frac{(3i)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{16(-d)^{3/2}e}$$
$$-\frac{(3i)\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{16(-d)^{3/2}e}$$
$$+\frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{4(-d)^{3/2}e}$$
$$+\frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{4(-d)^{3/2}e}$$
$$+\frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{4(-d)^{3/2}e}$$
$$+\frac{i\text{Subst}\left(\int\frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{4(-d)^{3/2}e}$$

$$=\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$-\frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2}-\frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}$$
$$+\frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)^2}+\frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$-\frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{3/2}\left(c^2d+e\right)^{3/2}}+\frac{b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16de^{3/2}\sqrt{c^2d+e}}$$
$$-\frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{3/2}\left(c^2d+e\right)^{3/2}}+\frac{b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16de^{3/2}\sqrt{c^2d+e}}$$
$$-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}}$$
$$+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}}$$
$$-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}}$$
$$+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}}$$
$$-\frac{(3b)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{16(-d)^{3/2}e^{3/2}}$$
$$+\frac{(3b)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{16(-d)^{3/2}e^{3/2}}$$
$$-\frac{(3b)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{16(-d)^{3/2}e^{3/2}}$$
$$+\frac{(3b)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{16(-d)^{3/2}e^{3/2}}$$
$$+\frac{b\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4(-d)^{3/2}e^{3/2}}$$
$$-\frac{b\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4(-d)^{3/2}e^{3/2}}$$
$$+\frac{b\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4(-d)^{3/2}e^{3/2}}$$
$$-\frac{b\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)dx,x,\arcsin(cx)\right)}{4(-d)^{3/2}e^{3/2}}$$

$$
\begin{aligned}
&= \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} \\
&- \frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2} - \frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} \\
&+ \frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)^2} + \frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} \\
&- \frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{3/2}\left(c^2d+e\right)^{3/2}} + \frac{b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16de^{3/2}\sqrt{c^2d+e}} \\
&- \frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{3/2}\left(c^2d+e\right)^{3/2}} + \frac{b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16de^{3/2}\sqrt{c^2d+e}} \\
&- \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}} \\
&+ \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}} \\
&- \frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}} \\
&+ \frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}} \\
&+ \frac{(3ib)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{16(-d)^{3/2}e^{3/2}} \\
&- \frac{(3ib)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{16(-d)^{3/2}e^{3/2}} \\
&+ \frac{(3ib)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{16(-d)^{3/2}e^{3/2}} \\
&- \frac{(3ib)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{16(-d)^{3/2}e^{3/2}} \\
&- \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{4(-d)^{3/2}e^{3/2}} \\
&+ \frac{(ib)\text{Subst}\left(\int \frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)}{4(-d)^{3/2}e^{3/2}} \\
&\quad (ib)\text{Subst}\left(\int \frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}\,dx, x, e^{i\arcsin(cx)}\right)
\end{aligned}
$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{bc\sqrt{1-c^2x^2}}{16\sqrt{-d}e\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$-\frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2}-\frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}$$
$$+\frac{a+b\arcsin(cx)}{16\sqrt{-d}e^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)^2}+\frac{a+b\arcsin(cx)}{16de^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$-\frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{3/2}\left(c^2d+e\right)^{3/2}}+\frac{b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16de^{3/2}\sqrt{c^2d+e}}$$
$$-\frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16e^{3/2}\left(c^2d+e\right)^{3/2}}+\frac{b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16de^{3/2}\sqrt{c^2d+e}}$$
$$-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}}$$
$$+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}}$$
$$-\frac{(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}}$$
$$+\frac{(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}}$$
$$-\frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}}+\frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}}$$
$$-\frac{ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}}+\frac{ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{3/2}e^{3/2}}$$

Mathematica [A] (warning: unable to verify)

Time = 4.64 (sec) , antiderivative size = 1014, normalized size of antiderivative = 0.93

$$\int \frac{x^2(a+b\arcsin(cx))}{\left(d+ex^2\right)^3}\,dx$$

$$= \frac{\frac{2ibc\sqrt{e}\sqrt{1-c^2x^2}}{\sqrt{d}(c^2d+e)\left(-i\sqrt{d}+\sqrt{e}x\right)}-\frac{2ibc\sqrt{e}\sqrt{1-c^2x^2}}{\sqrt{d}(c^2d+e)\left(i\sqrt{d}+\sqrt{e}x\right)}-\frac{8a\sqrt{e}x}{(d+ex^2)^2}+\frac{4a\sqrt{e}x}{d^2+dex^2}+\frac{2ib\arcsin(cx)}{\sqrt{d}\left(\sqrt{d}-i\sqrt{e}x\right)^2}-\frac{2ib\arcsin(cx)}{\sqrt{d}\left(\sqrt{d}+i\sqrt{e}x\right)^2}+\frac{4a\arctan\left(\cdots\right)}{d^{3/2}}}{}$$

```
[In] Integrate[(x^2*(a + b*ArcSin[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (((2*I)*b*c*Sqrt[e]*Sqrt[1 - c^2*x^2])/(Sqrt[d]*(c^2*d + e)*((-I)*Sqrt[d] +
 Sqrt[e]*x)) - ((2*I)*b*c*Sqrt[e]*Sqrt[1 - c^2*x^2])/(Sqrt[d]*(c^2*d + e)*(
I*Sqrt[d] + Sqrt[e]*x)) - (8*a*Sqrt[e]*x)/(d + e*x^2)^2 + (4*a*Sqrt[e]*x)/(
d^2 + d*e*x^2) + ((2*I)*b*ArcSin[c*x])/(Sqrt[d]*(Sqrt[d] - I*Sqrt[e]*x)^2)
- ((2*I)*b*ArcSin[c*x])/(Sqrt[d]*(Sqrt[d] + I*Sqrt[e]*x)^2) + (4*a*ArcTan[(
Sqrt[e]*x)/Sqrt[d]])/d^(3/2) + ((2*I)*b*(ArcSin[c*x]/(Sqrt[d] + I*Sqrt[e]*x
) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2
])])/Sqrt[c^2*d + e]))/d + (2*b*(ArcSin[c*x]/(I*Sqrt[d] + Sqrt[e]*x) + (c*A
rcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/Sq
rt[c^2*d + e]))/d - (2*b*c^3*(Log[4] + Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] - I*
c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d + I*Sqrt[d]*Sqr
t[e]*x))]))/(c^2*d + e)^(3/2) - (2*b*c^3*(Log[4] + Log[(e*Sqrt[c^2*d + e]*(
Sqrt[e] + I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2]))/(c^3*(d - I
*Sqrt[d]*Sqrt[e]*x))]))/(c^2*d + e)^(3/2) - (b*(ArcSin[c*x]*(ArcSin[c*x] +
(2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] +
 Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*P
olyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2
*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]))
/d^(3/2) + (b*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcS
in[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[
c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin
[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[
c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])]))/d^(3/2))/(32*e^(3/2))
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 5.11 (sec) , antiderivative size = 1224, normalized size of antiderivative = 1.12

method	result	size
parts	Expression too large to display	1224
derivativedivides	Expression too large to display	1231
default	Expression too large to display	1231

```
[In] int(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] a*((1/8/d*x^3-1/8/e*x)/(e*x^2+d)^2+1/8/e/d/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/
2)))+b/c^3*(1/8*c^4*(arcsin(c*x)*d*c^5*e*x^3-arcsin(c*x)*d^2*c^5*x-(-c^2*x^
2+1)^(1/2)*c^4*d*e*x^2-d^2*c^4*(-c^2*x^2+1)^(1/2)+arcsin(c*x)*e^2*c^3*x^3-a
rcsin(c*x)*c^3*d*e*x)/e/d/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2-1/8*(-e*(2*c^2*d-2*
(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^
2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)*c^4*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/
2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/(c^2*d+e)^2/d/e^3+1/8
*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*(2*c^2*d+2*(d*c^2*(c^2*d+
```

```
e))^(1/2)+e)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d
+e))^(1/2)-e)*e)^(1/2))*c^4/(c^2*d+e)/d/e^3-1/8*((2*c^2*d+2*(d*c^2*(c^2*d+e
))^(1/2)+e)*e)^(1/2)*(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-
(d*c^2*(c^2*d+e))^(1/2)*e)*c^4*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2
*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/(c^2*d+e)^2/d/e^3+1/8*((2*c^2*d+2
*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)*
arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)
*e)^(1/2))*c^4/(c^2*d+e)/d/e^3+1/16/(c^2*d+e)/d*c^4*sum(1/_R1/(_R1^2*e-2*c^
2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c
*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/16
/(c^2*d+e)/d*c^4*sum(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(
-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=Root
Of(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/16/(c^2*d+e)/e*c^6*sum(1/_R1/(_R1^2*e-2
*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-
I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1
/16/(c^2*d+e)/e*c^6*sum(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*
x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=R
ootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e)))
```

Fricas [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx=\int \frac{(b\arcsin{(cx)}+a)x^2}{(ex^2+d)^3}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
[Out] integral((b*x^2*arcsin(c*x) + a*x^2)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 +
 d^3), x)
```

Sympy [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx=\int \frac{x^2(a+b\operatorname{asin}{(cx)})}{(d+ex^2)^3}\,dx$$

```
[In] integrate(x**2*(a+b*asin(c*x))/(e*x**2+d)**3,x)
[Out] Integral(x**2*(a + b*asin(c*x))/(d + e*x**2)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{(b\arcsin(cx)+a)x^2}{(ex^2+d)^3}\,dx$$

```
[In] integrate(x^2*(a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)*x^2/(e*x^2 + d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{x^2(a+b\arcsin(cx))}{(d+ex^2)^3}\,dx = \int \frac{x^2\,(a+b\,\mathrm{asin}(c\,x))}{(e\,x^2+d)^3}\,dx$$

```
[In] int((x^2*(a + b*asin(c*x)))/(d + e*x^2)^3,x)
```

```
[Out] int((x^2*(a + b*asin(c*x)))/(d + e*x^2)^3, x)
```

3.648 $\int \frac{a+b \arcsin(cx)}{\left(d+ex^2\right)^3} \, dx$

Optimal result

Integrand size = 18, antiderivative size = 1092

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^3}\,dx = \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)^2} - \frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)^2} + \frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{bc^3\operatorname{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d\sqrt{e}\left(c^2d+e\right)^{3/2}} + \frac{3bc\operatorname{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d^2\sqrt{e}\sqrt{c^2d+e}} + \frac{bc^3\operatorname{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d\sqrt{e}\left(c^2d+e\right)^{3/2}} + \frac{3bc\operatorname{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d^2\sqrt{e}\sqrt{c^2d+e}} + \frac{3(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}} - \frac{3(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}} + \frac{3(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}} - \frac{3(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}} + \frac{3ib\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}} - \frac{3ib\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}} + \frac{3ib\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}} - \frac{3ib\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}}$$

```
[Out] 1/16*b*c^3*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)
^(1/2))/d/(c^2*d+e)^(3/2)/e^(1/2)+1/16*b*c^3*arctanh((c^2*x*(-d)^(1/2)+e^(1
/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/d/(c^2*d+e)^(3/2)/e^(1/2)+3/16*(a+
b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2
*d+e)^(1/2)))/(-d)^(5/2)/e^(1/2)-3/16*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x
^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(5/2)/e^(1/2)+3
/16*(a+b*arcsin(c*x))*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/
2)+(c^2*d+e)^(1/2)))/(-d)^(5/2)/e^(1/2)-3/16*(a+b*arcsin(c*x))*ln(1+(I*c*x+
```

```
(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(5/2)/e^
(1/2)+3/16*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2
)-(c^2*d+e)^(1/2)))/(-d)^(5/2)/e^(1/2)-3/16*I*b*polylog(2,(I*c*x+(-c^2*x^2+
1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(5/2)/e^(1/2)-3/16
*I*b*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)
^(1/2)))/(-d)^(5/2)/e^(1/2)+3/16*I*b*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))*
e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(5/2)/e^(1/2)+1/16*(-a-b*arc
sin(c*x))/(-d)^(3/2)/e^(1/2)/((-d)^(1/2)-x*e^(1/2))^2-3/16*(a+b*arcsin(c*x)
)/d^2/e^(1/2)/((-d)^(1/2)-x*e^(1/2))+1/16*(a+b*arcsin(c*x))/(-d)^(3/2)/e^(1
/2)/((-d)^(1/2)+x*e^(1/2))^2+3/16*(a+b*arcsin(c*x))/d^2/e^(1/2)/((-d)^(1/2)
+x*e^(1/2))+3/16*b*c*arctanh((-c^2*x*(-d)^(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-
c^2*x^2+1)^(1/2))/d^2/e^(1/2)/(c^2*d+e)^(1/2)+3/16*b*c*arctanh((c^2*x*(-d)^
(1/2)+e^(1/2))/(c^2*d+e)^(1/2)/(-c^2*x^2+1)^(1/2))/d^2/e^(1/2)/(c^2*d+e)^(1
/2)+1/16*b*c*(-c^2*x^2+1)^(1/2)/(-d)^(3/2)/(c^2*d+e)/((-d)^(1/2)-x*e^(1/2))
+1/16*b*c*(-c^2*x^2+1)^(1/2)/(-d)^(3/2)/(c^2*d+e)/((-d)^(1/2)+x*e^(1/2))
```

Rubi [A] (verified)

Time = 0.85 (sec) , antiderivative size = 1092, normalized size of antiderivative = 1.00, number of steps used = 34, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.556$, Rules

used = {4757, 4827, 745, 739, 212, 4825, 4617, 2221, 2317, 2438}

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^3}\,dx = \frac{b\,\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c^3}{16d\sqrt{e}\,(dc^2+e)^{3/2}} + \frac{b\,\text{arctanh}\left(\frac{\sqrt{-d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c^3}{16d\sqrt{e}\,(dc^2+e)^{3/2}} + \frac{3b\,\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c}{16d^2\sqrt{e}\sqrt{dc^2+e}} + \frac{3b\,\text{arctanh}\left(\frac{\sqrt{-d}xc^2+\sqrt{e}}{\sqrt{dc^2+e}\sqrt{1-c^2x^2}}\right)c}{16d^2\sqrt{e}\sqrt{dc^2+e}} + \frac{b\sqrt{1-c^2x^2}c}{16(-d)^{3/2}(dc^2+e)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{b\sqrt{1-c^2x^2}c}{16(-d)^{3/2}(dc^2+e)\left(\sqrt{e}x+\sqrt{-d}\right)} - \frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{e}x+\sqrt{-d}\right)} - \frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)^2} + \frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{e}x+\sqrt{-d}\right)^2} + \frac{3(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{16(-d)^{5/2}\sqrt{e}} - \frac{3(a+b\arcsin(cx))\log\left(\frac{e^{i\arcsin(cx)}\sqrt{e}}{ic\sqrt{-d}-\sqrt{dc^2+e}}+1\right)}{16(-d)^{5/2}\sqrt{e}} + \frac{3(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{16(-d)^{5/2}\sqrt{e}} - \frac{3(a+b\arcsin(cx))\log\left(\frac{e^{i\arcsin(cx)}\sqrt{e}}{i\sqrt{-d}c+\sqrt{dc^2+e}}+1\right)}{16(-d)^{5/2}\sqrt{e}} + \frac{3ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{16(-d)^{5/2}\sqrt{e}} - \frac{3ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{16(-d)^{5/2}\sqrt{e}} + \frac{3ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{16(-d)^{5/2}\sqrt{e}} - \frac{3ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{16(-d)^{5/2}\sqrt{e}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^3,x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(16*(-d)^(3/2)*(c^2*d + e)*(Sqrt[-d] - Sqrt[e]*x))
+ (b*c*Sqrt[1 - c^2*x^2])/(16*(-d)^(3/2)*(c^2*d + e)*(Sqrt[-d] + Sqrt[e]*x)
) - (a + b*ArcSin[c*x])/(16*(-d)^(3/2)*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)^2) -
(3*(a + b*ArcSin[c*x]))/(16*d^2*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)) + (a + b*Ar
cSin[c*x])/(16*(-d)^(3/2)*Sqrt[e]*(Sqrt[-d] + Sqrt[e]*x)^2) + (3*(a + b*Arc
Sin[c*x]))/(16*d^2*Sqrt[e]*(Sqrt[-d] + Sqrt[e]*x)) + (b*c^3*ArcTanh[(Sqrt[e
] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*d*Sqrt[e]*(c^
2*d + e)^(3/2)) + (3*b*c*ArcTanh[(Sqrt[e] - c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e
```

```
]*Sqrt[1 - c^2*x^2])])/(16*d^2*Sqrt[e]*Sqrt[c^2*d + e]) + (b*c^3*ArcTanh[(S
qrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^2])])/(16*d*Sqrt[e
]*(c^2*d + e)^(3/2)) + (3*b*c*ArcTanh[(Sqrt[e] + c^2*Sqrt[-d]*x)/(Sqrt[c^2*
d + e]*Sqrt[1 - c^2*x^2])])/(16*d^2*Sqrt[e]*Sqrt[c^2*d + e]) + (3*(a + b*Ar
cSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d +
 e])])/(16*(-d)^(5/2)*Sqrt[e]) - (3*(a + b*ArcSin[c*x])*Log[1 + (Sqrt[e]*E^
(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(16*(-d)^(5/2)*Sqrt[e])
 + (3*(a + b*ArcSin[c*x])*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d]
 + Sqrt[c^2*d + e])])/(16*(-d)^(5/2)*Sqrt[e]) - (3*(a + b*ArcSin[c*x])*Log[
1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(16*(-d)
^(5/2)*Sqrt[e]) + (((3*I)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/((-d)^(5/2)*Sqrt[e]) - (((3*I)/16)*b*Poly
Log[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/((-d)
^(5/2)*Sqrt[e]) + (((3*I)/16)*b*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/((-d)^(5/2)*Sqrt[e]) - (((3*I)/16)*b*Poly
Log[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/((-d)
^(5/2)*Sqrt[e])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 739

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 745

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
e*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/((m + 1)*(c*d^2 + a*e^2))), x] + D
ist[c*(d/(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; F
reeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p + 3, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 4827

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Dist[b*c*(n/(e*(m + 1))), Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1
)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
&& NeQ[m, -1]
```

Rubi steps

$$\text{integral} = \int \left(-\frac{e^{3/2}(a+b\arcsin(cx))}{8(-d)^{3/2}\left(\sqrt{-d}\sqrt{e}-ex\right)^3}-\frac{3e(a+b\arcsin(cx))}{16d^2\left(\sqrt{-d}\sqrt{e}-ex\right)^2}-\frac{e^{3/2}(a+b\arcsin(cx))}{8(-d)^{3/2}\left(\sqrt{-d}\sqrt{e}+ex\right)^3}-\frac{3e(a+b\arcsin(cx))}{16d^2\left(\sqrt{-d}\sqrt{e}+ex\right)^2}-\frac{3e(a+b\arcsin(cx))}{8d^2\left(-de-e^2x^2\right)}\right)dx$$

$$= -\frac{(3e)\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}\,dx}{16d^2} - \frac{(3e)\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}\,dx}{16d^2} - \frac{(3e)\int \frac{a+b\arcsin(cx)}{-de-e^2x^2}\,dx}{8d^2} - \frac{e^{3/2}\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}-ex\right)^3}\,dx}{8(-d)^{3/2}} - \frac{e^{3/2}\int \frac{a+b\arcsin(cx)}{\left(\sqrt{-d}\sqrt{e}+ex\right)^3}\,dx}{8(-d)^{3/2}}$$

$$= -\frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)^2} - \frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)^2} + \frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{(3bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)\sqrt{1-c^2x^2}}\,dx}{16d^2} - \frac{(3bc)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)\sqrt{1-c^2x^2}}\,dx}{16d^2} + \frac{\left(bc\sqrt{e}\right)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2\sqrt{1-c^2x^2}}\,dx}{16(-d)^{3/2}} - \frac{\left(bc\sqrt{e}\right)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2\sqrt{1-c^2x^2}}\,dx}{16(-d)^{3/2}} - \frac{(3e)\int \left(-\frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{-d}(a+b\arcsin(cx))}{2de\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{8d^2}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)^2} - \frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)^2} + \frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{3\int \frac{a+b\arcsin(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{16(-d)^{5/2}} - \frac{3\int \frac{a+b\arcsin(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{16(-d)^{5/2}} - \frac{(3bc)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{-e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{16d^2} + \frac{(3bc)\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{16d^2} + \frac{(bc^3)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}-ex\right)\sqrt{1-c^2x^2}}\,dx}{16d\left(c^2d+e\right)} - \frac{(bc^3)\int \frac{1}{\left(\sqrt{-d}\sqrt{e}+ex\right)\sqrt{1-c^2x^2}}\,dx}{16d\left(c^2d+e\right)}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$- \frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)^2} - \frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}$$
$$+ \frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)^2} + \frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$+ \frac{3b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d^2\sqrt{e}\sqrt{c^2d+e}} + \frac{3b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d^2\sqrt{e}\sqrt{c^2d+e}}$$
$$- \frac{3\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{16(-d)^{5/2}}$$
$$- \frac{3\text{Subst}\left(\int \frac{(a+bx)\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx, x, \arcsin(cx)\right)}{16(-d)^{5/2}}$$
$$- \frac{(bc^3)\,\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{-e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{16d\left(c^2d+e\right)}$$
$$+ \frac{(bc^3)\,\text{Subst}\left(\int \frac{1}{c^2de+e^2-x^2}\,dx, x, \frac{e+c^2\sqrt{-d}\sqrt{e}x}{\sqrt{1-c^2x^2}}\right)}{16d\left(c^2d+e\right)}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}(c^2d+e)\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$- \frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)^2} - \frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}$$
$$+ \frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)^2} + \frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$+ \frac{bc^3\operatorname{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d\sqrt{e}\,(c^2d+e)^{3/2}} + \frac{3b\text{carctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d^2\sqrt{e}\sqrt{c^2d+e}}$$
$$+ \frac{bc^3\operatorname{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d\sqrt{e}\,(c^2d+e)^{3/2}} + \frac{3b\text{carctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d^2\sqrt{e}\sqrt{c^2d+e}}$$
$$- \frac{(3i)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{16(-d)^{5/2}}$$
$$- \frac{(3i)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{16(-d)^{5/2}}$$
$$- \frac{(3i)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{16(-d)^{5/2}}$$
$$- \frac{(3i)\text{Subst}\left(\int \frac{e^{ix}(a+bx)}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx, x, \arcsin(cx)\right)}{16(-d)^{5/2}}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$-\frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)^2}-\frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}$$
$$+\frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)^2}+\frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$+\frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d\sqrt{e}\left(c^2d+e\right)^{3/2}}+\frac{3bc\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d^2\sqrt{e}\sqrt{c^2d+e}}$$
$$+\frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d\sqrt{e}\left(c^2d+e\right)^{3/2}}+\frac{3bc\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d^2\sqrt{e}\sqrt{c^2d+e}}$$
$$+\frac{3(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}}$$
$$-\frac{3(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}}$$
$$+\frac{3(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}}$$
$$-\frac{3(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}}$$
$$-\frac{(3b)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{16(-d)^{5/2}\sqrt{e}}$$
$$+\frac{(3b)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{16(-d)^{5/2}\sqrt{e}}$$
$$-\frac{(3b)\text{Subst}\left(\int\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{16(-d)^{5/2}\sqrt{e}}$$
$$+\frac{(3b)\text{Subst}\left(\int\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{16(-d)^{5/2}\sqrt{e}}$$

$$
\begin{aligned}
&= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)} \\
&\quad -\frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)^2}-\frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)} \\
&\quad +\frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)^2}+\frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)} \\
&\quad +\frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d\sqrt{e}\left(c^2d+e\right)^{3/2}}+\frac{3bc\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d^2\sqrt{e}\sqrt{c^2d+e}} \\
&\quad +\frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d\sqrt{e}\left(c^2d+e\right)^{3/2}}+\frac{3bc\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d^2\sqrt{e}\sqrt{c^2d+e}} \\
&\quad +\frac{3(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}} \\
&\quad -\frac{3(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}} \\
&\quad +\frac{3(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}} \\
&\quad -\frac{3(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}} \\
&\quad +\frac{(3ib)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{16(-d)^{5/2}\sqrt{e}} \\
&\quad -\frac{(3ib)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{16(-d)^{5/2}\sqrt{e}} \\
&\quad +\frac{(3ib)\text{Subst}\left(\int\frac{\log\left(1-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{16(-d)^{5/2}\sqrt{e}} \\
&\quad -\frac{(3ib)\text{Subst}\left(\int\frac{\log\left(1+\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{16(-d)^{5/2}\sqrt{e}}
\end{aligned}
$$

$$= \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{bc\sqrt{1-c^2x^2}}{16(-d)^{3/2}\left(c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$- \frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)^2} - \frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}$$
$$+ \frac{a+b\arcsin(cx)}{16(-d)^{3/2}\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)^2} + \frac{3(a+b\arcsin(cx))}{16d^2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}$$
$$+ \frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d\sqrt{e}\left(c^2d+e\right)^{3/2}} + \frac{3bc\text{arctanh}\left(\frac{\sqrt{e}-c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d^2\sqrt{e}\sqrt{c^2d+e}}$$
$$+ \frac{bc^3\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d\sqrt{e}\left(c^2d+e\right)^{3/2}} + \frac{3bc\text{arctanh}\left(\frac{\sqrt{e}+c^2\sqrt{-d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{16d^2\sqrt{e}\sqrt{c^2d+e}}$$
$$+ \frac{3(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}}$$
$$- \frac{3(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}}$$
$$+ \frac{3(a+b\arcsin(cx))\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}}$$
$$- \frac{3(a+b\arcsin(cx))\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}}$$
$$+ \frac{3ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}} - \frac{3ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}}$$
$$+ \frac{3ib\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}} - \frac{3ib\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{16(-d)^{5/2}\sqrt{e}}$$

Mathematica [A] (warning: unable to verify)

Time = 6.06 (sec) , antiderivative size = 1055, normalized size of antiderivative = 0.97

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^3}\,dx = \frac{ax}{4d(d+ex^2)^2}+\frac{3ax}{8d^2(d+ex^2)}+\frac{3a\arctan\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{8d^{5/2}\sqrt{e}} + b\left(\frac{3i\left(\frac{\arcsin(cx)}{\sqrt{d}+i\sqrt{e}x}-\frac{c\arctan\left(\frac{i\sqrt{e}+c^2\sqrt{d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right)}{16d^2\sqrt{e}}-\frac{3\left(-\frac{\arcsin(cx)}{i\sqrt{d}+\sqrt{e}x}-\frac{c\,\text{arctanh}\left(\frac{\sqrt{e}+ic^2\sqrt{d}x}{\sqrt{c^2d+e}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d+e}}\right)}{16d^2\sqrt{e}}\right.$$
$$+\frac{i\left(-\frac{c\sqrt{1-c^2x^2}}{(c^2d+e)\left(-i\sqrt{d}+\sqrt{e}x\right)}-\frac{\arcsin(cx)}{\sqrt{e}\left(-i\sqrt{d}+\sqrt{e}x\right)^2}-\frac{ic^3\sqrt{d}\left(\log(4)+\log\left(\frac{e\sqrt{c^2d+e}\left(\sqrt{e}-ic^2\sqrt{d}x+\sqrt{c^2d+e}\sqrt{1-c^2x^2}\right)}{c^3\left(d+i\sqrt{d}\sqrt{e}x\right)}\right)\right)}{\sqrt{e}(c^2d+e)^{3/2}}\right)}{16d^{3/2}}$$
$$-\frac{i\left(-\frac{c\sqrt{1-c^2x^2}}{(c^2d+e)\left(i\sqrt{d}+\sqrt{e}x\right)}-\frac{\arcsin(cx)}{\sqrt{e}\left(i\sqrt{d}+\sqrt{e}x\right)^2}+\frac{ic^3\sqrt{d}\left(\log(4)+\log\left(\frac{e\sqrt{c^2d+e}\left(\sqrt{e}+ic^2\sqrt{d}x+\sqrt{c^2d+e}\sqrt{1-c^2x^2}\right)}{c^3\left(d-i\sqrt{d}\sqrt{e}x\right)}\right)\right)}{\sqrt{e}(c^2d+e)^{3/2}}\right)}{16d^{3/2}}$$
$$-\frac{3\left(\arcsin(cx)\left(\arcsin(cx)+2i\left(\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{c\sqrt{d}-\sqrt{c^2d+e}}\right)+\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\,\text{a}}}{-c\sqrt{d}+}\right.\right.}{32d^{5/2}\sqrt{e}}$$
$$+\frac{3\left(\arcsin(cx)\left(\arcsin(cx)+2i\left(\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{-c\sqrt{d}+\sqrt{c^2d+e}}\right)+\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{c\sqrt{d}+\sqrt{c^2d+e}}\right)\right)\right)+2\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i}}{c\sqrt{d}-}\right.\right.}{32d^{5/2}\sqrt{e}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^3,x]
```

```
[Out] (a*x)/(4*d*(d + e*x^2)^2) + (3*a*x)/(8*d^2*(d + e*x^2)) + (3*a*ArcTan[(Sqrt
[e]*x)/Sqrt[d]])/(8*d^(5/2)*Sqrt[e]) + b*((((3*I)/16)*(ArcSin[c*x]/(Sqrt[d]
 + I*Sqrt[e]*x) - (c*ArcTan[(I*Sqrt[e] + c^2*Sqrt[d]*x)/(Sqrt[c^2*d + e]*Sq
rt[1 - c^2*x^2])])/Sqrt[c^2*d + e]))/(d^2*Sqrt[e]) - (3*(-(ArcSin[c*x]/(I*S
qrt[d] + Sqrt[e]*x)) - (c*ArcTanh[(Sqrt[e] + I*c^2*Sqrt[d]*x)/(Sqrt[c^2*d +
 e]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d + e]))/(16*d^2*Sqrt[e]) + ((I/16)*(-((c
*Sqrt[1 - c^2*x^2])/((c^2*d + e)*((-I)*Sqrt[d] + Sqrt[e]*x))) - ArcSin[c*x]
/(Sqrt[e]*((-I)*Sqrt[d] + Sqrt[e]*x)^2) - (I*c^3*Sqrt[d]*(Log[4] + Log[(e*S
qrt[c^2*d + e]*(Sqrt[e] - I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqrt[1 - c^2*x^
```

```
2]))/(c^3*(d + I*Sqrt[d]*Sqrt[e]*x))]))/(Sqrt[e]*(c^2*d + e)^(3/2))))/d^(3/
2) - ((I/16)*(-((c*Sqrt[1 - c^2*x^2])/((c^2*d + e)*(I*Sqrt[d] + Sqrt[e]*x))
) - ArcSin[c*x]/(Sqrt[e]*(I*Sqrt[d] + Sqrt[e]*x)^2) + (I*c^3*Sqrt[d]*(Log[4
] + Log[(e*Sqrt[c^2*d + e]*(Sqrt[e] + I*c^2*Sqrt[d]*x + Sqrt[c^2*d + e]*Sqr
t[1 - c^2*x^2]))/(c^3*(d - I*Sqrt[d]*Sqrt[e]*x))]))/(Sqrt[e]*(c^2*d + e)^(3
/2))))/d^(3/2) - (3*(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(
I*ArcSin[c*x]))/(c*Sqrt[d] - Sqrt[c^2*d + e])] + Log[1 + (Sqrt[e]*E^(I*ArcS
in[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*Arc
Sin[c*x]))/(-(c*Sqrt[d]) + Sqrt[c^2*d + e])] + 2*PolyLog[2, -((Sqrt[e]*E^(I
*ArcSin[c*x]))/(c*Sqrt[d] + Sqrt[c^2*d + e]))]))/(32*d^(5/2)*Sqrt[e]) + (3*
(ArcSin[c*x]*(ArcSin[c*x] + (2*I)*(Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(-(c
*Sqrt[d]) + Sqrt[c^2*d + e])] + Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt
[d] + Sqrt[c^2*d + e])])) + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqr
t[d] - Sqrt[c^2*d + e])] + 2*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(c*Sqrt
[d] + Sqrt[c^2*d + e])]))/(32*d^(5/2)*Sqrt[e]))
```

Maple [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 5.07 (sec) , antiderivative size = 1772, normalized size of antiderivative = 1.62

method	result	size
parts	Expression too large to display	1772
derivativedivides	Expression too large to display	1793
default	Expression too large to display	1793

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*a*x/d/(e*x^2+d)^2+3/8*a/d^2*x/(e*x^2+d)+3/8*a/d^2/(d*e)^(1/2)*arctan(e*
x/(d*e)^(1/2))+b/c*(1/8*c^2*(5*arcsin(c*x)*d^2*c^5*x+3*arcsin(c*x)*d*c^5*e*
x^3+d^2*c^4*(-c^2*x^2+1)^(1/2)+(-c^2*x^2+1)^(1/2)*c^4*d*e*x^2+5*arcsin(c*x)
*c^3*d*e*x+3*arcsin(c*x)*e^2*c^3*x^3)/d^2/(c^2*d+e)/(c^2*e*x^2+c^2*d)^2+1/2
*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*(2*c^2*d-2*(d*c^2*(c^2*d+e
))^(1/2)+e)*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+
e))^(1/2)+e)*e)^(1/2))*c^4/(c^2*d+e)/d/e^3-1/2*((2*c^2*d+2*(d*c^2*(c^2*d+e)
)^(1/2)+e)*e)^(1/2)*(-2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(
d*c^2*(c^2*d+e))^(1/2)*e)*c^4*arctanh(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*
d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/(c^2*d+e)^2/d/e^3+3/16/(c^2*d+e)/d
^2*c^2*e*sum(1/_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x
^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_
Z^4+(-4*c^2*d-2*e)*_Z^2+e))+1/2*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^
(1/2)*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*arctan(e*(I*c*x+(-c^2*x^2+1)^(1
/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))*c^4/(c^2*d+e)/d/e^3-
3/8*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2)*(-2*(d*c^2*(c^2*d+e))^(
```

```
1/2)*d*c^2+2*d^2*c^4+2*c^2*e*d-(d*c^2*(c^2*d+e))^(1/2)*e)*c^2*arctanh(e*(I*
c*x+(-c^2*x^2+1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/(c
^2*d+e)^2/d^2/e^2-1/2*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*(2*d
^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*(c^2*d+e))^(1/2)*e)
*c^4*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/
2)-e)*e)^(1/2))/(c^2*d+e)^2/d/e^3+3/16/(c^2*d+e)/d*c^4*sum(1/_R1/(_R1^2*e-2
*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-
I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))+3
/16/(c^2*d+e)/d*c^4*sum(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_R1-I*c*
x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)),_R1=R
ootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e))-3/8*(-e*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(
1/2)+e))^(1/2)*(2*d^2*c^4+2*(d*c^2*(c^2*d+e))^(1/2)*d*c^2+2*c^2*e*d+(d*c^2*
(c^2*d+e))^(1/2)*e)*c^2*arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d
*c^2*(c^2*d+e))^(1/2)-e)*e)^(1/2))/(c^2*d+e)^2/d^2/e^2+3/8*(-e*(2*c^2*d-2*(
d*c^2*(c^2*d+e))^(1/2)+e))^(1/2)*(2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*c^2*
arctan(e*(I*c*x+(-c^2*x^2+1)^(1/2))/((-2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)-e)
*e)^(1/2))/(c^2*d+e)/d^2/e^2+3/8*((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^
(1/2)*(2*c^2*d-2*(d*c^2*(c^2*d+e))^(1/2)+e)*c^2*arctanh(e*(I*c*x+(-c^2*x^2+
1)^(1/2))/((2*c^2*d+2*(d*c^2*(c^2*d+e))^(1/2)+e)*e)^(1/2))/(c^2*d+e)/d^2/e^
2+3/16/(c^2*d+e)/d^2*c^2*e*sum(_R1/(_R1^2*e-2*c^2*d-e)*(I*arcsin(c*x)*ln((_
R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-I*c*x-(-c^2*x^2+1)^(1/2))/_R1)
),_R1=RootOf(e*_Z^4+(-4*c^2*d-2*e)*_Z^2+e)))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^3}\,dx=\int \frac{b\arcsin(cx)+a}{(ex^2+d)^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^3), x
)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^3}\,dx=\int \frac{a+b\operatorname{asin}(cx)}{(d+ex^2)^3}\,dx$$

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**3,x)
[Out] Integral((a + b*asin(c*x))/(d + e*x**2)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^3}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^3}\,dx = \int \frac{b\arcsin(cx)+a}{(ex^2+d)^3}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^3}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{(e\,x^2+d)^3}\,dx$$

```
[In] int((a + b*asin(c*x))/(d + e*x^2)^3,x)
```

```
[Out] int((a + b*asin(c*x))/(d + e*x^2)^3, x)
```

3.649 $\int \sqrt{d+ex^2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 20, antiderivative size = 20

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))\,dx = \text{Int}\left(\sqrt{d+ex^2}(a+b\arcsin(cx)),x\right)$$

```
[Out] Unintegrable((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.01 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))\,dx = \int \sqrt{d+ex^2}(a+b\arcsin(cx))\,dx$$

```
[In] Int[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x]),x]
[Out] Defer[Int][Sqrt[d + e*x^2]*(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\text{integral} = \int \sqrt{d+ex^2}(a+b\arcsin(cx))\,dx$$

Mathematica [N/A]

Not integrable

Time = 6.60 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))\,dx = \int \sqrt{d+ex^2}(a+b\arcsin(cx))\,dx$$

```
[In] Integrate[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x]),x]
[Out] Integrate[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.02 (sec) , antiderivative size = 18, normalized size of antiderivative = 0.90

$$\int \sqrt{e\,x^2+d}\,(a+b\arcsin(cx))\,dx$$

```
[In] int((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
[Out] int((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))\,dx = \int \sqrt{ex^2+d}(b\arcsin(cx)+a)\,dx$$

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a), x)
```

Sympy [N/A]

Not integrable

Time = 9.71 (sec) , antiderivative size = 19, normalized size of antiderivative = 0.95

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))\,dx = \int (a+b\operatorname{asin}(cx))\sqrt{d+ex^2}\,dx$$

```
[In] integrate((e*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
[Out] Integral((a + b*asin(c*x))*sqrt(d + e*x**2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [N/A]

Not integrable

Time = 0.50 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))\,dx = \int \sqrt{ex^2+d}(b\arcsin{(cx)}+a)\,dx$$

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a), x)
```

Mupad [N/A]

Not integrable

Time = 0.44 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\sqrt{e\,x^2+d}\,dx$$

```
[In] int((a + b*asin(c*x))*(d + e*x^2)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))*(d + e*x^2)^(1/2), x)
```

3.650 $\int \frac{a+b\arcsin(cx)}{\sqrt{d+ex^2}}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 20

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+ex^2}}\,dx=\text{Int}\left(\frac{a+b\arcsin(cx)}{\sqrt{d+ex^2}},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.01 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+ex^2}}\,dx=\int \frac{a+b\arcsin(cx)}{\sqrt{d+ex^2}}\,dx$$

```
[In] Int[(a + b*ArcSin[c*x])/Sqrt[d + e*x^2],x]
```

```
[Out] Defer[Int][(a + b*ArcSin[c*x])/Sqrt[d + e*x^2], x]
```

Rubi steps

$$\text{integral}=\int \frac{a+b\arcsin(cx)}{\sqrt{d+ex^2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 3.23 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+ex^2}}\,dx=\int \frac{a+b\arcsin(cx)}{\sqrt{d+ex^2}}\,dx$$

```
[In] Integrate[(a + b*ArcSin[c*x])/Sqrt[d + e*x^2],x]
[Out] Integrate[(a + b*ArcSin[c*x])/Sqrt[d + e*x^2], x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.27 (sec) , antiderivative size = 18, normalized size of antiderivative = 0.90

$$\int \frac{a+b\arcsin\left(cx\right)}{\sqrt{e\,x^{2}+d}}dx$$

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x)
[Out] int((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+ex^2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\sqrt{ex^2+d}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)/sqrt(e*x^2 + d), x)
```

Sympy [N/A]

Not integrable

Time = 2.88 (sec) , antiderivative size = 19, normalized size of antiderivative = 0.95

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+ex^2}}\,dx=\int \frac{a+b\,\mathrm{asin}\left(cx\right)}{\sqrt{d+ex^2}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**(1/2),x)
[Out] Integral((a + b*asin(c*x))/sqrt(d + e*x**2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b\arcsin(cx)}{\sqrt{d + ex^2}}\, dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00

$$\int \frac{a + b\arcsin(cx)}{\sqrt{d + ex^2}}\, dx = \int \frac{b\arcsin{(cx)} + a}{\sqrt{ex^2 + d}}\, dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/sqrt(e*x^2 + d), x)
```

Mupad [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00

$$\int \frac{a + b\arcsin(cx)}{\sqrt{d + ex^2}}\, dx = \int \frac{a + b\,\mathrm{asin}(c\,x)}{\sqrt{e\,x^2 + d}}\, dx$$

```
[In] int((a + b*asin(c*x))/(d + e*x^2)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))/(d + e*x^2)^(1/2), x)
```

3.651 $\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{3/2}}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 70

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{3/2}}\,dx=\frac{x(a+b\arcsin(cx))}{d\sqrt{d+ex^2}}+\frac{b\arctan\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{d\sqrt{e}}$$

```
[Out] b*arctan(e^(1/2)*(-c^2*x^2+1)^(1/2)/c/(e*x^2+d)^(1/2))/d/e^(1/2)+x*(a+b*arc
sin(c*x))/d/(e*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {197, 4755, 12, 455, 65, 223, 209}

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{3/2}}\,dx=\frac{x(a+b\arcsin(cx))}{d\sqrt{d+ex^2}}+\frac{b\arctan\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{d\sqrt{e}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcSin[c*x]))/(d*Sqrt[d + e*x^2]) + (b*ArcTan[(Sqrt[e]*Sqrt[1 - c
^2*x^2])/(c*Sqrt[d + e*x^2])])/(d*Sqrt[e])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 223

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 455

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4755

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x(a+b\arcsin(cx))}{d\sqrt{d+ex^2}} - (bc)\int \frac{x}{d\sqrt{1-c^2x^2}\sqrt{d+ex^2}}\,dx \\
&= \frac{x(a+b\arcsin(cx))}{d\sqrt{d+ex^2}} - \frac{(bc)\int \frac{x}{\sqrt{1-c^2x^2}\sqrt{d+ex^2}}\,dx}{d} \\
&= \frac{x(a+b\arcsin(cx))}{d\sqrt{d+ex^2}} - \frac{(bc)\text{Subst}\left(\int \frac{1}{\sqrt{1-c^2x}\sqrt{d+ex}}\,dx, x, x^2\right)}{2d}
\end{aligned}$$

$$= \frac{x(a+b\arcsin(cx))}{d\sqrt{d+ex^2}} + \frac{b\text{Subst}\left(\int \frac{1}{\sqrt{d+\frac{e}{c^2}-\frac{ex^2}{c^2}}}\,dx, x, \sqrt{1-c^2x^2}\right)}{cd}$$

$$= \frac{x(a+b\arcsin(cx))}{d\sqrt{d+ex^2}} + \frac{b\text{Subst}\left(\int \frac{1}{1+\frac{ex^2}{c^2}}\,dx, x, \frac{\sqrt{1-c^2x^2}}{\sqrt{d+ex^2}}\right)}{cd}$$

$$= \frac{x(a+b\arcsin(cx))}{d\sqrt{d+ex^2}} + \frac{b\arctan\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{d\sqrt{e}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 6 vs. order 3 in optimal.

Time = 0.09 (sec) , antiderivative size = 74, normalized size of antiderivative = 1.06

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{3/2}}\,dx = \frac{x\left(-bcx\sqrt{1+\frac{ex^2}{d}}\,\text{AppellF1}\left(1,\frac{1}{2},\frac{1}{2},2,c^2x^2,-\frac{ex^2}{d}\right)+2(a+b\arcsin(cx))\right)}{2d\sqrt{d+ex^2}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^(3/2),x]
[Out] (x*(-(b*c*x*Sqrt[1 + (e*x^2)/d]*AppellF1[1, 1/2, 1/2, 2, c^2*x^2, -((e*x^2)
/d)]) + 2*(a + b*ArcSin[c*x])))/(2*d*Sqrt[d + e*x^2])
```

Maple [F]

$$\int \frac{a+b\arcsin(cx)}{(e\,x^2+d)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x)
[Out] int((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 137 vs. 2(60) = 120.

Time = 0.28 (sec) , antiderivative size = 294, normalized size of antiderivative = 4.20

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{3/2}}\,dx = \left[-\frac{(bex^2+bd)\sqrt{-e}\log\left(8\,c^4e^2x^4+c^4d^2-6\,c^2de+8\,(c^4de-c^2e^2)x^2+4\,(2\,c^3ex^2+\right.}{4\,(de^2x}\right.$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [-1/4*((b*e*x^2 + b*d)*sqrt(-e)*log(8*c^4*e^2*x^4 + c^4*d^2 - 6*c^2*d*e + 8
*(c^4*d*e - c^2*e^2)*x^2 + 4*(2*c^3*e*x^2 + c^3*d - c*e)*sqrt(-c^2*x^2 + 1)
*sqrt(e*x^2 + d)*sqrt(-e) + e^2) - 4*(b*e*x*arcsin(c*x) + a*e*x)*sqrt(e*x^2
 + d))/(d*e^2*x^2 + d^2*e), 1/2*((b*e*x^2 + b*d)*sqrt(e)*arctan(1/2*(2*c^2*
e*x^2 + c^2*d - e)*sqrt(-c^2*x^2 + 1)*sqrt(e*x^2 + d)*sqrt(e)/(c^3*e^2*x^4
- c*d*e + (c^3*d*e - c*e^2)*x^2)) + 2*(b*e*x*arcsin(c*x) + a*e*x)*sqrt(e*x^
2 + d))/(d*e^2*x^2 + d^2*e)]
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{3/2}}\,dx = \int \frac{a+b\operatorname{asin}(cx)}{(d+ex^2)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))/(d + e*x**2)**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e+c^2*d>0)', see `assume?` for more
 detail
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{3/2}}\,dx = \int \frac{b\arcsin(cx)+a}{(ex^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{3/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{(e\,x^2+d)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(d + e*x^2)^(3/2),x)
[Out] int((a + b*asin(c*x))/(d + e*x^2)^(3/2), x)
```

3.652 $\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{5/2}}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 146

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{5/2}}\,dx = \frac{bc\sqrt{1-c^2x^2}}{3d\,(c^2d+e)\,\sqrt{d+ex^2}} + \frac{x(a+b\arcsin(cx))}{3d\,(d+ex^2)^{3/2}} + \frac{2x(a+b\arcsin(cx))}{3d^2\sqrt{d+ex^2}} + \frac{2b\arctan\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{3d^2\sqrt{e}}$$

```
[Out] 1/3*x*(a+b*arcsin(c*x))/d/(e*x^2+d)^(3/2)+2/3*b*arctan(e^(1/2)*(-c^2*x^2+1)
^(1/2)/c/(e*x^2+d)^(1/2))/d^2/e^(1/2)+2/3*x*(a+b*arcsin(c*x))/d^2/(e*x^2+d)
^(1/2)+1/3*b*c*(-c^2*x^2+1)^(1/2)/d/(c^2*d+e)/(e*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.450, Rules used = {198, 197, 4755, 12, 585, 79, 65, 223, 209}

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{5/2}}\,dx = \frac{2x(a+b\arcsin(cx))}{3d^2\sqrt{d+ex^2}} + \frac{x(a+b\arcsin(cx))}{3d\,(d+ex^2)^{3/2}} + \frac{2b\arctan\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{3d^2\sqrt{e}} + \frac{bc\sqrt{1-c^2x^2}}{3d\,(c^2d+e)\,\sqrt{d+ex^2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(3*d*(c^2*d + e)*Sqrt[d + e*x^2]) + (x*(a + b*ArcSi
n[c*x]))/(3*d*(d + e*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x]))/(3*d^2*Sqrt[d
```

```
+ e*x^2]) + (2*b*ArcTan[(Sqrt[e]*Sqrt[1 - c^2*x^2])/(c*Sqrt[d + e*x^2])])/(
3*d^2*Sqrt[e])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(-(b*e - a*f))*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/
(f*(p + 1)*(c*f - d*e))), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c
*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x]
, x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || I
ntegerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))
))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 223

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 585

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
)*((e_) + (f_.)*(x_)^(n_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x
)^p*(c + d*x)^q*(e + f*x)^r, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m,
 n, p, q, r}, x] && EqQ[m - n + 1, 0]
```

Rule 4755

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{x(a+b\arcsin(cx))}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x(a+b\arcsin(cx))}{3d^2\sqrt{d+ex^2}}-(bc)\int\frac{x\left(3d+2ex^2\right)}{3d^2\sqrt{1-c^2x^2}\left(d+ex^2\right)^{3/2}}\,dx\\
&= \frac{x(a+b\arcsin(cx))}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x(a+b\arcsin(cx))}{3d^2\sqrt{d+ex^2}}-\frac{(bc)\int\frac{x\left(3d+2ex^2\right)}{\sqrt{1-c^2x^2}\left(d+ex^2\right)^{3/2}}\,dx}{3d^2}\\
&= \frac{x(a+b\arcsin(cx))}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x(a+b\arcsin(cx))}{3d^2\sqrt{d+ex^2}}-\frac{(bc)\text{Subst}\left(\int\frac{3d+2ex}{\sqrt{1-c^2x}(d+ex)^{3/2}}\,dx,x,x^2\right)}{6d^2}\\
&= \frac{bc\sqrt{1-c^2x^2}}{3d\left(c^2d+e\right)\sqrt{d+ex^2}}+\frac{x(a+b\arcsin(cx))}{3d\left(d+ex^2\right)^{3/2}}\\
&\quad+\frac{2x(a+b\arcsin(cx))}{3d^2\sqrt{d+ex^2}}-\frac{(bc)\text{Subst}\left(\int\frac{1}{\sqrt{1-c^2x}\sqrt{d+ex}}\,dx,x,x^2\right)}{3d^2}\\
&= \frac{bc\sqrt{1-c^2x^2}}{3d\left(c^2d+e\right)\sqrt{d+ex^2}}+\frac{x(a+b\arcsin(cx))}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x(a+b\arcsin(cx))}{3d^2\sqrt{d+ex^2}}\\
&\quad+\frac{(2b)\text{Subst}\left(\int\frac{1}{\sqrt{d+\frac{e}{c^2}-\frac{ex^2}{c^2}}}\,dx,x,\sqrt{1-c^2x^2}\right)}{3cd^2}\\
&= \frac{bc\sqrt{1-c^2x^2}}{3d\left(c^2d+e\right)\sqrt{d+ex^2}}+\frac{x(a+b\arcsin(cx))}{3d\left(d+ex^2\right)^{3/2}}\\
&\quad+\frac{2x(a+b\arcsin(cx))}{3d^2\sqrt{d+ex^2}}+\frac{(2b)\text{Subst}\left(\int\frac{1}{1+\frac{ex^2}{c^2}}\,dx,x,\frac{\sqrt{1-c^2x^2}}{\sqrt{d+ex^2}}\right)}{3cd^2}\\
&= \frac{bc\sqrt{1-c^2x^2}}{3d\left(c^2d+e\right)\sqrt{d+ex^2}}+\frac{x(a+b\arcsin(cx))}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x(a+b\arcsin(cx))}{3d^2\sqrt{d+ex^2}}+\frac{2b\arctan\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{3d^2\sqrt{e}}
\end{aligned}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 6 vs. order 3 in optimal.

Time = 0.19 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.30

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{5/2}}\,dx = \frac{bc\sqrt{1-c^2x^2}}{3d\,(c^2d+e)\sqrt{d+ex^2}} + \sqrt{d+ex^2}\left(\frac{ax}{3d\,(d+ex^2)^2}+\frac{2ax}{3d^2\,(d+ex^2)}\right) - \frac{bcx^2\sqrt{\frac{d+ex^2}{d}}\,\text{AppellF1}\left(1,\frac{1}{2},\frac{1}{2},2,c^2x^2,-\frac{ex^2}{d}\right)}{3d^2\sqrt{d+ex^2}} + \frac{bx(3d+2ex^2)\arcsin(cx)}{3d^2\,(d+ex^2)^{3/2}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(3*d*(c^2*d + e)*Sqrt[d + e*x^2]) + Sqrt[d + e*x^2]
*((a*x)/(3*d*(d + e*x^2)^2) + (2*a*x)/(3*d^2*(d + e*x^2))) - (b*c*x^2*Sqrt[
(d + e*x^2)/d]*AppellF1[1, 1/2, 1/2, 2, c^2*x^2, -((e*x^2)/d)])/(3*d^2*Sqrt
[d + e*x^2]) + (b*x*(3*d + 2*e*x^2)*ArcSin[c*x])/(3*d^2*(d + e*x^2)^(3/2))
```

Maple [F]

$$\int \frac{a+b\arcsin(cx)}{(e\,x^2+d)^{\frac{5}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 331 vs. 2(122) = 244.

Time = 0.31 (sec) , antiderivative size = 683, normalized size of antiderivative = 4.68

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{5/2}}\,dx = \left[-\frac{(bc^2d^3+(bc^2de^2+be^3)x^4+bd^2e+2\,(bc^2d^2e+bde^2)x^2)\sqrt{-e}\log\left(8\,c^4e^2x^4+c^4d\right.}{}\right.$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [-1/6*((b*c^2*d^3 + (b*c^2*d*e^2 + b*e^3)*x^4 + b*d^2*e + 2*(b*c^2*d^2*e +
b*d*e^2)*x^2)*sqrt(-e)*log(8*c^4*e^2*x^4 + c^4*d^2 - 6*c^2*d*e + 8*(c^4*d*e
 - c^2*e^2)*x^2 + 4*(2*c^3*e*x^2 + c^3*d - c*e)*sqrt(-c^2*x^2 + 1)*sqrt(e*x
^2 + d)*sqrt(-e) + e^2) - 2*(2*(a*c^2*d*e^2 + a*e^3)*x^3 + 3*(a*c^2*d^2*e +
```

```
 a*d*e^2)*x + (2*(b*c^2*d*e^2 + b*e^3)*x^3 + 3*(b*c^2*d^2*e + b*d*e^2)*x)*a
rcsin(c*x) + (b*c*d*e^2*x^2 + b*c*d^2*e)*sqrt(-c^2*x^2 + 1))*sqrt(e*x^2 + d
))/(c^2*d^5*e + d^4*e^2 + (c^2*d^3*e^3 + d^2*e^4)*x^4 + 2*(c^2*d^4*e^2 + d^
3*e^3)*x^2), 1/3*((b*c^2*d^3 + (b*c^2*d*e^2 + b*e^3)*x^4 + b*d^2*e + 2*(b*c
^2*d^2*e + b*d*e^2)*x^2)*sqrt(e)*arctan(1/2*(2*c^2*e*x^2 + c^2*d - e)*sqrt(
-c^2*x^2 + 1)*sqrt(e*x^2 + d)*sqrt(e)/(c^3*e^2*x^4 - c*d*e + (c^3*d*e - c*e
^2)*x^2)) + (2*(a*c^2*d*e^2 + a*e^3)*x^3 + 3*(a*c^2*d^2*e + a*d*e^2)*x + (2
*(b*c^2*d*e^2 + b*e^3)*x^3 + 3*(b*c^2*d^2*e + b*d*e^2)*x)*arcsin(c*x) + (b*
c*d*e^2*x^2 + b*c*d^2*e)*sqrt(-c^2*x^2 + 1))*sqrt(e*x^2 + d))/(c^2*d^5*e +
d^4*e^2 + (c^2*d^3*e^3 + d^2*e^4)*x^4 + 2*(c^2*d^4*e^2 + d^3*e^3)*x^2)]
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{5/2}}\,dx=\int \frac{a+b\,\mathrm{asin}\,(cx)}{(d+ex^2)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**(5/2),x)
[Out] Integral((a + b*asin(c*x))/(d + e*x**2)**(5/2), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{5/2}}\,dx=\int \frac{b\arcsin\,(cx)+a}{(ex^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x, algorithm="maxima")
[Out] 1/3*a*(2*x/(sqrt(e*x^2 + d)*d^2) + x/((e*x^2 + d)^(3/2)*d)) + b*integrate(a
rctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((e^2*x^4 + 2*d*e*x^2 + d^2)*sqrt
(e*x^2 + d)), x)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{5/2}}\,dx=\int \frac{b\arcsin\,(cx)+a}{(ex^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{5/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{(e\,x^2+d)^{5/2}}\,dx$$

```
[In] int((a + b*asin(c*x))/(d + e*x^2)^(5/2),x)
[Out] int((a + b*asin(c*x))/(d + e*x^2)^(5/2), x)
```

3.653 $\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{7/2}}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 226

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{7/2}}\,dx = \frac{bc\sqrt{1-c^2x^2}}{15d\,(c^2d+e)\,(d+ex^2)^{3/2}} + \frac{2bc(3c^2d+2e)\sqrt{1-c^2x^2}}{15d^2\,(c^2d+e)^2\sqrt{d+ex^2}} + \frac{x(a+b\arcsin(cx))}{5d\,(d+ex^2)^{5/2}} + \frac{4x(a+b\arcsin(cx))}{15d^2\,(d+ex^2)^{3/2}} + \frac{8x(a+b\arcsin(cx))}{15d^3\sqrt{d+ex^2}} + \frac{8b\arctan\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{15d^3\sqrt{e}}$$

```
[Out] 1/5*x*(a+b*arcsin(c*x))/d/(e*x^2+d)^(5/2)+4/15*x*(a+b*arcsin(c*x))/d^2/(e*x
^2+d)^(3/2)+8/15*b*arctan(e^(1/2)*(-c^2*x^2+1)^(1/2)/c/(e*x^2+d)^(1/2))/d^3
/e^(1/2)+1/15*b*c*(-c^2*x^2+1)^(1/2)/d/(c^2*d+e)/(e*x^2+d)^(3/2)+8/15*x*(a+
b*arcsin(c*x))/d^3/(e*x^2+d)^(1/2)+2/15*b*c*(3*c^2*d+2*e)*(-c^2*x^2+1)^(1/2
)/d^2/(c^2*d+e)^2/(e*x^2+d)^(1/2)
```

Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 226, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used

= {198, 197, 4755, 12, 6847, 963, 79, 65, 223, 209}

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{7/2}}\,dx = \frac{8x(a+b\arcsin(cx))}{15d^3\sqrt{d+ex^2}} + \frac{4x(a+b\arcsin(cx))}{15d^2(d+ex^2)^{3/2}} + \frac{x(a+b\arcsin(cx))}{5d(d+ex^2)^{5/2}} + \frac{8b\arctan\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{15d^3\sqrt{e}} + \frac{2bc\sqrt{1-c^2x^2}(3c^2d+2e)}{15d^2(c^2d+e)^2\sqrt{d+ex^2}} + \frac{bc\sqrt{1-c^2x^2}}{15d(c^2d+e)(d+ex^2)^{3/2}}$$

```
[In] Int[(a + b*ArcSin[c*x])/(d + e*x^2)^(7/2),x]
```

```
[Out] (b*c*Sqrt[1 - c^2*x^2])/(15*d*(c^2*d + e)*(d + e*x^2)^(3/2)) + (2*b*c*(3*c^
2*d + 2*e)*Sqrt[1 - c^2*x^2])/(15*d^2*(c^2*d + e)^2*Sqrt[d + e*x^2]) + (x*(
a + b*ArcSin[c*x]))/(5*d*(d + e*x^2)^(5/2)) + (4*x*(a + b*ArcSin[c*x]))/(15
*d^2*(d + e*x^2)^(3/2)) + (8*x*(a + b*ArcSin[c*x]))/(15*d^3*Sqrt[d + e*x^2]
) + (8*b*ArcTan[(Sqrt[e]*Sqrt[1 - c^2*x^2])/(c*Sqrt[d + e*x^2])])/(15*d^3*S
qrt[e])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 79

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(-(b*e - a*f))*(c + d*x)^(n + 1)*((e + f*x)^(p + 1)/
(f*(p + 1)*(c*f - d*e))), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c
*f*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x]
, x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || I
ntegerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))
))
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 198

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1],
0] && NeQ[p, -1]
```

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 223

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 963

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x
 + c*x^2)^p, d + e*x, x], R = PolynomialRemainder[(a + b*x + c*x^2)^p, d +
e*x, x]}, Simp[R*(d + e*x)^(m + 1)*((f + g*x)^(n + 1)/((m + 1)*(e*f - d*g))
), x] + Dist[1/((m + 1)*(e*f - d*g)), Int[(d + e*x)^(m + 1)*(f + g*x)^n*Exp
andToSum[(m + 1)*(e*f - d*g)*Qx - g*R*(m + n + 2), x], x], x]] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c
*d^2 - b*d*e + a*e^2, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 4755

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(p_.), x_Symbo
l] :> With[{u = IntHide[(d + e*x^2)^p, x]}, Dist[a + b*ArcSin[c*x], u, x] -
 Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d + e, 0] && (IGtQ[p, 0] || ILtQ[p + 1/2, 0]
)
```

Rule 6847

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\text{integral} = \frac{x(a+b\arcsin(cx))}{5d\left(d+ex^2\right)^{5/2}}+\frac{4x(a+b\arcsin(cx))}{15d^2\left(d+ex^2\right)^{3/2}}+\frac{8x(a+b\arcsin(cx))}{15d^3\sqrt{d+ex^2}}-(bc)\int\frac{x\left(15d^2+20dex^2+8e^2x^4\right)}{15d^3\sqrt{1-c^2x^2}\left(d+ex^2\right)^{5/2}}\,dx$$

$$=\frac{x(a+b\arcsin(cx))}{5d\left(d+ex^2\right)^{5/2}}+\frac{4x(a+b\arcsin(cx))}{15d^2\left(d+ex^2\right)^{3/2}}+\frac{8x(a+b\arcsin(cx))}{15d^3\sqrt{d+ex^2}}-\frac{(bc)\int\frac{x\left(15d^2+20dex^2+8e^2x^4\right)}{\sqrt{1-c^2x^2}\left(d+ex^2\right)^{5/2}}\,dx}{15d^3}$$

$$=\frac{x(a+b\arcsin(cx))}{5d\left(d+ex^2\right)^{5/2}}+\frac{4x(a+b\arcsin(cx))}{15d^2\left(d+ex^2\right)^{3/2}}+\frac{8x(a+b\arcsin(cx))}{15d^3\sqrt{d+ex^2}}-\frac{(bc)\text{Subst}\left(\int\frac{15d^2+20dex+8e^2x^2}{\sqrt{1-c^2x}(d+ex)^{5/2}}\,dx,x,x^2\right)}{30d^3}$$

$$=\frac{bc\sqrt{1-c^2x^2}}{15d\left(c^2d+e\right)\left(d+ex^2\right)^{3/2}}+\frac{x(a+b\arcsin(cx))}{5d\left(d+ex^2\right)^{5/2}}+\frac{4x(a+b\arcsin(cx))}{15d^2\left(d+ex^2\right)^{3/2}}+\frac{8x(a+b\arcsin(cx))}{15d^3\sqrt{d+ex^2}}+\frac{(bc)\text{Subst}\left(\int\frac{-3d(7c^2d+6e)-12e(c^2d+e)x}{\sqrt{1-c^2x}(d+ex)^{3/2}}\,dx,x,x^2\right)}{45d^3\left(c^2d+e\right)}$$

$$=\frac{bc\sqrt{1-c^2x^2}}{15d\left(c^2d+e\right)\left(d+ex^2\right)^{3/2}}+\frac{2bc(3c^2d+2e)\sqrt{1-c^2x^2}}{15d^2\left(c^2d+e\right)^2\sqrt{d+ex^2}}+\frac{x(a+b\arcsin(cx))}{5d\left(d+ex^2\right)^{5/2}}+\frac{4x(a+b\arcsin(cx))}{15d^2\left(d+ex^2\right)^{3/2}}+\frac{8x(a+b\arcsin(cx))}{15d^3\sqrt{d+ex^2}}-\frac{(4bc)\text{Subst}\left(\int\frac{1}{\sqrt{1-c^2x}\sqrt{d+ex}}\,dx,x,x^2\right)}{15d^3}$$

$$=\frac{bc\sqrt{1-c^2x^2}}{15d\left(c^2d+e\right)\left(d+ex^2\right)^{3/2}}+\frac{2bc(3c^2d+2e)\sqrt{1-c^2x^2}}{15d^2\left(c^2d+e\right)^2\sqrt{d+ex^2}}+\frac{x(a+b\arcsin(cx))}{5d\left(d+ex^2\right)^{5/2}}+\frac{4x(a+b\arcsin(cx))}{15d^2\left(d+ex^2\right)^{3/2}}+\frac{8x(a+b\arcsin(cx))}{15d^3\sqrt{d+ex^2}}+\frac{(8b)\text{Subst}\left(\int\frac{1}{\sqrt{d+\frac{e}{c^2}-\frac{ex^2}{c^2}}}\,dx,x,\sqrt{1-c^2x^2}\right)}{15cd^3}$$

$$=\frac{bc\sqrt{1-c^2x^2}}{15d\left(c^2d+e\right)\left(d+ex^2\right)^{3/2}}+\frac{2bc(3c^2d+2e)\sqrt{1-c^2x^2}}{15d^2\left(c^2d+e\right)^2\sqrt{d+ex^2}}+\frac{x(a+b\arcsin(cx))}{5d\left(d+ex^2\right)^{5/2}}+\frac{4x(a+b\arcsin(cx))}{15d^2\left(d+ex^2\right)^{3/2}}+\frac{8x(a+b\arcsin(cx))}{15d^3\sqrt{d+ex^2}}+\frac{(8b)\text{Subst}\left(\int\frac{1}{1+\frac{ex^2}{c^2}}\,dx,x,\frac{\sqrt{1-c^2x^2}}{\sqrt{d+ex^2}}\right)}{15cd^3}$$

$$= \frac{bc\sqrt{1-c^2x^2}}{15d\,(c^2d+e)\,(d+ex^2)^{3/2}} + \frac{2bc(3c^2d+2e)\sqrt{1-c^2x^2}}{15d^2\,(c^2d+e)^2\sqrt{d+ex^2}} + \frac{x(a+b\arcsin(cx))}{5d\,(d+ex^2)^{5/2}} + \frac{4x(a+b\arcsin(cx))}{15d^2\,(d+ex^2)^{3/2}} + \frac{8x(a+b\arcsin(cx))}{15d^3\sqrt{d+ex^2}} + \frac{8b\arctan\left(\frac{\sqrt{e}\sqrt{1-c^2x^2}}{c\sqrt{d+ex^2}}\right)}{15d^3\sqrt{e}}$$

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 6 vs. order 3 in optimal.

Time = 0.31 (sec) , antiderivative size = 188, normalized size of antiderivative = 0.83

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{7/2}}\,dx = \frac{ax(15d^2+20dex^2+8e^2x^4) + \frac{bcd\sqrt{1-c^2x^2}(d+ex^2)\left(e(5d+4ex^2)+c^2d(7d+6ex^2)\right)}{(c^2d+e)^2} - 4bcx^2(d+ex^2)\cdots}{15d^3\,(d\cdots}$$

```
[In] Integrate[(a + b*ArcSin[c*x])/(d + e*x^2)^(7/2),x]
```

```
[Out] (a*x*(15*d^2 + 20*d*e*x^2 + 8*e^2*x^4) + (b*c*d*Sqrt[1 - c^2*x^2]*(d + e*x^
2)*(e*(5*d + 4*e*x^2) + c^2*d*(7*d + 6*e*x^2)))/(c^2*d + e)^2 - 4*b*c*x^2*(
d + e*x^2)^2*Sqrt[1 + (e*x^2)/d]*AppellF1[1, 1/2, 1/2, 2, c^2*x^2, -((e*x^2
)/d)] + b*x*(15*d^2 + 20*d*e*x^2 + 8*e^2*x^4)*ArcSin[c*x])/(15*d^3*(d + e*x
^2)^(5/2))
```

Maple [F]

$$\int \frac{a+b\arcsin(cx)}{(e\,x^2+d)^{\frac{7}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x)
```

```
[Out] int((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 650 vs. 2(192) = 384.

Time = 0.37 (sec) , antiderivative size = 1321, normalized size of antiderivative = 5.85

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{7/2}}\,dx = \text{Too large to display}$$

```
[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x, algorithm="fricas")
```

```
[Out] [-1/15*(2*(b*c^4*d^5 + 2*b*c^2*d^4*e + (b*c^4*d^2*e^3 + 2*b*c^2*d*e^4 + b*e
^5)*x^6 + b*d^3*e^2 + 3*(b*c^4*d^3*e^2 + 2*b*c^2*d^2*e^3 + b*d*e^4)*x^4 + 3
```

```
*(b*c^4*d^4*e + 2*b*c^2*d^3*e^2 + b*d^2*e^3)*x^2)*sqrt(-e)*log(8*c^4*e^2*x^
4 + c^4*d^2 - 6*c^2*d*e + 8*(c^4*d*e - c^2*e^2)*x^2 + 4*(2*c^3*e*x^2 + c^3*
d - c*e)*sqrt(-c^2*x^2 + 1)*sqrt(e*x^2 + d)*sqrt(-e) + e^2) - (8*(a*c^4*d^2
*e^3 + 2*a*c^2*d*e^4 + a*e^5)*x^5 + 20*(a*c^4*d^3*e^2 + 2*a*c^2*d^2*e^3 + a
*d*e^4)*x^3 + 15*(a*c^4*d^4*e + 2*a*c^2*d^3*e^2 + a*d^2*e^3)*x + (8*(b*c^4*
d^2*e^3 + 2*b*c^2*d*e^4 + b*e^5)*x^5 + 20*(b*c^4*d^3*e^2 + 2*b*c^2*d^2*e^3
+ b*d*e^4)*x^3 + 15*(b*c^4*d^4*e + 2*b*c^2*d^3*e^2 + b*d^2*e^3)*x)*arcsin(c
*x) + (7*b*c^3*d^4*e + 5*b*c*d^3*e^2 + 2*(3*b*c^3*d^2*e^3 + 2*b*c*d*e^4)*x^
4 + (13*b*c^3*d^3*e^2 + 9*b*c*d^2*e^3)*x^2)*sqrt(-c^2*x^2 + 1))*sqrt(e*x^2
+ d))/(c^4*d^8*e + 2*c^2*d^7*e^2 + d^6*e^3 + (c^4*d^5*e^4 + 2*c^2*d^4*e^5 +
 d^3*e^6)*x^6 + 3*(c^4*d^6*e^3 + 2*c^2*d^5*e^4 + d^4*e^5)*x^4 + 3*(c^4*d^7*
e^2 + 2*c^2*d^6*e^3 + d^5*e^4)*x^2), 1/15*(4*(b*c^4*d^5 + 2*b*c^2*d^4*e + (
b*c^4*d^2*e^3 + 2*b*c^2*d*e^4 + b*e^5)*x^6 + b*d^3*e^2 + 3*(b*c^4*d^3*e^2 +
 2*b*c^2*d^2*e^3 + b*d*e^4)*x^4 + 3*(b*c^4*d^4*e + 2*b*c^2*d^3*e^2 + b*d^2*
e^3)*x^2)*sqrt(e)*arctan(1/2*(2*c^2*e*x^2 + c^2*d - e)*sqrt(-c^2*x^2 + 1)*s
qrt(e*x^2 + d)*sqrt(e)/(c^3*e^2*x^4 - c*d*e + (c^3*d*e - c*e^2)*x^2)) + (8*
(a*c^4*d^2*e^3 + 2*a*c^2*d*e^4 + a*e^5)*x^5 + 20*(a*c^4*d^3*e^2 + 2*a*c^2*d
^2*e^3 + a*d*e^4)*x^3 + 15*(a*c^4*d^4*e + 2*a*c^2*d^3*e^2 + a*d^2*e^3)*x +
(8*(b*c^4*d^2*e^3 + 2*b*c^2*d*e^4 + b*e^5)*x^5 + 20*(b*c^4*d^3*e^2 + 2*b*c^
2*d^2*e^3 + b*d*e^4)*x^3 + 15*(b*c^4*d^4*e + 2*b*c^2*d^3*e^2 + b*d^2*e^3)*x
)*arcsin(c*x) + (7*b*c^3*d^4*e + 5*b*c*d^3*e^2 + 2*(3*b*c^3*d^2*e^3 + 2*b*c
*d*e^4)*x^4 + (13*b*c^3*d^3*e^2 + 9*b*c*d^2*e^3)*x^2)*sqrt(-c^2*x^2 + 1))*s
qrt(e*x^2 + d))/(c^4*d^8*e + 2*c^2*d^7*e^2 + d^6*e^3 + (c^4*d^5*e^4 + 2*c^2
*d^4*e^5 + d^3*e^6)*x^6 + 3*(c^4*d^6*e^3 + 2*c^2*d^5*e^4 + d^4*e^5)*x^4 + 3
*(c^4*d^7*e^2 + 2*c^2*d^6*e^3 + d^5*e^4)*x^2)]
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(cx)}{(d + ex^2)^{7/2}} \, dx = \text{Timed out}$$

```
[In] integrate((a+b*asin(c*x))/(e*x**2+d)**(7/2),x)
[Out] Timed out
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{7/2}}\,dx=\int \frac{b\arcsin{(cx)}+a}{(ex^2+d)^{\frac{7}{2}}}\,dx$$

[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x, algorithm="maxima")

[Out] 1/15*a*(8*x/(sqrt(e*x^2 + d)*d^3) + 4*x/((e*x^2 + d)^(3/2)*d^2) + 3*x/((e*x^2 + d)^(5/2)*d)) + b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^3)*sqrt(e*x^2 + d)), x)

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{7/2}}\,dx=\int \frac{b\arcsin{(cx)}+a}{(ex^2+d)^{\frac{7}{2}}}\,dx$$

[In] integrate((a+b*arcsin(c*x))/(e*x^2+d)^(7/2),x, algorithm="giac")

[Out] integrate((b*arcsin(c*x) + a)/(e*x^2 + d)^(7/2), x)

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex^2)^{7/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{{(e\,x^2+d)}^{7/2}}\,dx$$

[In] int((a + b*asin(c*x))/(d + e*x^2)^(7/2),x)

[Out] int((a + b*asin(c*x))/(d + e*x^2)^(7/2), x)

3.654 $\int (fx)^m (d+ex^2)^3 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 484

$$\begin{aligned}
&\int (fx)^m (d+ex^2)^3 (a+b\arcsin(cx))\,dx \\
&= \frac{be\left(3c^2de(7+m)^2(12+7m+m^2)+3c^4d^2(35+12m+m^2)^2+e^2(360+342m+119m^2+18m^3+m^4)\right)}{c^5f^2(3+m)^2(5+m)^2(7+m)^2} \\
&\quad + \frac{be^2(3c^2d(7+m)^2+e(30+11m+m^2))(fx)^{4+m}\sqrt{1-c^2x^2}}{c^3f^4(5+m)^2(7+m)^2} + \frac{be^3(fx)^{6+m}\sqrt{1-c^2x^2}}{cf^6(7+m)^2} \\
&\quad + \frac{d^3(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)} + \frac{3d^2e(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)} \\
&\quad + \frac{3de^2(fx)^{5+m}(a+b\arcsin(cx))}{f^5(5+m)} + \frac{e^3(fx)^{7+m}(a+b\arcsin(cx))}{f^7(7+m)} \\
&\quad - \frac{b\left(\frac{c^6d^3(3+m)(5+m)(7+m)}{1+m} + \frac{e(2+m)\left(3c^2de(7+m)^2(12+7m+m^2)+3c^4d^2(35+12m+m^2)^2+e^2(360+342m+119m^2+18m^3+m^4)\right)}{(3+m)(5+m)(7+m)}\right)(}{c^5f^2(2+m)(3+m)(5+m)(7+m)}
\end{aligned}$$

```
[Out] d^3*(f*x)^(1+m)*(a+b*arcsin(c*x))/f/(1+m)+3*d^2*e*(f*x)^(3+m)*(a+b*arcsin(c
*x))/f^3/(3+m)+3*d*e^2*(f*x)^(5+m)*(a+b*arcsin(c*x))/f^5/(5+m)+e^3*(f*x)^(7
+m)*(a+b*arcsin(c*x))/f^7/(7+m)-b*(c^6*d^3*(3+m)*(5+m)*(7+m)/(1+m)+e*(2+m)*
(3*c^2*d*e*(7+m)^2*(m^2+7*m+12)+3*c^4*d^2*(m^2+12*m+35)^2+e^2*(m^4+18*m^3+1
19*m^2+342*m+360))/(m^3+15*m^2+71*m+105))*(f*x)^(2+m)*hypergeom([1/2, 1+1/2
*m],[2+1/2*m],c^2*x^2)/c^5/f^2/(2+m)/(3+m)/(5+m)/(7+m)+b*e*(3*c^2*d*e*(7+m)
^2*(m^2+7*m+12)+3*c^4*d^2*(m^2+12*m+35)^2+e^2*(m^4+18*m^3+119*m^2+342*m+360
))*(f*x)^(2+m)*(-c^2*x^2+1)^(1/2)/c^5/f^2/(3+m)^2/(5+m)^2/(7+m)^2+b*e^2*(3*
c^2*d*(7+m)^2+e*(m^2+11*m+30))*(f*x)^(4+m)*(-c^2*x^2+1)^(1/2)/c^3/f^4/(5+m)
^2/(7+m)^2+b*e^3*(f*x)^(6+m)*(-c^2*x^2+1)^(1/2)/c/f^6/(7+m)^2
```

Rubi [A] (verified)

Time = 1.59 (sec) , antiderivative size = 455, normalized size of antiderivative = 0.94, number of steps used = 6, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {276, 4815, 12, 1823, 1281, 470, 371}

$$\int (fx)^m \left(d+ex^2\right)^3 (a+b\arcsin(cx))\,dx$$
$$= \frac{d^3(fx)^{m+1}(a+b\arcsin(cx))}{f(m+1)} + \frac{3d^2e(fx)^{m+3}(a+b\arcsin(cx))}{f^3(m+3)}$$
$$+ \frac{3de^2(fx)^{m+5}(a+b\arcsin(cx))}{f^5(m+5)} + \frac{e^3(fx)^{m+7}(a+b\arcsin(cx))}{f^7(m+7)}$$
$$+ \frac{be^3\sqrt{1-c^2x^2}(fx)^{m+6}}{cf^6(m+7)^2} + \frac{be^2\sqrt{1-c^2x^2}(fx)^{m+4}\left(3c^2d(m+7)^2+e(m^2+11m+30)\right)}{c^3f^4(m+5)^2(m+7)^2}$$
$$- \frac{bc(fx)^{m+2}\left(\frac{e\left(3c^4d^2\left(m^2+12m+35\right)^2+3c^2de(m+7)^2\left(m^2+7m+12\right)+e^2\left(m^4+18m^3+119m^2+342m+360\right)\right)}{c^6(m+3)^2(m+5)^2(m+7)^2}+\frac{d^3}{m^2+3m+2}\right)\text{Hyperge}}{f^2}$$
$$+ \frac{be\sqrt{1-c^2x^2}(fx)^{m+2}\left(3c^4d^2(m^2+12m+35)^2+3c^2de(m+7)^2\left(m^2+7m+12\right)+e^2(m^4+18m^3+119\right.}{c^5f^2(m+3)^2(m+5)^2(m+7)^2}$$

```
[In] Int[(f*x)^m*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*e*(3*c^2*d*e*(7 + m)^2*(12 + 7*m + m^2) + 3*c^4*d^2*(35 + 12*m + m^2)^2
+ e^2*(360 + 342*m + 119*m^2 + 18*m^3 + m^4))*(f*x)^(2 + m)*Sqrt[1 - c^2*x^
2])/(c^5*f^2*(3 + m)^2*(5 + m)^2*(7 + m)^2) + (b*e^2*(3*c^2*d*(7 + m)^2 + e
*(30 + 11*m + m^2))*(f*x)^(4 + m)*Sqrt[1 - c^2*x^2])/(c^3*f^4*(5 + m)^2*(7
+ m)^2) + (b*e^3*(f*x)^(6 + m)*Sqrt[1 - c^2*x^2])/(c*f^6*(7 + m)^2) + (d^3*
(f*x)^(1 + m)*(a + b*ArcSin[c*x]))/(f*(1 + m)) + (3*d^2*e*(f*x)^(3 + m)*(a
+ b*ArcSin[c*x]))/(f^3*(3 + m)) + (3*d*e^2*(f*x)^(5 + m)*(a + b*ArcSin[c*x]
))/(f^5*(5 + m)) + (e^3*(f*x)^(7 + m)*(a + b*ArcSin[c*x]))/(f^7*(7 + m)) -
(b*c*(d^3/(2 + 3*m + m^2) + (e*(3*c^2*d*e*(7 + m)^2*(12 + 7*m + m^2) + 3*c^
4*d^2*(35 + 12*m + m^2)^2 + e^2*(360 + 342*m + 119*m^2 + 18*m^3 + m^4)))/(c
^6*(3 + m)^2*(5 + m)^2*(7 + m)^2))*(f*x)^(2 + m)*Hypergeometric2F1[1/2, (2
+ m)/2, (4 + m)/2, c^2*x^2])/f^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
```

```
IGtQ[p, 0]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 1823

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Dist[1/(b*(m
+ q + 2*p + 1)), Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)*
Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /; G
tQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ[
Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \frac{d^3(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)} + \frac{3d^2e(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)} \\
&\quad + \frac{3de^2(fx)^{5+m}(a+b\arcsin(cx))}{f^5(5+m)} + \frac{e^3(fx)^{7+m}(a+b\arcsin(cx))}{f^7(7+m)} \\
&\quad - (bc)\int \frac{(fx)^{1+m}\left(\frac{d^3}{1+m}+\frac{3d^2ex^2}{3+m}+\frac{3de^2x^4}{5+m}+\frac{e^3x^6}{7+m}\right)}{f\sqrt{1-c^2x^2}}\,dx \\
&= \frac{d^3(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)} + \frac{3d^2e(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)} \\
&\quad + \frac{3de^2(fx)^{5+m}(a+b\arcsin(cx))}{f^5(5+m)} + \frac{e^3(fx)^{7+m}(a+b\arcsin(cx))}{f^7(7+m)} \\
&\quad - \frac{(bc)\int \frac{(fx)^{1+m}\left(\frac{d^3}{1+m}+\frac{3d^2ex^2}{3+m}+\frac{3de^2x^4}{5+m}+\frac{e^3x^6}{7+m}\right)}{\sqrt{1-c^2x^2}}\,dx}{f} \\
&= \frac{be^3(fx)^{6+m}\sqrt{1-c^2x^2}}{cf^6(7+m)^2} + \frac{d^3(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)} \\
&\quad + \frac{3d^2e(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)} \\
&\quad + \frac{3de^2(fx)^{5+m}(a+b\arcsin(cx))}{f^5(5+m)} + \frac{e^3(fx)^{7+m}(a+b\arcsin(cx))}{f^7(7+m)} \\
&\quad + \frac{b\int \frac{(fx)^{1+m}\left(-\frac{c^2d^3(7+m)}{1+m}-\frac{3c^2d^2e(7+m)x^2}{3+m}-\frac{e^2\left(3c^2d(7+m)^2+e\left(30+11m+m^2\right)\right)x^4}{(5+m)(7+m)}\right)}{\sqrt{1-c^2x^2}}\,dx}{cf(7+m)} \\
&= \frac{be^2(3c^2d(7+m)^2+e(30+11m+m^2))\,(fx)^{4+m}\sqrt{1-c^2x^2}}{c^3f^4(5+m)^2(7+m)^2} + \frac{be^3(fx)^{6+m}\sqrt{1-c^2x^2}}{cf^6(7+m)^2} \\
&\quad + \frac{d^3(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)} + \frac{3d^2e(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)} \\
&\quad + \frac{3de^2(fx)^{5+m}(a+b\arcsin(cx))}{f^5(5+m)} + \frac{e^3(fx)^{7+m}(a+b\arcsin(cx))}{f^7(7+m)} \\
&\quad - \frac{b\int \frac{(fx)^{1+m}\left(\frac{c^4d^3(5+m)(7+m)}{1+m}+\frac{e\left(3c^2de(7+m)^2\left(12+7m+m^2\right)+3c^4d^2\left(35+12m+m^2\right)^2+e^2\left(360+342m+119m^2+18m^3+m^4\right)\right)x^2}{(3+m)(5+m)(7+m)}\right)}{\sqrt{1-c^2x^2}}\,dx}{c^3f(5+m)(7+m)}
\end{aligned}
$$

$$= \frac{be\Big(3c^2de(7+m)^2\left(12+7m+m^2\right)+3c^4d^2\left(35+12m+m^2\right)^2+e^2(360+342m+119m^2+18m^3}{c^5f^2(3+m)^2(5+m)^2(7+m)^2}$$
$$+\frac{be^2\left(3c^2d(7+m)^2+e\left(30+11m+m^2\right)\right)(fx)^{4+m}\sqrt{1-c^2x^2}}{c^3f^4(5+m)^2(7+m)^2}$$
$$+\frac{be^3(fx)^{6+m}\sqrt{1-c^2x^2}}{cf^6(7+m)^2}+\frac{d^3(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)}$$
$$+\frac{3d^2e(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)}$$
$$+\frac{3de^2(fx)^{5+m}(a+b\arcsin(cx))}{f^5(5+m)}+\frac{e^3(fx)^{7+m}(a+b\arcsin(cx))}{f^7(7+m)}$$
$$-\frac{\left(b\left(\frac{c^6d^3}{1+m}+\frac{e(2+m)\left(3c^2de(7+m)^2(12+7m+m^2)+3c^4d^2(35+12m+m^2)^2+e^2(360+342m+119m^2+18m^3+m^4)\right)}{(3+m)^2(5+m)^2(7+m)^2}\right)\right)\int\frac{(fx}{\sqrt{1\cdot}}}{c^5f}$$

$$= \frac{be\Big(3c^2de(7+m)^2\left(12+7m+m^2\right)+3c^4d^2\left(35+12m+m^2\right)^2+e^2(360+342m+119m^2+18m^3}{c^5f^2(3+m)^2(5+m)^2(7+m)^2}$$
$$+\frac{be^2\left(3c^2d(7+m)^2+e\left(30+11m+m^2\right)\right)(fx)^{4+m}\sqrt{1-c^2x^2}}{c^3f^4(5+m)^2(7+m)^2}$$
$$+\frac{be^3(fx)^{6+m}\sqrt{1-c^2x^2}}{cf^6(7+m)^2}+\frac{d^3(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)}$$
$$+\frac{3d^2e(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)}$$
$$+\frac{3de^2(fx)^{5+m}(a+b\arcsin(cx))}{f^5(5+m)}+\frac{e^3(fx)^{7+m}(a+b\arcsin(cx))}{f^7(7+m)}$$
$$-\frac{b\left(\frac{c^6d^3}{1+m}+\frac{e(2+m)\left(3c^2de(7+m)^2(12+7m+m^2)+3c^4d^2(35+12m+m^2)^2+e^2(360+342m+119m^2+18m^3+m^4)\right)}{(3+m)^2(5+m)^2(7+m)^2}\right)(fx)^{2+m}}{c^5f^2(2+m)}$$

Mathematica [A] (verified)

Time = 0.39 (sec) , antiderivative size = 310, normalized size of antiderivative = 0.64

$$\int (fx)^m \left(d+ex^2\right)^3 (a+b\arcsin(cx))\,dx$$
$$=x(fx)^m\left(\frac{ad^3}{1+m}+\frac{3ad^2ex^2}{3+m}+\frac{3ade^2x^4}{5+m}+\frac{ae^3x^6}{7+m}+\frac{bd^3\arcsin(cx)}{1+m}+\frac{3bd^2ex^2\arcsin(cx)}{3+m}\right.$$
$$+\frac{3bde^2x^4\arcsin(cx)}{5+m}+\frac{be^3x^6\arcsin(cx)}{7+m}$$
$$-\frac{bcd^3x\,\text{Hypergeometric2F1}\left(\frac{1}{2},1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)}{2+3m+m^2}$$
$$-\frac{3bcd^2ex^3\,\text{Hypergeometric2F1}\left(\frac{1}{2},2+\frac{m}{2},3+\frac{m}{2},c^2x^2\right)}{12+7m+m^2}$$
$$-\frac{3bcde^2x^5\,\text{Hypergeometric2F1}\left(\frac{1}{2},3+\frac{m}{2},4+\frac{m}{2},c^2x^2\right)}{(5+m)(6+m)}$$
$$\left.-\frac{bce^3x^7\,\text{Hypergeometric2F1}\left(\frac{1}{2},4+\frac{m}{2},5+\frac{m}{2},c^2x^2\right)}{(7+m)(8+m)}\right)$$

```
[In] Integrate[(f*x)^m*(d + e*x^2)^3*(a + b*ArcSin[c*x]),x]
```

```
[Out] x*(f*x)^m*((a*d^3)/(1 + m) + (3*a*d^2*e*x^2)/(3 + m) + (3*a*d*e^2*x^4)/(5 +
 m) + (a*e^3*x^6)/(7 + m) + (b*d^3*ArcSin[c*x])/(1 + m) + (3*b*d^2*e*x^2*Ar
cSin[c*x])/(3 + m) + (3*b*d*e^2*x^4*ArcSin[c*x])/(5 + m) + (b*e^3*x^6*ArcSi
n[c*x])/(7 + m) - (b*c*d^3*x*Hypergeometric2F1[1/2, 1 + m/2, 2 + m/2, c^2*x
^2])/(2 + 3*m + m^2) - (3*b*c*d^2*e*x^3*Hypergeometric2F1[1/2, 2 + m/2, 3 +
 m/2, c^2*x^2])/(12 + 7*m + m^2) - (3*b*c*d*e^2*x^5*Hypergeometric2F1[1/2,
3 + m/2, 4 + m/2, c^2*x^2])/((5 + m)*(6 + m)) - (b*c*e^3*x^7*Hypergeometric
2F1[1/2, 4 + m/2, 5 + m/2, c^2*x^2])/((7 + m)*(8 + m)))
```

Maple [F]

$$\int (fx)^m \left(e\,x^2+d\right)^3 (a+b\arcsin(cx))\,dx$$

```
[In] int((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

```
[Out] int((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$\int (fx)^m \left(d+ex^2\right)^3 (a+b\arcsin(cx))\,dx = \int \left(ex^2+d\right)^3 (b\arcsin(cx)+a)(fx)^m\,dx$$

```
[In] integrate((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((a*e^3*x^6 + 3*a*d*e^2*x^4 + 3*a*d^2*e*x^2 + a*d^3 + (b*e^3*x^6 +
3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arcsin(c*x))*(f*x)^m, x)
```

Sympy [F]

$$\int (fx)^m \left(d+ex^2\right)^3 (a+b\arcsin(cx))\,dx = \int (fx)^m (a+b\,\mathrm{asin}(cx)) \left(d+ex^2\right)^3\,dx$$

```
[In] integrate((f*x)**m*(e*x**2+d)**3*(a+b*asin(c*x)),x)
[Out] Integral((f*x)**m*(a + b*asin(c*x))*(d + e*x**2)**3, x)
```

Maxima [F]

$$\int (fx)^m \left(d+ex^2\right)^3 (a+b\arcsin(cx))\,dx = \int \left(ex^2+d\right)^3 (b\arcsin(cx)+a)(fx)^m\,dx$$

```
[In] integrate((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] a*e^3*f^m*x^7*x^m/(m + 7) + 3*a*d*e^2*f^m*x^5*x^m/(m + 5) + 3*a*d^2*e*f^m*x
^3*x^m/(m + 3) + (f*x)^(m + 1)*a*d^3/(f*(m + 1)) + (((b*e^3*f^m*m^3 + 9*b*e
^3*f^m*m^2 + 23*b*e^3*f^m*m + 15*b*e^3*f^m)*x^7 + 3*(b*d*e^2*f^m*m^3 + 11*b
*d*e^2*f^m*m^2 + 31*b*d*e^2*f^m*m + 21*b*d*e^2*f^m)*x^5 + 3*(b*d^2*e*f^m*m^
3 + 13*b*d^2*e*f^m*m^2 + 47*b*d^2*e*f^m*m + 35*b*d^2*e*f^m)*x^3 + (b*d^3*f^
m*m^3 + 15*b*d^3*f^m*m^2 + 71*b*d^3*f^m*m + 105*b*d^3*f^m)*x)*x^m*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (m^4 + 16*m^3 + 86*m^2 + 176*m + 105)*i
ntegrate(-((b*c*e^3*f^m*m^3 + 9*b*c*e^3*f^m*m^2 + 23*b*c*e^3*f^m*m + 15*b*c
*e^3*f^m)*x^7 + 3*(b*c*d*e^2*f^m*m^3 + 11*b*c*d*e^2*f^m*m^2 + 31*b*c*d*e^2*
f^m*m + 21*b*c*d*e^2*f^m)*x^5 + 3*(b*c*d^2*e*f^m*m^3 + 13*b*c*d^2*e*f^m*m^2
 + 47*b*c*d^2*e*f^m*m + 35*b*c*d^2*e*f^m)*x^3 + (b*c*d^3*f^m*m^3 + 15*b*c*d
^3*f^m*m^2 + 71*b*c*d^3*f^m*m + 105*b*c*d^3*f^m)*x)*sqrt(c*x + 1)*sqrt(-c*x
 + 1)*x^m/(m^4 + 16*m^3 - (c^2*m^4 + 16*c^2*m^3 + 86*c^2*m^2 + 176*c^2*m +
105*c^2)*x^2 + 86*m^2 + 176*m + 105), x))/(m^4 + 16*m^3 + 86*m^2 + 176*m +
105)
```

Giac [F]

$$\int (fx)^m (d+ex^2)^3 (a+b\arcsin(cx))\,dx = \int (ex^2+d)^3(b\arcsin(cx)+a)(fx)^m\,dx$$

```
[In] integrate((f*x)^m*(e*x^2+d)^3*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((e*x^2 + d)^3*(b*arcsin(c*x) + a)*(f*x)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int (fx)^m (d+ex^2)^3 (a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,(f\,x)^m\,(e\,x^2+d)^3\,dx$$

```
[In] int((a + b*asin(c*x))*(f*x)^m*(d + e*x^2)^3,x)
[Out] int((a + b*asin(c*x))*(f*x)^m*(d + e*x^2)^3, x)
```

3.655 $\int (fx)^m (d+ex^2)^2 (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 23, antiderivative size = 293

$$\int (fx)^m (d+ex^2)^2 (a+b\arcsin(cx))\,dx = \frac{be(2c^2d(5+m)^2+e(12+7m+m^2))(fx)^{2+m}\sqrt{1-c^2x^2}}{c^3f^2(3+m)^2(5+m)^2} + \frac{be^2(fx)^{4+m}\sqrt{1-c^2x^2}}{cf^4(5+m)^2} + \frac{d^2(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)} + \frac{2de(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)} + \frac{e^2(fx)^{5+m}(a+b\arcsin(cx))}{f^5(5+m)} - \frac{b\left(\frac{c^4d^2(3+m)(5+m)}{1+m}+\frac{e(2+m)(2c^2d(5+m)^2+e(12+7m+m^2))}{(3+m)(5+m)}\right)(fx)^{2+m}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{c^3f^2(2+m)(3+m)(5+m)}$$

```
[Out] d^2*(f*x)^(1+m)*(a+b*arcsin(c*x))/f/(1+m)+2*d*e*(f*x)^(3+m)*(a+b*arcsin(c*x
))/f^3/(3+m)+e^2*(f*x)^(5+m)*(a+b*arcsin(c*x))/f^5/(5+m)-b*(c^4*d^2*(3+m)*(
5+m)/(1+m)+e*(2+m)*(2*c^2*d*(5+m)^2+e*(m^2+7*m+12))/(3+m)/(5+m))*(f*x)^(2+m
)*hypergeom([1/2, 1+1/2*m],[2+1/2*m],c^2*x^2)/c^3/f^2/(2+m)/(3+m)/(5+m)+b*e
*(2*c^2*d*(5+m)^2+e*(m^2+7*m+12))*(f*x)^(2+m)*(-c^2*x^2+1)^(1/2)/c^3/f^2/(3
+m)^2/(5+m)^2+b*e^2*(f*x)^(4+m)*(-c^2*x^2+1)^(1/2)/c/f^4/(5+m)^2
```

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 272, normalized size of antiderivative = 0.93, number of steps used = 5, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {276, 4815, 12, 1281, 470, 371}

$$\int (fx)^m \left(d+ex^2\right)^2 (a+b\arcsin(cx))\,dx = \frac{d^2(fx)^{m+1}(a+b\arcsin(cx))}{f(m+1)} + \frac{2de(fx)^{m+3}(a+b\arcsin(cx))}{f^3(m+3)} + \frac{e^2(fx)^{m+5}(a+b\arcsin(cx))}{f^5(m+5)} + \frac{be^2\sqrt{1-c^2x^2}(fx)^{m+4}}{cf^4(m+5)^2} - \frac{bc(fx)^{m+2}\left(\frac{e(2c^2d(m+5)^2+e(m^2+7m+12))}{c^4(m+3)^2(m+5)^2}+\frac{d^2}{m^2+3m+2}\right)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{f^2} + \frac{be\sqrt{1-c^2x^2}(fx)^{m+2}\left(2c^2d(m+5)^2+e(m^2+7m+12)\right)}{c^3f^2(m+3)^2(m+5)^2}$$

```
[In] Int[(f*x)^m*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*e*(2*c^2*d*(5 + m)^2 + e*(12 + 7*m + m^2))*(f*x)^(2 + m)*Sqrt[1 - c^2*x^
2])/(c^3*f^2*(3 + m)^2*(5 + m)^2) + (b*e^2*(f*x)^(4 + m)*Sqrt[1 - c^2*x^2])
/(c*f^4*(5 + m)^2) + (d^2*(f*x)^(1 + m)*(a + b*ArcSin[c*x]))/(f*(1 + m)) +
(2*d*e*(f*x)^(3 + m)*(a + b*ArcSin[c*x]))/(f^3*(3 + m)) + (e^2*(f*x)^(5 + m
)*(a + b*ArcSin[c*x]))/(f^5*(5 + m)) - (b*c*(d^2/(2 + 3*m + m^2) + (e*(2*c^
2*d*(5 + m)^2 + e*(12 + 7*m + m^2)))/(c^4*(3 + m)^2*(5 + m)^2))*(f*x)^(2 +
m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/f^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 276

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 1281

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp[c^p*(f*x)^(m + 4*p - 1)*((d + e*x^2)^
(q + 1)/(e*f^(4*p - 1)*(m + 4*p + 2*q + 1))), x] + Dist[1/(e*(m + 4*p + 2*q
 + 1)), Int[(f*x)^m*(d + e*x^2)^q*ExpandToSum[e*(m + 4*p + 2*q + 1)*((a + b
*x^2 + c*x^4)^p - c^p*x^(4*p)) - d*c^p*(m + 4*p - 1)*x^(4*p - 2), x], x], x
] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0
] &&  !IntegerQ[q] && NeQ[m + 4*p + 2*q + 1, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{d^2(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)}+\frac{2de(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)}\\&\quad+\frac{e^2(fx)^{5+m}(a+b\arcsin(cx))}{f^5(5+m)}-(bc)\int\frac{(fx)^{1+m}\left(\frac{d^2}{1+m}+\frac{2dex^2}{3+m}+\frac{e^2x^4}{5+m}\right)}{f\sqrt{1-c^2x^2}}\,dx\\&=\frac{d^2(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)}+\frac{2de(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)}\\&\quad+\frac{e^2(fx)^{5+m}(a+b\arcsin(cx))}{f^5(5+m)}-\frac{(bc)\int\frac{(fx)^{1+m}\left(\frac{d^2}{1+m}+\frac{2dex^2}{3+m}+\frac{e^2x^4}{5+m}\right)}{\sqrt{1-c^2x^2}}\,dx}{f}\\&=\frac{be^2(fx)^{4+m}\sqrt{1-c^2x^2}}{cf^4(5+m)^2}+\frac{d^2(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)}+\frac{2de(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)}\\&\quad+\frac{e^2(fx)^{5+m}(a+b\arcsin(cx))}{f^5(5+m)}+\frac{b\int\frac{(fx)^{1+m}\left(-\frac{c^2d^2(5+m)}{1+m}-\frac{e\left(2c^2d(5+m)^2+e\left(12+7m+m^2\right)\right)x^2}{(3+m)(5+m)}\right)}{\sqrt{1-c^2x^2}}\,dx}{cf(5+m)}\end{aligned}$$

$$= \frac{be(2c^2d(5+m)^2+e(12+7m+m^2))(fx)^{2+m}\sqrt{1-c^2x^2}}{c^3f^2(3+m)^2(5+m)^2} + \frac{be^2(fx)^{4+m}\sqrt{1-c^2x^2}}{cf^4(5+m)^2} + \frac{d^2(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)} + \frac{2de(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)} + \frac{e^2(fx)^{5+m}(a+b\arcsin(cx))}{f^5(5+m)} - \frac{\left(b\left(\frac{c^4d^2}{1+m}+\frac{e(2+m)(2c^2d(5+m)^2+e(12+7m+m^2))}{(3+m)^2(5+m)^2}\right)\right)\int\frac{(fx)^{1+m}}{\sqrt{1-c^2x^2}}\,dx}{c^3f}$$

$$= \frac{be(2c^2d(5+m)^2+e(12+7m+m^2))(fx)^{2+m}\sqrt{1-c^2x^2}}{c^3f^2(3+m)^2(5+m)^2} + \frac{be^2(fx)^{4+m}\sqrt{1-c^2x^2}}{cf^4(5+m)^2} + \frac{d^2(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)} + \frac{2de(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)} + \frac{e^2(fx)^{5+m}(a+b\arcsin(cx))}{f^5(5+m)} - \frac{b\left(\frac{c^4d^2}{1+m}+\frac{e(2+m)(2c^2d(5+m)^2+e(12+7m+m^2))}{(3+m)^2(5+m)^2}\right)(fx)^{2+m}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{c^3f^2(2+m)}$$

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 224, normalized size of antiderivative = 0.76

$$\int (fx)^m\left(d+ex^2\right)^2(a+b\arcsin(cx))\,dx = x(fx)^m\left(\frac{ad^2}{1+m}+\frac{2adex^2}{3+m}+\frac{ae^2x^4}{5+m}+\frac{bd^2\arcsin(cx)}{1+m}+\frac{2bdex^2\arcsin(cx)}{3+m} + \frac{be^2x^4\arcsin(cx)}{5+m} - \frac{bcd^2x\,\text{Hypergeometric2F1}\left(\frac{1}{2},1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)}{2+3m+m^2} - \frac{2bcdex^3\,\text{Hypergeometric2F1}\left(\frac{1}{2},2+\frac{m}{2},3+\frac{m}{2},c^2x^2\right)}{12+7m+m^2} - \frac{bce^2x^5\,\text{Hypergeometric2F1}\left(\frac{1}{2},3+\frac{m}{2},4+\frac{m}{2},c^2x^2\right)}{(5+m)(6+m)}\right)$$

```
[In] Integrate[(f*x)^m*(d + e*x^2)^2*(a + b*ArcSin[c*x]),x]
```

```
[Out] x*(f*x)^m*((a*d^2)/(1 + m) + (2*a*d*e*x^2)/(3 + m) + (a*e^2*x^4)/(5 + m) +
(b*d^2*ArcSin[c*x])/(1 + m) + (2*b*d*e*x^2*ArcSin[c*x])/(3 + m) + (b*e^2*x^
4*ArcSin[c*x])/(5 + m) - (b*c*d^2*x*Hypergeometric2F1[1/2, 1 + m/2, 2 + m/2
, c^2*x^2])/(2 + 3*m + m^2) - (2*b*c*d*e*x^3*Hypergeometric2F1[1/2, 2 + m/2
, 3 + m/2, c^2*x^2])/(12 + 7*m + m^2) - (b*c*e^2*x^5*Hypergeometric2F1[1/2,
 3 + m/2, 4 + m/2, c^2*x^2])/((5 + m)*(6 + m)))
```

Maple [F]

$$\int (fx)^m \left(e\,x^2+d\right)^2 (a+b\arcsin{(cx)})\, dx$$

```
[In] int((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x)
[Out] int((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$\int (fx)^m \left(d+ex^2\right)^2 (a+b\arcsin(cx))\, dx = \int \left(ex^2+d\right)^2 (b\arcsin{(cx)}+a)(fx)^m\, dx$$

```
[In] integrate((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arcsin(c*x))*(f*x)^m, x)
```

Sympy [F]

$$\int (fx)^m \left(d+ex^2\right)^2 (a+b\arcsin(cx))\, dx = \int (fx)^m \left(a+b\,\mathrm{asin}\,{(cx)}\right) \left(d+ex^2\right)^2\, dx$$

```
[In] integrate((f*x)**m*(e*x**2+d)**2*(a+b*asin(c*x)),x)
[Out] Integral((f*x)**m*(a + b*asin(c*x))*(d + e*x**2)**2, x)
```

Maxima [F]

$$\int (fx)^m \left(d+ex^2\right)^2 (a+b\arcsin(cx))\, dx = \int \left(ex^2+d\right)^2 (b\arcsin{(cx)}+a)(fx)^m\, dx$$

```
[In] integrate((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] a*e^2*f^m*x^5*x^m/(m + 5) + 2*a*d*e*f^m*x^3*x^m/(m + 3) + (f*x)^(m + 1)*a*d
^2/(f*(m + 1)) + (((b*e^2*f^m*m^2 + 4*b*e^2*f^m*m + 3*b*e^2*f^m)*x^5 + 2*(b
*d*e*f^m*m^2 + 6*b*d*e*f^m*m + 5*b*d*e*f^m)*x^3 + (b*d^2*f^m*m^2 + 8*b*d^2*
f^m*m + 15*b*d^2*f^m)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (
m^3 + 9*m^2 + 23*m + 15)*integrate(-((b*c*e^2*f^m*m^2 + 4*b*c*e^2*f^m*m + 3
*b*c*e^2*f^m)*x^5 + 2*(b*c*d*e*f^m*m^2 + 6*b*c*d*e*f^m*m + 5*b*c*d*e*f^m)*x
^3 + (b*c*d^2*f^m*m^2 + 8*b*c*d^2*f^m*m + 15*b*c*d^2*f^m)*x)*sqrt(c*x + 1)*
sqrt(-c*x + 1)*x^m/(m^3 - (c^2*m^3 + 9*c^2*m^2 + 23*c^2*m + 15*c^2)*x^2 + 9
*m^2 + 23*m + 15), x))/(m^3 + 9*m^2 + 23*m + 15)
```

Giac [F]

$$\int (fx)^m (d+ex^2)^2 (a+b\arcsin(cx))\,dx = \int (ex^2+d)^2 (b\arcsin(cx)+a)(fx)^m\,dx$$

```
[In] integrate((f*x)^m*(e*x^2+d)^2*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((e*x^2 + d)^2*(b*arcsin(c*x) + a)*(f*x)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int (fx)^m (d+ex^2)^2 (a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,(f\,x)^m\,(e\,x^2+d)^2\,dx$$

```
[In] int((a + b*asin(c*x))*(f*x)^m*(d + e*x^2)^2,x)
[Out] int((a + b*asin(c*x))*(f*x)^m*(d + e*x^2)^2, x)
```

3.656 $\int (fx)^m \left(d+ex^2\right) (a+b \arcsin (cx)) \, dx$

Optimal result

Integrand size = 21, antiderivative size = 161

$$\int (fx)^m \left(d+ex^2\right) (a+b \arcsin (cx)) \, dx = \frac{be(fx)^{2+m}\sqrt{1-c^2x^2}}{cf^2(3+m)^2}+\frac{d(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)}+\frac{e(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)} - \frac{b(e(1+m)(2+m)+c^2d(3+m)^2)\,(fx)^{2+m}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{cf^2(1+m)(2+m)(3+m)^2}$$

```
[Out] d*(f*x)^(1+m)*(a+b*arcsin(c*x))/f/(1+m)+e*(f*x)^(3+m)*(a+b*arcsin(c*x))/f^3
/(3+m)-b*(e*(1+m)*(2+m)+c^2*d*(3+m)^2)*(f*x)^(2+m)*hypergeom([1/2, 1+1/2*m]
,[2+1/2*m],c^2*x^2)/c/f^2/(1+m)/(2+m)/(3+m)^2+b*e*(f*x)^(2+m)*(-c^2*x^2+1)^
(1/2)/c/f^2/(3+m)^2
```

Rubi [A] (verified)

Time = 0.12 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.92, number of steps used = 4, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {14, 4815, 12, 470, 371}

$$\int (fx)^m \left(d+ex^2\right) (a+b \arcsin (cx)) \, dx = \frac{d(fx)^{m+1}(a+b\arcsin(cx))}{f(m+1)}+\frac{e(fx)^{m+3}(a+b\arcsin(cx))}{f^3(m+3)} - \frac{bc(fx)^{m+2}\left(\frac{e}{c^2(m+3)^2}+\frac{d}{m^2+3m+2}\right)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},c^2x^2\right)}{f^2} + \frac{be\sqrt{1-c^2x^2}(fx)^{m+2}}{cf^2(m+3)^2}$$

```
[In] Int[(f*x)^m*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
```

```
[Out] (b*e*(f*x)^(2 + m)*Sqrt[1 - c^2*x^2])/(c*f^2*(3 + m)^2) + (d*(f*x)^(1 + m)*
(a + b*ArcSin[c*x]))/(f*(1 + m)) + (e*(f*x)^(3 + m)*(a + b*ArcSin[c*x]))/(f
^3*(3 + m)) - (b*c*(e/(c^2*(3 + m)^2) + d/(2 + 3*m + m^2))*(f*x)^(2 + m)*Hy
pergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, c^2*x^2])/f^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[d*(e*x)^(m + 1)*((a + b*x^n)^(p + 1)/(b*e*(m + n*(p
+ 1) + 1))), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 4815

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_
)^2)^(p_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^p, x]}, Dist
[a + b*ArcSin[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/Sqrt[1 - c^2*
x^2], x], x], x]] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[c^2*d + e, 0] &
& IntegerQ[p] && (GtQ[p, 0] || (IGtQ[(m - 1)/2, 0] && LeQ[m + p, 0]))
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{d(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)}+\frac{e(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)}\\&\quad-(bc)\int\frac{(fx)^{1+m}\left(d(3+m)+e(1+m)x^2\right)}{f(1+m)(3+m)\sqrt{1-c^2x^2}}\,dx\end{aligned}$$

$$=\frac{d(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)}+\frac{e(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)}-\frac{(bc)\int\frac{(fx)^{1+m}(d(3+m)+e(1+m)x^2)}{\sqrt{1-c^2x^2}}dx}{f(3+4m+m^2)}$$

$$=\frac{be(fx)^{2+m}\sqrt{1-c^2x^2}}{cf^2(3+m)^2}+\frac{d(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)}+\frac{e(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)}-\frac{\left(bc\left(\frac{e(1+m)(2+m)}{c^2(3+m)}+d(3+m)\right)\right)\int\frac{(fx)^{1+m}}{\sqrt{1-c^2x^2}}dx}{f(3+4m+m^2)}$$

$$=\frac{be(fx)^{2+m}\sqrt{1-c^2x^2}}{cf^2(3+m)^2}+\frac{d(fx)^{1+m}(a+b\arcsin(cx))}{f(1+m)}+\frac{e(fx)^{3+m}(a+b\arcsin(cx))}{f^3(3+m)}-\frac{bc\left(\frac{e(1+m)(2+m)}{c^2(3+m)}+d(3+m)\right)(fx)^{2+m}\operatorname{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2x^2\right)}{f^2(2+m)(3+4m+m^2)}$$

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 122, normalized size of antiderivative = 0.76

$$\int(fx)^m\left(d+ex^2\right)(a+b\arcsin(cx))\,dx$$

$$=x(fx)^m\left(-\frac{bcdx\operatorname{Hypergeometric2F1}\left(\frac{1}{2},1+\frac{m}{2},2+\frac{m}{2},c^2x^2\right)}{2+3m+m^2}+\frac{\frac{(d(3+m)+e(1+m)x^2)(a+b\arcsin(cx))}{1+m}-\frac{bcex^3\operatorname{Hypergeometric2F1}\left(\frac{1}{2},2+\frac{m}{2},3+\frac{m}{2},c^2x^2\right)}{4+m}}{3+m}\right)$$

```
[In] Integrate[(f*x)^m*(d + e*x^2)*(a + b*ArcSin[c*x]),x]
[Out] x*(f*x)^m*(-((b*c*d*x*Hypergeometric2F1[1/2, 1 + m/2, 2 + m/2, c^2*x^2])/(2
 + 3*m + m^2)) + (((d*(3 + m) + e*(1 + m)*x^2)*(a + b*ArcSin[c*x]))/(1 + m)
 - (b*c*e*x^3*Hypergeometric2F1[1/2, 2 + m/2, 3 + m/2, c^2*x^2])/(4 + m))/(
3 + m))
```

Maple [F]

$$\int(fx)^m\left(e\,x^2+d\right)(a+b\arcsin(cx))\,dx$$

```
[In] int((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x)
[Out] int((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x)
```

Fricas [F]

$$\int (fx)^m (d + ex^2) (a + b \arcsin(cx)) \, dx = \int (ex^2 + d)(b \arcsin(cx) + a)(fx)^m \, dx$$

```
[In] integrate((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arcsin(c*x))*(f*x)^m, x)
```

Sympy [F]

$$\int (fx)^m (d + ex^2) (a + b \arcsin(cx)) \, dx = \int (fx)^m (a + b \operatorname{asin}(cx)) (d + ex^2) \, dx$$

```
[In] integrate((f*x)**m*(e*x**2+d)*(a+b*asin(c*x)),x)
[Out] Integral((f*x)**m*(a + b*asin(c*x))*(d + e*x**2), x)
```

Maxima [F]

$$\int (fx)^m (d + ex^2) (a + b \arcsin(cx)) \, dx = \int (ex^2 + d)(b \arcsin(cx) + a)(fx)^m \, dx$$

```
[In] integrate((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] a*e*f^m*x^3*x^m/(m + 3) + (f*x)^(m + 1)*a*d/(f*(m + 1)) + (((b*e*f^m*m + b*
e*f^m)*x^3 + (b*d*f^m*m + 3*b*d*f^m)*x)*x^m*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1)) + (m^2 + 4*m + 3)*integrate(((b*c*e*f^m*m + b*c*e*f^m)*x^3 + (b
*c*d*f^m*m + 3*b*c*d*f^m)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x^m/((c^2*m^2 + 4
*c^2*m + 3*c^2)*x^2 - m^2 - 4*m - 3), x))/(m^2 + 4*m + 3)
```

Giac [F]

$$\int (fx)^m (d + ex^2) (a + b \arcsin(cx)) \, dx = \int (ex^2 + d)(b \arcsin(cx) + a)(fx)^m \, dx$$

```
[In] integrate((f*x)^m*(e*x^2+d)*(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate((e*x^2 + d)*(b*arcsin(c*x) + a)*(f*x)^m, x)
```

Mupad [F(-1)]

Timed out.

$$\int (fx)^m (d+ex^2) (a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,(f\,x)^m\,(e\,x^2+d)\,dx$$

```
[In] int((a + b*asin(c*x))*(f*x)^m*(d + e*x^2),x)
[Out] int((a + b*asin(c*x))*(f*x)^m*(d + e*x^2), x)
```

3.657 $\int \frac{(fx)^m(a+b\arcsin(cx))}{d+ex^2} dx$

Optimal result

Integrand size = 23, antiderivative size = 23

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{d+ex^2} dx = \text{Int}\left(\frac{(fx)^m(a+b\arcsin(cx))}{d+ex^2},x\right)$$

```
[Out] Unintegrable((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x)
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{d+ex^2} dx = \int \frac{(fx)^m(a+b\arcsin(cx))}{d+ex^2} dx$$

```
[In] Int[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
[Out] Defer[Int][((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{(fx)^m(a+b\arcsin(cx))}{d+ex^2} dx$$

Mathematica [N/A]

Not integrable

Time = 2.13 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{d+ex^2}\,dx=\int \frac{(fx)^m(a+b\arcsin(cx))}{d+ex^2}\,dx$$

```
[In] Integrate[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2),x]
[Out] Integrate[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 2.85 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int \frac{(fx)^m\,(a+b\arcsin\,(cx))}{e\,x^2+d}dx$$

```
[In] int((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x)
[Out] int((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{d+ex^2}\,dx=\int \frac{(b\arcsin\,(cx)+a)(fx)^m}{ex^2+d}\,dx$$

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)*(f*x)^m/(e*x^2 + d), x)
```

Sympy [N/A]

Not integrable

Time = 10.26 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.87

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{d+ex^2}\,dx=\int \frac{(fx)^m\,(a+b\,\mathrm{asin}\,(cx))}{d+ex^2}\,dx$$

```
[In] integrate((f*x)**m*(a+b*asin(c*x))/(e*x**2+d),x)
[Out] Integral((f*x)**m*(a + b*asin(c*x))/(d + e*x**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.50 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{d+ex^2}\,dx = \int \frac{(b\arcsin{(cx)}+a)(fx)^m}{ex^2+d}\,dx$$

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="maxima")
[Out] integrate((b*arcsin(c*x) + a)*(f*x)^m/(e*x^2 + d), x)
```

Giac [N/A]

Not integrable

Time = 0.62 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{d+ex^2}\,dx = \int \frac{(b\arcsin{(cx)}+a)(fx)^m}{ex^2+d}\,dx$$

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*(f*x)^m/(e*x^2 + d), x)
```

Mupad [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{d+ex^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\ (f\,x)^m}{e\,x^2+d}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f*x)^m)/(d + e*x^2),x)
[Out] int(((a + b*asin(c*x))*(f*x)^m)/(d + e*x^2), x)
```

3.658 $\int \frac{(fx)^m(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 23

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \text{Int}\left(\frac{(fx)^m(a+b\arcsin(cx))}{(d+ex^2)^2},x\right)$$

```
[Out] Unintegrable((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx = \int \frac{(fx)^m(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx$$

```
[In] Int[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
[Out] Defer[Int][((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2)^2, x]
```

Rubi steps

$$\text{integral} = \int \frac{(fx)^m(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 3.62 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx=\int \frac{(fx)^m(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx$$

```
[In] Integrate[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2)^2,x]
[Out] Integrate[((f*x)^m*(a + b*ArcSin[c*x]))/(d + e*x^2)^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.34 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int \frac{(fx)^m\,(a+b\arcsin(cx))}{(e\,x^2+d)^2}dx$$

```
[In] int((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x)
[Out] int((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.57

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx=\int \frac{(b\arcsin(cx)+a)(fx)^m}{(ex^2+d)^2}\,dx$$

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b*arcsin(c*x) + a)*(f*x)^m/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx=\text{Timed out}$$

```
[In] integrate((f*x)**m*(a+b*asin(c*x))/(e*x**2+d)**2,x)
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 0.55 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx=\int \frac{(b\arcsin{(cx)}+a)(fx)^m}{(ex^2+d)^2}\,dx$$

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
[Out] integrate((b*arcsin(c*x) + a)*(f*x)^m/(e*x^2 + d)^2, x)
```

Giac [N/A]

Not integrable

Time = 0.62 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx=\int \frac{(b\arcsin{(cx)}+a)(fx)^m}{(ex^2+d)^2}\,dx$$

```
[In] integrate((f*x)^m*(a+b*arcsin(c*x))/(e*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)*(f*x)^m/(e*x^2 + d)^2, x)
```

Mupad [N/A]

Not integrable

Time = 0.31 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(fx)^m(a+b\arcsin(cx))}{(d+ex^2)^2}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(f\,x\right)^m}{{\left(e\,x^2+d\right)}^2}\,dx$$

```
[In] int(((a + b*asin(c*x))*(f*x)^m)/(d + e*x^2)^2,x)
[Out] int(((a + b*asin(c*x))*(f*x)^m)/(d + e*x^2)^2, x)
```

3.659 $\int (d+ex^2)^3 (a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 20, antiderivative size = 569

$$\begin{aligned}
\int (d+ex^2)^3 (a+b\arcsin(cx))^2\,dx = & -2b^2d^3x-\frac{4b^2d^2ex}{3c^2}-\frac{16b^2de^2x}{25c^4}-\frac{32b^2e^3x}{245c^6}-\frac{2}{9}b^2d^2ex^3 \\
& -\frac{8b^2de^2x^3}{75c^2}-\frac{16b^2e^3x^3}{735c^4}-\frac{6}{125}b^2de^2x^5-\frac{12b^2e^3x^5}{1225c^2} \\
& -\frac{2}{343}b^2e^3x^7+\frac{2bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\
& +\frac{4bd^2e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3} \\
& +\frac{16bde^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c^5} \\
& +\frac{32be^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^7} \\
& +\frac{2bd^2ex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c} \\
& +\frac{8bde^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c^3} \\
& +\frac{16be^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^5} \\
& +\frac{6bde^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} \\
& +\frac{12be^3x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^3} \\
& +\frac{2be^3x^6\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{49c} \\
& +d^3x(a+b\arcsin(cx))^2+d^2ex^3(a+b\arcsin(cx))^2 \\
& +\frac{3}{5}de^2x^5(a+b\arcsin(cx))^2+\frac{1}{7}e^3x^7(a+b\arcsin(cx))^2
\end{aligned}$$

```
[Out] -2*b^2*d^3*x-4/3*b^2*d^2*e*x/c^2-16/25*b^2*d*e^2*x/c^4-32/245*b^2*e^3*x/c^6
-2/9*b^2*d^2*e*x^3-8/75*b^2*d*e^2*x^3/c^2-16/735*b^2*e^3*x^3/c^4-6/125*b^2*
d*e^2*x^5-12/1225*b^2*e^3*x^5/c^2-2/343*b^2*e^3*x^7+d^3*x*(a+b*arcsin(c*x))
^2+d^2*e*x^3*(a+b*arcsin(c*x))^2+3/5*d*e^2*x^5*(a+b*arcsin(c*x))^2+1/7*e^3*
x^7*(a+b*arcsin(c*x))^2+2*b*d^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+4/3*
b*d^2*e*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+16/25*b*d*e^2*(a+b*arcsin(
c*x))*(-c^2*x^2+1)^(1/2)/c^5+32/245*b*e^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1
/2)/c^7+2/3*b*d^2*e*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+8/25*b*d*e^2
*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+16/245*b*e^3*x^2*(a+b*arcsin(
c*x))*(-c^2*x^2+1)^(1/2)/c^5+6/25*b*d*e^2*x^4*(a+b*arcsin(c*x))*(-c^2*x^2+1
)^(1/2)/c+12/245*b*e^3*x^4*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+2/49*b*
e^3*x^6*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.64 (sec) , antiderivative size = 569, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.350$, Rules used

$= \{4757, 4715, 4767, 8, 4723, 4795, 30\}$

$$\int \left(d+ex^2\right)^3 (a+b\arcsin(cx))^2\,dx = \frac{2bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{2bd^2ex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c} + \frac{6bde^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} + \frac{2be^3x^6\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{49c} + \frac{32be^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^7} + \frac{16bde^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c^5} + \frac{16be^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^5} + \frac{4bd^2e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3} + \frac{8bde^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c^3} + \frac{12be^3x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^3} + d^3x(a+b\arcsin(cx))^2 + d^2ex^3(a+b\arcsin(cx))^2 + \frac{3}{5}de^2x^5(a+b\arcsin(cx))^2 + \frac{1}{7}e^3x^7(a+b\arcsin(cx))^2 - \frac{32b^2e^3x}{245c^6} - \frac{16b^2de^2x}{25c^4} - \frac{16b^2e^3x^3}{735c^4} - \frac{4b^2d^2ex}{3c^2} - \frac{8b^2de^2x^3}{75c^2} - \frac{12b^2e^3x^5}{1225c^2} - 2b^2d^3x - \frac{2}{9}b^2d^2ex^3 - \frac{6}{125}b^2de^2x^5 - \frac{2}{343}b^2e^3x^7$$

```
[In] Int[(d + e*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*d^3*x - (4*b^2*d^2*e*x)/(3*c^2) - (16*b^2*d*e^2*x)/(25*c^4) - (32*b^
2*e^3*x)/(245*c^6) - (2*b^2*d^2*e*x^3)/9 - (8*b^2*d*e^2*x^3)/(75*c^2) - (16
*b^2*e^3*x^3)/(735*c^4) - (6*b^2*d*e^2*x^5)/125 - (12*b^2*e^3*x^5)/(1225*c^
2) - (2*b^2*e^3*x^7)/343 + (2*b*d^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
c + (4*b*d^2*e*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^3) + (16*b*d*e^2
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c^5) + (32*b*e^3*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x]))/(245*c^7) + (2*b*d^2*e*x^2*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x]))/(3*c) + (8*b*d*e^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
))/(25*c^3) + (16*b*e^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(245*c^5
) + (6*b*d*e^2*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c) + (12*b*e^
3*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(245*c^3) + (2*b*e^3*x^6*Sqrt[
```

```
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(49*c) + d^3*x*(a + b*ArcSin[c*x])^2 + d^
2*e*x^3*(a + b*ArcSin[c*x])^2 + (3*d*e^2*x^5*(a + b*ArcSin[c*x])^2)/5 + (e^
3*x^7*(a + b*ArcSin[c*x])^2)/7
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
```

```
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(d^3(a+b\arcsin(cx))^2+3d^2ex^2(a+b\arcsin(cx))^2+3de^2x^4(a+b\arcsin(cx))^2 \right. \\
&\quad \left. +e^3x^6(a+b\arcsin(cx))^2\right)\,dx \\
&= d^3\int (a+b\arcsin(cx))^2\,dx+\left(3d^2e\right)\int x^2(a+b\arcsin(cx))^2\,dx \\
&\quad +\left(3de^2\right)\int x^4(a+b\arcsin(cx))^2\,dx+e^3\int x^6(a+b\arcsin(cx))^2\,dx \\
&= d^3x(a+b\arcsin(cx))^2+d^2ex^3(a+b\arcsin(cx))^2 \\
&\quad +\frac{3}{5}de^2x^5(a+b\arcsin(cx))^2+\frac{1}{7}e^3x^7(a+b\arcsin(cx))^2 \\
&\quad -\left(2bcd^3\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx-\left(2bcd^2e\right)\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&\quad -\frac{1}{5}\left(6bcde^2\right)\int \frac{x^5(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{7}\left(2bce^3\right)\int \frac{x^7(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{2bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{2bd^2ex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c} \\
&\quad +\frac{6bde^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c}+\frac{2be^3x^6\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{49c} \\
&\quad +d^3x(a+b\arcsin(cx))^2+d^2ex^3(a+b\arcsin(cx))^2 \\
&\quad +\frac{3}{5}de^2x^5(a+b\arcsin(cx))^2+\frac{1}{7}e^3x^7(a+b\arcsin(cx))^2-\left(2b^2d^3\right)\int 1\,dx \\
&\quad -\frac{1}{3}\left(2b^2d^2e\right)\int x^2\,dx-\frac{\left(4bd^2e\right)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{3c}-\frac{1}{25}\left(6b^2de^2\right)\int x^4\,dx \\
&\quad -\frac{\left(24bde^2\right)\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{25c}-\frac{1}{49}\left(2b^2e^3\right)\int x^6\,dx-\frac{\left(12be^3\right)\int \frac{x^5(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{49c}
\end{aligned}$$

$$= -2b^2d^3x - \frac{2}{9}b^2d^2ex^3 - \frac{6}{125}b^2de^2x^5 - \frac{2}{343}b^2e^3x^7 + \frac{2bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}$$
$$+ \frac{4bd^2e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3} + \frac{2bd^2ex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c}$$
$$+ \frac{8bde^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c^3} + \frac{6bde^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c}$$
$$+ \frac{12be^3x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^3} + \frac{2be^3x^6\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{49c}$$
$$+ d^3x(a+b\arcsin(cx))^2 + d^2ex^3(a+b\arcsin(cx))^2 + \frac{3}{5}de^2x^5(a+b\arcsin(cx))^2$$
$$+ \frac{1}{7}e^3x^7(a+b\arcsin(cx))^2 - \frac{(4b^2d^2e)\int 1\,dx}{3c^2} - \frac{(16bde^2)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{25c^3}$$
$$- \frac{(8b^2de^2)\int x^2\,dx}{25c^2} - \frac{(48be^3)\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{245c^3} - \frac{(12b^2e^3)\int x^4\,dx}{245c^2}$$

$$= -2b^2d^3x - \frac{4b^2d^2ex}{3c^2} - \frac{2}{9}b^2d^2ex^3 - \frac{8b^2de^2x^3}{75c^2} - \frac{6}{125}b^2de^2x^5 - \frac{12b^2e^3x^5}{1225c^2} - \frac{2}{343}b^2e^3x^7$$
$$+ \frac{2bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{4bd^2e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3}$$
$$+ \frac{16bde^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c^5} + \frac{2bd^2ex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c}$$
$$+ \frac{8bde^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c^3} + \frac{16be^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^5}$$
$$+ \frac{6bde^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} + \frac{12be^3x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^3}$$
$$+ \frac{2be^3x^6\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{49c} + d^3x(a+b\arcsin(cx))^2$$
$$+ d^2ex^3(a+b\arcsin(cx))^2 + \frac{3}{5}de^2x^5(a+b\arcsin(cx))^2 + \frac{1}{7}e^3x^7(a+b\arcsin(cx))^2$$
$$- \frac{(16b^2de^2)\int 1\,dx}{25c^4} - \frac{(32be^3)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{245c^5} - \frac{(16b^2e^3)\int x^2\,dx}{245c^4}$$

$$
\begin{aligned}
&= -2b^2d^3x - \frac{4b^2d^2ex}{3c^2} - \frac{16b^2de^2x}{25c^4} - \frac{2}{9}b^2d^2ex^3 - \frac{8b^2de^2x^3}{75c^2} \\
&\quad - \frac{16b^2e^3x^3}{735c^4} - \frac{6}{125}b^2de^2x^5 - \frac{12b^2e^3x^5}{1225c^2} - \frac{2}{343}b^2e^3x^7 \\
&\quad + \frac{2bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{4bd^2e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3} \\
&\quad + \frac{16bde^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c^5} + \frac{32be^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^7} \\
&\quad + \frac{2bd^2ex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c} + \frac{8bde^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c^3} \\
&\quad + \frac{16be^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^5} + \frac{6bde^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} \\
&\quad + \frac{12be^3x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^3} + \frac{2be^3x^6\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{49c} \\
&\quad + d^3x(a+b\arcsin(cx))^2 + d^2ex^3(a+b\arcsin(cx))^2 \\
&\quad + \frac{3}{5}de^2x^5(a+b\arcsin(cx))^2 + \frac{1}{7}e^3x^7(a+b\arcsin(cx))^2 - \frac{(32b^2e^3)\int 1\,dx}{245c^6} \\
&= -2b^2d^3x - \frac{4b^2d^2ex}{3c^2} - \frac{16b^2de^2x}{25c^4} - \frac{32b^2e^3x}{245c^6} - \frac{2}{9}b^2d^2ex^3 - \frac{8b^2de^2x^3}{75c^2} - \frac{16b^2e^3x^3}{735c^4} \\
&\quad - \frac{6}{125}b^2de^2x^5 - \frac{12b^2e^3x^5}{1225c^2} - \frac{2}{343}b^2e^3x^7 + \frac{2bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\
&\quad + \frac{4bd^2e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3} + \frac{16bde^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c^5} \\
&\quad + \frac{32be^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^7} + \frac{2bd^2ex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c} \\
&\quad + \frac{8bde^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c^3} + \frac{16be^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^5} \\
&\quad + \frac{6bde^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} + \frac{12be^3x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{245c^3} \\
&\quad + \frac{2be^3x^6\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{49c} + d^3x(a+b\arcsin(cx))^2 \\
&\quad + d^2ex^3(a+b\arcsin(cx))^2 + \frac{3}{5}de^2x^5(a+b\arcsin(cx))^2 + \frac{1}{7}e^3x^7(a+b\arcsin(cx))^2
\end{aligned}
$$

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 435, normalized size of antiderivative = 0.76

$$\int (d+ex^2)^3 (a+b\arcsin(cx))^2\,dx = d^3x(a+b\arcsin(cx))^2$$
$$+d^2ex^3(a+b\arcsin(cx))^2+\frac{3}{5}de^2x^5(a+b\arcsin(cx))^2+\frac{1}{7}e^3x^7(a+b\arcsin(cx))^2$$
$$-\frac{2bd^2e\left(-3a\sqrt{1-c^2x^2}(2+c^2x^2)+bcx(6+c^2x^2)-3b\sqrt{1-c^2x^2}(2+c^2x^2)\arcsin(cx)\right)}{9c^3}$$
$$-\frac{2bde^2\left(-15a\sqrt{1-c^2x^2}(8+4c^2x^2+3c^4x^4)+bcx(120+20c^2x^2+9c^4x^4)-15b\sqrt{1-c^2x^2}(8+4c^2x^2+3\right.}{375c^5}$$
$$-\frac{2be^3\left(-105a\sqrt{1-c^2x^2}(16+8c^2x^2+6c^4x^4+5c^6x^6)+bcx(1680+280c^2x^2+126c^4x^4+75c^6x^6)-105b\right.}{25725c^7}$$
$$-2bd^3\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right)$$

```
[In] Integrate[(d + e*x^2)^3*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] d^3*x*(a + b*ArcSin[c*x])^2 + d^2*e*x^3*(a + b*ArcSin[c*x])^2 + (3*d*e^2*x^
5*(a + b*ArcSin[c*x])^2)/5 + (e^3*x^7*(a + b*ArcSin[c*x])^2)/7 - (2*b*d^2*e
*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + b*c*x*(6 + c^2*x^2) - 3*b*Sqrt[1 -
 c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]))/(9*c^3) - (2*b*d*e^2*(-15*a*Sqrt[1 -
c^2*x^2]*(8 + 4*c^2*x^2 + 3*c^4*x^4) + b*c*x*(120 + 20*c^2*x^2 + 9*c^4*x^4)
 - 15*b*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x]))/(375*c^
5) - (2*b*e^3*(-105*a*Sqrt[1 - c^2*x^2]*(16 + 8*c^2*x^2 + 6*c^4*x^4 + 5*c^6
*x^6) + b*c*x*(1680 + 280*c^2*x^2 + 126*c^4*x^4 + 75*c^6*x^6) - 105*b*Sqrt[
1 - c^2*x^2]*(16 + 8*c^2*x^2 + 6*c^4*x^4 + 5*c^6*x^6)*ArcSin[c*x]))/(25725*
c^7) - 2*b*d^3*(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c)
```

Maple [A] (verified)

Time = 1.48 (sec) , antiderivative size = 702, normalized size of antiderivative = 1.23

method	result
derivativedivides	$\frac{a^2\left(d^3c^7x+d^2c^7e\,x^3+\frac{3}{5}d\,c^7e^2x^5+\frac{1}{7}e^3c^7x^7\right)}{c^6}+\frac{b^2\left(c^6d^3\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{c^4d^2e\left(9c^3x^3\arcsin(cx)^2+6\sqrt{\ldots}\right.}{\ldots}\right.}{\ldots}$
default	$\frac{a^2\left(d^3c^7x+d^2c^7e\,x^3+\frac{3}{5}d\,c^7e^2x^5+\frac{1}{7}e^3c^7x^7\right)}{c^6}+\frac{b^2\left(c^6d^3\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{c^4d^2e\left(9c^3x^3\arcsin(cx)^2+6\sqrt{\ldots}\right.}{\ldots}\right.}{\ldots}$
parts	$a^2\left(\frac{1}{7}e^3x^7+\frac{3}{5}d\,e^2x^5+d^2e\,x^3+d^3x\right)+\frac{b^2\left(55125\arcsin(cx)^2c^7x^7e^3+231525\arcsin(cx)^2c^7x^5d\,e^2+385875\,a\ldots\right.}{\ldots}$

```
[In] int((e*x^2+d)^3*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a^2/c^6*(d^3*c^7*x+d^2*c^7*e*x^3+3/5*d*c^7*e^2*x^5+1/7*e^3*c^7*x^7)+b^
2/c^6*(c^6*d^3*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2))+1
/9*c^4*d^2*e*(9*c^3*x^3*arcsin(c*x)^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*
c^2-2*c^3*x^3+12*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-12*c*x)+1/375*c^2*d*e^2*(22
5*arcsin(c*x)^2*c^5*x^5+90*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4*c^4-18*c^5*x^
5+120*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-40*c^3*x^3+240*arcsin(c*x)*(-c
^2*x^2+1)^(1/2)-240*c*x)+1/25725*e^3*(3675*arcsin(c*x)^2*c^7*x^7+1050*(-c^2
*x^2+1)^(1/2)*arcsin(c*x)*c^6*x^6-150*c^7*x^7+1260*(-c^2*x^2+1)^(1/2)*arcsi
n(c*x)*x^4*c^4-252*c^5*x^5+1680*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-560*
c^3*x^3+3360*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-3360*c*x))+2*a*b/c^6*(arcsin(c*
x)*d^3*c^7*x+arcsin(c*x)*d^2*c^7*e*x^3+3/5*arcsin(c*x)*d*c^7*e^2*x^5+1/7*ar
csin(c*x)*e^3*c^7*x^7-1/7*e^3*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4
*(-c^2*x^2+1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2
))+d^3*c^6*(-c^2*x^2+1)^(1/2)-d^2*c^4*e*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/
3*(-c^2*x^2+1)^(1/2))-3/5*d*c^2*e^2*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c
^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 555, normalized size of antiderivative = 0.98

$$\int\left(d+ex^2\right)^3\left(a+b\arcsin(cx)\right)^2dx$$
$$=\frac{1125\,(49\,a^2-2\,b^2)c^7e^3x^7+189\,(49\,(25\,a^2-2\,b^2)c^7de^2-20\,b^2c^5e^3)x^5+35\,(1225\,(9\,a^2-2\,b^2)c^7d^2e-1176\,b\ldots}{\ldots}$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/385875*(1125*(49*a^2 - 2*b^2)*c^7*e^3*x^7 + 189*(49*(25*a^2 - 2*b^2)*c^7*
d*e^2 - 20*b^2*c^5*e^3)*x^5 + 35*(1225*(9*a^2 - 2*b^2)*c^7*d^2*e - 1176*b^2
*c^5*d*e^2 - 240*b^2*c^3*e^3)*x^3 + 11025*(5*b^2*c^7*e^3*x^7 + 21*b^2*c^7*d
*e^2*x^5 + 35*b^2*c^7*d^2*e*x^3 + 35*b^2*c^7*d^3*x)*arcsin(c*x)^2 + 105*(36
75*(a^2 - 2*b^2)*c^7*d^3 - 4900*b^2*c^5*d^2*e - 2352*b^2*c^3*d*e^2 - 480*b^
2*c*e^3)*x + 22050*(5*a*b*c^7*e^3*x^7 + 21*a*b*c^7*d*e^2*x^5 + 35*a*b*c^7*d
^2*e*x^3 + 35*a*b*c^7*d^3*x)*arcsin(c*x) + 210*(75*a*b*c^6*e^3*x^6 + 3675*a
*b*c^6*d^3 + 2450*a*b*c^4*d^2*e + 1176*a*b*c^2*d*e^2 + 240*a*b*e^3 + 9*(49*
a*b*c^6*d*e^2 + 10*a*b*c^4*e^3)*x^4 + (1225*a*b*c^6*d^2*e + 588*a*b*c^4*d*e
^2 + 120*a*b*c^2*e^3)*x^2 + (75*b^2*c^6*e^3*x^6 + 3675*b^2*c^6*d^3 + 2450*b
^2*c^4*d^2*e + 1176*b^2*c^2*d*e^2 + 240*b^2*e^3 + 9*(49*b^2*c^6*d*e^2 + 10*
b^2*c^4*e^3)*x^4 + (1225*b^2*c^6*d^2*e + 588*b^2*c^4*d*e^2 + 120*b^2*c^2*e^
3)*x^2)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^7
```

Sympy [A] (verification not implemented)

Time = 0.97 (sec) , antiderivative size = 989, normalized size of antiderivative = 1.74

$$\int (d+ex^2)^3 (a+b\arcsin(cx))^2\,dx$$
$$= \begin{cases} a^2d^3x + a^2d^2ex^3 + \frac{3a^2de^2x^5}{5} + \frac{a^2e^3x^7}{7} + 2abd^3x\operatorname{asin}(cx) + 2abd^2ex^3\operatorname{asin}(cx) + \frac{6abde^2x^5\operatorname{asin}(cx)}{5} + \frac{2abe^3x^7\operatorname{asi}}{7} \\ a^2\left(d^3x + d^2ex^3 + \frac{3de^2x^5}{5} + \frac{e^3x^7}{7}\right) \end{cases}$$

```
[In] integrate((e*x**2+d)**3*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d**3*x + a**2*d**2*e*x**3 + 3*a**2*d*e**2*x**5/5 + a**2*e**
3*x**7/7 + 2*a*b*d**3*x*asin(c*x) + 2*a*b*d**2*e*x**3*asin(c*x) + 6*a*b*d*e
**2*x**5*asin(c*x)/5 + 2*a*b*e**3*x**7*asin(c*x)/7 + 2*a*b*d**3*sqrt(-c**2*
x**2 + 1)/c + 2*a*b*d**2*e*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 6*a*b*d*e**2*x
**4*sqrt(-c**2*x**2 + 1)/(25*c) + 2*a*b*e**3*x**6*sqrt(-c**2*x**2 + 1)/(49*
c) + 4*a*b*d**2*e*sqrt(-c**2*x**2 + 1)/(3*c**3) + 8*a*b*d*e**2*x**2*sqrt(-c
**2*x**2 + 1)/(25*c**3) + 12*a*b*e**3*x**4*sqrt(-c**2*x**2 + 1)/(245*c**3)
+ 16*a*b*d*e**2*sqrt(-c**2*x**2 + 1)/(25*c**5) + 16*a*b*e**3*x**2*sqrt(-c**
2*x**2 + 1)/(245*c**5) + 32*a*b*e**3*sqrt(-c**2*x**2 + 1)/(245*c**7) + b**2
*d**3*x*asin(c*x)**2 - 2*b**2*d**3*x + b**2*d**2*e*x**3*asin(c*x)**2 - 2*b*
*2*d**2*e*x**3/9 + 3*b**2*d*e**2*x**5*asin(c*x)**2/5 - 6*b**2*d*e**2*x**5/1
25 + b**2*e**3*x**7*asin(c*x)**2/7 - 2*b**2*e**3*x**7/343 + 2*b**2*d**3*sqr
t(-c**2*x**2 + 1)*asin(c*x)/c + 2*b**2*d**2*e*x**2*sqrt(-c**2*x**2 + 1)*asi
n(c*x)/(3*c) + 6*b**2*d*e**2*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/(25*c) + 2
*b**2*e**3*x**6*sqrt(-c**2*x**2 + 1)*asin(c*x)/(49*c) - 4*b**2*d**2*e*x/(3*
c**2) - 8*b**2*d*e**2*x**3/(75*c**2) - 12*b**2*e**3*x**5/(1225*c**2) + 4*b*
*2*d**2*e*sqrt(-c**2*x**2 + 1)*asin(c*x)/(3*c**3) + 8*b**2*d*e**2*x**2*sqrt
(-c**2*x**2 + 1)*asin(c*x)/(25*c**3) + 12*b**2*e**3*x**4*sqrt(-c**2*x**2 +
```

```
1)*asin(c*x)/(245*c**3) - 16*b**2*d*e**2*x/(25*c**4) - 16*b**2*e**3*x**3/(7
35*c**4) + 16*b**2*d*e**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(25*c**5) + 16*b**
2*e**3*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(245*c**5) - 32*b**2*e**3*x/(245
*c**6) + 32*b**2*e**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(245*c**7), Ne(c, 0)),
 (a**2*(d**3*x + d**2*e*x**3 + 3*d*e**2*x**5/5 + e**3*x**7/7), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 699, normalized size of antiderivative = 1.23

$$
\begin{aligned}
\int \left(d+ex^2\right)^3 (a+b\arcsin(cx))^2\,dx &= \frac{1}{7}\,b^2e^3x^7\arcsin\left(cx\right)^2 + \frac{1}{7}\,a^2e^3x^7 \\
&+ \frac{3}{5}\,b^2de^2x^5\arcsin\left(cx\right)^2 + \frac{3}{5}\,a^2de^2x^5 + b^2d^2ex^3\arcsin\left(cx\right)^2 + a^2d^2ex^3 \\
&+ b^2d^3x\arcsin\left(cx\right)^2 + \frac{2}{3}\left(3\,x^3\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abd^2e \\
&+ \frac{2}{9}\left(3\,c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\arcsin\left(cx\right) - \frac{c^2x^3+6\,x}{c^2}\right)b^2d^2e \\
&+ \frac{2}{25}\left(15\,x^5\arcsin\left(cx\right) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abde^2 \\
&+ \frac{2}{375}\left(15\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\arcsin\left(cx\right) - \frac{9\,c^4x^5+20\,c^2x^3+120}{c^4}\right. \\
&+ \frac{2}{245}\left(35\,x^7\arcsin\left(cx\right) + \left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2} + \frac{6\sqrt{-c^2x^2+1}x^4}{c^4} + \frac{8\sqrt{-c^2x^2+1}x^2}{c^6} + \frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\right. \\
&+ \frac{2}{25725}\left(105\left(\frac{5\sqrt{-c^2x^2+1}x^6}{c^2} + \frac{6\sqrt{-c^2x^2+1}x^4}{c^4} + \frac{8\sqrt{-c^2x^2+1}x^2}{c^6} + \frac{16\sqrt{-c^2x^2+1}}{c^8}\right)c\arcsin\left(cx\right) -\right. \\
&- 2\,b^2d^3\left(x - \frac{\sqrt{-c^2x^2+1}\arcsin\left(cx\right)}{c}\right) + a^2d^3x + \frac{2\left(cx\arcsin\left(cx\right) + \sqrt{-c^2x^2+1}\right)abd^3}{c}
\end{aligned}
$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/7*b^2*e^3*x^7*arcsin(c*x)^2 + 1/7*a^2*e^3*x^7 + 3/5*b^2*d*e^2*x^5*arcsin(
c*x)^2 + 3/5*a^2*d*e^2*x^5 + b^2*d^2*e*x^3*arcsin(c*x)^2 + a^2*d^2*e*x^3 +
b^2*d^3*x*arcsin(c*x)^2 + 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^
2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d^2*e + 2/9*(3*c*(sqrt(-c^2*x^2 + 1)
*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*b^2
*d^2*e + 2/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(
-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*d*e^2 + 2/375*(15*
(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*
```

```
x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3 + 120*x)/c^4)*b^2*d*e
^2 + 2/245*(35*x^7*arcsin(c*x) + (5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^
2*x^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c
^8)*c)*a*b*e^3 + 2/25725*(105*(5*sqrt(-c^2*x^2 + 1)*x^6/c^2 + 6*sqrt(-c^2*x
^2 + 1)*x^4/c^4 + 8*sqrt(-c^2*x^2 + 1)*x^2/c^6 + 16*sqrt(-c^2*x^2 + 1)/c^8)
*c*arcsin(c*x) - (75*c^6*x^7 + 126*c^4*x^5 + 280*c^2*x^3 + 1680*x)/c^6)*b^2
*e^3 - 2*b^2*d^3*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d^3*x + 2*(c*
x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d^3/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1242 vs. $2(509) = 1018$.

Time = 0.32 (sec) , antiderivative size = 1242, normalized size of antiderivative = 2.18

$$\int \left(d+ex^2\right)^3 (a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

```
[In] integrate((e*x^2+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/7*a^2*e^3*x^7 + 3/5*a^2*d*e^2*x^5 + a^2*d^2*e*x^3 + b^2*d^3*x*arcsin(c*x)
^2 + 2*a*b*d^3*x*arcsin(c*x) + (c^2*x^2 - 1)*b^2*d^2*e*x*arcsin(c*x)^2/c^2
+ a^2*d^3*x - 2*b^2*d^3*x + 2*(c^2*x^2 - 1)*a*b*d^2*e*x*arcsin(c*x)/c^2 + b
^2*d^2*e*x*arcsin(c*x)^2/c^2 + 3/5*(c^2*x^2 - 1)^2*b^2*d*e^2*x*arcsin(c*x)^
2/c^4 + 2*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c - 2/9*(c^2*x^2 - 1)*b^2*
d^2*e*x/c^2 + 2*a*b*d^2*e*x*arcsin(c*x)/c^2 + 6/5*(c^2*x^2 - 1)^2*a*b*d*e^2
*x*arcsin(c*x)/c^4 + 6/5*(c^2*x^2 - 1)*b^2*d*e^2*x*arcsin(c*x)^2/c^4 + 1/7*
(c^2*x^2 - 1)^3*b^2*e^3*x*arcsin(c*x)^2/c^6 + 2*sqrt(-c^2*x^2 + 1)*a*b*d^3/
c - 2/3*(-c^2*x^2 + 1)^(3/2)*b^2*d^2*e*arcsin(c*x)/c^3 - 14/9*b^2*d^2*e*x/c
^2 - 6/125*(c^2*x^2 - 1)^2*b^2*d*e^2*x/c^4 + 12/5*(c^2*x^2 - 1)*a*b*d*e^2*x
*arcsin(c*x)/c^4 + 2/7*(c^2*x^2 - 1)^3*a*b*e^3*x*arcsin(c*x)/c^6 + 3/5*b^2*
d*e^2*x*arcsin(c*x)^2/c^4 + 3/7*(c^2*x^2 - 1)^2*b^2*e^3*x*arcsin(c*x)^2/c^6
 - 2/3*(-c^2*x^2 + 1)^(3/2)*a*b*d^2*e/c^3 + 2*sqrt(-c^2*x^2 + 1)*b^2*d^2*e*
arcsin(c*x)/c^3 + 6/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*d*e^2*arcsin(
c*x)/c^5 - 76/375*(c^2*x^2 - 1)*b^2*d*e^2*x/c^4 - 2/343*(c^2*x^2 - 1)^3*b^2
*e^3*x/c^6 + 6/5*a*b*d*e^2*x*arcsin(c*x)/c^4 + 6/7*(c^2*x^2 - 1)^2*a*b*e^3*
x*arcsin(c*x)/c^6 + 3/7*(c^2*x^2 - 1)*b^2*e^3*x*arcsin(c*x)^2/c^6 + 2*sqrt(
-c^2*x^2 + 1)*a*b*d^2*e/c^3 + 6/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*d
*e^2/c^5 - 4/5*(-c^2*x^2 + 1)^(3/2)*b^2*d*e^2*arcsin(c*x)/c^5 + 2/49*(c^2*x
^2 - 1)^3*sqrt(-c^2*x^2 + 1)*b^2*e^3*arcsin(c*x)/c^7 - 298/375*b^2*d*e^2*x/
c^4 - 234/8575*(c^2*x^2 - 1)^2*b^2*e^3*x/c^6 + 6/7*(c^2*x^2 - 1)*a*b*e^3*x*
arcsin(c*x)/c^6 + 1/7*b^2*e^3*x*arcsin(c*x)^2/c^6 - 4/5*(-c^2*x^2 + 1)^(3/2
)*a*b*d*e^2/c^5 + 2/49*(c^2*x^2 - 1)^3*sqrt(-c^2*x^2 + 1)*a*b*e^3/c^7 + 6/5
*sqrt(-c^2*x^2 + 1)*b^2*d*e^2*arcsin(c*x)/c^5 + 6/35*(c^2*x^2 - 1)^2*sqrt(-
c^2*x^2 + 1)*b^2*e^3*arcsin(c*x)/c^7 - 1514/25725*(c^2*x^2 - 1)*b^2*e^3*x/c
^6 + 2/7*a*b*e^3*x*arcsin(c*x)/c^6 + 6/5*sqrt(-c^2*x^2 + 1)*a*b*d*e^2/c^5 +
```

```
6/35*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*e^3/c^7 - 2/7*(-c^2*x^2 + 1)^(
3/2)*b^2*e^3*arcsin(c*x)/c^7 - 4322/25725*b^2*e^3*x/c^6 - 2/7*(-c^2*x^2 + 1
)^(3/2)*a*b*e^3/c^7 + 2/7*sqrt(-c^2*x^2 + 1)*b^2*e^3*arcsin(c*x)/c^7 + 2/7*
sqrt(-c^2*x^2 + 1)*a*b*e^3/c^7
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex^2)^3 (a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,\left(e\,x^2+d\right)^3\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + e*x^2)^3,x)
[Out] int((a + b*asin(c*x))^2*(d + e*x^2)^3, x)
```

3.660 $\int (d+ex^2)^2 (a+b\arcsin(cx))^2 \, dx$

Optimal result

Integrand size = 20, antiderivative size = 335

$$\begin{aligned}\int (d+ex^2)^2 (a+b\arcsin(cx))^2 \, dx = & -2b^2d^2x - \frac{8b^2dex}{9c^2} - \frac{16b^2e^2x}{75c^4} - \frac{4}{27}b^2dex^3 - \frac{8b^2e^2x^3}{225c^2} \\ & - \frac{2}{125}b^2e^2x^5 + \frac{2bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} \\ & + \frac{8bde\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} \\ & + \frac{16be^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5} \\ & + \frac{4bdex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} \\ & + \frac{8be^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3} \\ & + \frac{2be^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} \\ & + d^2x(a+b\arcsin(cx))^2 + \frac{2}{3}dex^3(a+b\arcsin(cx))^2 \\ & + \frac{1}{5}e^2x^5(a+b\arcsin(cx))^2\end{aligned}$$

```
[Out] -2*b^2*d^2*x-8/9*b^2*d*e*x/c^2-16/75*b^2*e^2*x/c^4-4/27*b^2*d*e*x^3-8/225*b
^2*e^2*x^3/c^2-2/125*b^2*e^2*x^5+d^2*x*(a+b*arcsin(c*x))^2+2/3*d*e*x^3*(a+b
*arcsin(c*x))^2+1/5*e^2*x^5*(a+b*arcsin(c*x))^2+2*b*d^2*(a+b*arcsin(c*x))*(
-c^2*x^2+1)^(1/2)/c+8/9*b*d*e*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+16/7
5*b*e^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^5+4/9*b*d*e*x^2*(a+b*arcsin(
c*x))*(-c^2*x^2+1)^(1/2)/c+8/75*b*e^2*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1
/2)/c^3+2/25*b*e^2*x^4*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 335, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {4757, 4715, 4767, 8, 4723, 4795, 30}

$$\int (d+ex^2)^2 (a+b\arcsin(cx))^2 \, dx = \frac{2bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{4bdex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} + \frac{2be^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} + \frac{16be^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5} + \frac{8bde\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} + \frac{8be^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3} + d^2x(a+b\arcsin(cx))^2 + \frac{2}{3}dex^3(a+b\arcsin(cx))^2 + \frac{1}{5}e^2x^5(a+b\arcsin(cx))^2 - \frac{16b^2e^2x}{75c^4} - \frac{8b^2dex}{9c^2} - \frac{8b^2e^2x^3}{225c^2} - 2b^2d^2x - \frac{4}{27}b^2dex^3 - \frac{2}{125}b^2e^2x^5$$

```
[In] Int[(d + e*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*d^2*x - (8*b^2*d*e*x)/(9*c^2) - (16*b^2*e^2*x)/(75*c^4) - (4*b^2*d*e
*x^3)/27 - (8*b^2*e^2*x^3)/(225*c^2) - (2*b^2*e^2*x^5)/125 + (2*b*d^2*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (8*b*d*e*Sqrt[1 - c^2*x^2]*(a + b*Arc
Sin[c*x]))/(9*c^3) + (16*b*e^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(75*c
^5) + (4*b*d*e*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c) + (8*b*e^2*
x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(75*c^3) + (2*b*e^2*x^4*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c) + d^2*x*(a + b*ArcSin[c*x])^2 + (2*d*
e*x^3*(a + b*ArcSin[c*x])^2)/3 + (e^2*x^5*(a + b*ArcSin[c*x])^2)/5
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\text{integral} = \int \left(d^2(a+b\arcsin(cx))^2 + 2dex^2(a+b\arcsin(cx))^2 + e^2x^4(a+b\arcsin(cx))^2\right) dx$$

$$= d^2 \int (a+b\arcsin(cx))^2\,dx + (2de)\int x^2(a+b\arcsin(cx))^2\,dx + e^2\int x^4(a+b\arcsin(cx))^2\,dx$$

$$= d^2x(a+b\arcsin(cx))^2 + \frac{2}{3}dex^3(a+b\arcsin(cx))^2 + \frac{1}{5}e^2x^5(a+b\arcsin(cx))^2 - (2bcd^2)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx - \frac{1}{3}(4bcde)\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx - \frac{1}{5}(2bce^2)\int \frac{x^5(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{2bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{4bdex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} + \frac{2be^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} + d^2x(a+b\arcsin(cx))^2 + \frac{2}{3}dex^3(a+b\arcsin(cx))^2 + \frac{1}{5}e^2x^5(a+b\arcsin(cx))^2 - (2b^2d^2)\int 1\,dx - \frac{1}{9}(4b^2de)\int x^2\,dx - \frac{(8bde)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{9c} - \frac{1}{25}(2b^2e^2)\int x^4\,dx - \frac{(8be^2)\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{25c}$$

$$= -2b^2d^2x - \frac{4}{27}b^2dex^3 - \frac{2}{125}b^2e^2x^5 + \frac{2bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{8bde\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} + \frac{4bdex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} + \frac{8be^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3} + \frac{2be^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} + d^2x(a+b\arcsin(cx))^2 + \frac{2}{3}dex^3(a+b\arcsin(cx))^2 + \frac{1}{5}e^2x^5(a+b\arcsin(cx))^2 - \frac{(8b^2de)\int 1\,dx}{9c^2} - \frac{(16be^2)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{75c^3} - \frac{(8b^2e^2)\int x^2\,dx}{75c^2}$$

$$= -2b^2d^2x - \frac{8b^2dex}{9c^2} - \frac{4}{27}b^2dex^3 - \frac{8b^2e^2x^3}{225c^2} - \frac{2}{125}b^2e^2x^5 + \frac{2bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{8bde\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} + \frac{16be^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5} + \frac{4bdex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} + \frac{8be^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3} + \frac{2be^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} + d^2x(a+b\arcsin(cx))^2 + \frac{2}{3}dex^3(a+b\arcsin(cx))^2 + \frac{1}{5}e^2x^5(a+b\arcsin(cx))^2 - \frac{(16b^2e^2)\int 1\,dx}{75c^4}$$

$$= -2b^2d^2x - \frac{8b^2dex}{9c^2} - \frac{16b^2e^2x}{75c^4} - \frac{4}{27}b^2dex^3 - \frac{8b^2e^2x^3}{225c^2} - \frac{2}{125}b^2e^2x^5 + \frac{2bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{8bde\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} + \frac{16be^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5} + \frac{4bdex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} + \frac{8be^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3} + \frac{2be^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} + d^2x(a+b\arcsin(cx))^2 + \frac{2}{3}dex^3(a+b\arcsin(cx))^2 + \frac{1}{5}e^2x^5(a+b\arcsin(cx))^2$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 291, normalized size of antiderivative = 0.87

$$\int (d+ex^2)^2 (a+b\arcsin(cx))^2 \, dx$$

$$= \frac{225a^2c^5x(15d^2+10dex^2+3e^2x^4)+30ab\sqrt{1-c^2x^2}(24e^2+4c^2e(25d+3ex^2)+c^4(225d^2+50dex^2+9e^2x^4}{}$$

```
[In] Integrate[(d + e*x^2)^2*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] (225*a^2*c^5*x*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4) + 30*a*b*Sqrt[1 - c^2*x^2]
*(24*e^2 + 4*c^2*e*(25*d + 3*e*x^2) + c^4*(225*d^2 + 50*d*e*x^2 + 9*e^2*x^4
)) - 2*b^2*c*x*(360*e^2 + 60*c^2*e*(25*d + e*x^2) + c^4*(3375*d^2 + 250*d*e
*x^2 + 27*e^2*x^4)) + 30*b*(15*a*c^5*x*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4) +
b*Sqrt[1 - c^2*x^2]*(24*e^2 + 4*c^2*e*(25*d + 3*e*x^2) + c^4*(225*d^2 + 50*
d*e*x^2 + 9*e^2*x^4)))*ArcSin[c*x] + 225*b^2*c^5*x*(15*d^2 + 10*d*e*x^2 + 3
*e^2*x^4)*ArcSin[c*x]^2)/(3375*c^5)
```

Maple [A] (verified)

Time = 0.30 (sec) , antiderivative size = 442, normalized size of antiderivative = 1.32

method	result
derivativedivides	$\frac{\frac{a^2\left(d^2c^5x+\frac{2}{3}dc^5ex^3+\frac{1}{5}e^2c^5x^5\right)}{c^4}+\frac{b^2\left(c^4d^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{2c^2de\left(9c^3x^3\arcsin(cx)^2+6\sqrt{-c^2x^2+1}\cdots\right.}{\cdots}\cdots\right.}{\cdots}}{\cdots}$
default	$\frac{\frac{a^2\left(d^2c^5x+\frac{2}{3}dc^5ex^3+\frac{1}{5}e^2c^5x^5\right)}{c^4}+\frac{b^2\left(c^4d^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{2c^2de\left(9c^3x^3\arcsin(cx)^2+6\sqrt{-c^2x^2+1}\cdots\right.}{\cdots}\cdots\right.}{\cdots}}{\cdots}$
parts	$a^2\left(\frac{1}{5}e^2x^5+\frac{2}{3}dex^3+d^2x\right)+\frac{b^2\left(675\arcsin(cx)^2c^5x^5e^2+2250\arcsin(cx)^2c^5x^3de+3375\arcsin(cx)^2c^5xd^2+270\cdots\right.}{\cdots}$

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(a^2/c^4*(d^2*c^5*x+2/3*d*c^5*e*x^3+1/5*e^2*c^5*x^5)+b^2/c^4*(c^4*d^2*(
c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2))+2/27*c^2*d*e*(9*c
^3*x^3*arcsin(c*x)^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*
arcsin(c*x)*(-c^2*x^2+1)^(1/2)-12*c*x)+1/1125*e^2*(225*arcsin(c*x)^2*c^5*x^
5+90*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4*c^4-18*c^5*x^5+120*(-c^2*x^2+1)^(1/
2)*arcsin(c*x)*x^2*c^2-40*c^3*x^3+240*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-240*c*
x))+2*a*b/c^4*(arcsin(c*x)*d^2*c^5*x+2/3*arcsin(c*x)*d*c^5*e*x^3+1/5*arcsin
(c*x)*e^2*c^5*x^5-1/5*e^2*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c
^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))+d^2*c^4*(-c^2*x^2+1)^(1/2)-2/3*d*c
^2*e*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 349, normalized size of antiderivative = 1.04

$$\int \left(d+ex^2\right)^2 (a+b\arcsin(cx))^2\,dx = \frac{27\,(25\,a^2-2\,b^2)c^5e^2x^5+10\,(25\,(9\,a^2-2\,b^2)c^5de-12\,b^2c^3e^2)x^3+225\,(3\,b^2c^5e^2x^5+10\,b^2c^5dex^3+15\,b^2c^5d^2\cdots}{\cdots}$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/3375*(27*(25*a^2 - 2*b^2)*c^5*e^2*x^5 + 10*(25*(9*a^2 - 2*b^2)*c^5*d*e -
12*b^2*c^3*e^2)*x^3 + 225*(3*b^2*c^5*e^2*x^5 + 10*b^2*c^5*d*e*x^3 + 15*b^2*
c^5*d^2*x)*arcsin(c*x)^2 + 15*(225*(a^2 - 2*b^2)*c^5*d^2 - 200*b^2*c^3*d*e
- 48*b^2*c*e^2)*x + 450*(3*a*b*c^5*e^2*x^5 + 10*a*b*c^5*d*e*x^3 + 15*a*b*c^
```

```
5*d^2*x)*arcsin(c*x) + 30*(9*a*b*c^4*e^2*x^4 + 225*a*b*c^4*d^2 + 100*a*b*c^
2*d*e + 24*a*b*e^2 + 2*(25*a*b*c^4*d*e + 6*a*b*c^2*e^2)*x^2 + (9*b^2*c^4*e^
2*x^4 + 225*b^2*c^4*d^2 + 100*b^2*c^2*d*e + 24*b^2*e^2 + 2*(25*b^2*c^4*d*e
+ 6*b^2*c^2*e^2)*x^2)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [A] (verification not implemented)

Time = 0.54 (sec) , antiderivative size = 595, normalized size of antiderivative = 1.78

$$\int (d+ex^2)^2 (a+b\arcsin(cx))^2 dx = \begin{cases} a^2d^2x + \frac{2a^2dex^3}{3} + \frac{a^2e^2x^5}{5} + 2abd^2x\,\mathrm{asin}\,(cx) + \frac{4abdex^3\,\mathrm{asin}\,(cx)}{3} + \frac{2abe^2x^5\,\mathrm{asin}\,(cx)}{5} + \frac{2abd^2\sqrt{-c^2x^2+1}}{c} + \frac{4abdex^2\sqrt{-c^2}}{9c} \\ a^2\left(d^2x + \frac{2dex^3}{3} + \frac{e^2x^5}{5}\right) \end{cases}$$

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d**2*x + 2*a**2*d*e*x**3/3 + a**2*e**2*x**5/5 + 2*a*b*d**2*
x*asin(c*x) + 4*a*b*d*e*x**3*asin(c*x)/3 + 2*a*b*e**2*x**5*asin(c*x)/5 + 2*
a*b*d**2*sqrt(-c**2*x**2 + 1)/c + 4*a*b*d*e*x**2*sqrt(-c**2*x**2 + 1)/(9*c)
 + 2*a*b*e**2*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + 8*a*b*d*e*sqrt(-c**2*x**2
+ 1)/(9*c**3) + 8*a*b*e**2*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 16*a*b*e**
2*sqrt(-c**2*x**2 + 1)/(75*c**5) + b**2*d**2*x*asin(c*x)**2 - 2*b**2*d**2*x
 + 2*b**2*d*e*x**3*asin(c*x)**2/3 - 4*b**2*d*e*x**3/27 + b**2*e**2*x**5*asi
n(c*x)**2/5 - 2*b**2*e**2*x**5/125 + 2*b**2*d**2*sqrt(-c**2*x**2 + 1)*asin(
c*x)/c + 4*b**2*d*e*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c) + 2*b**2*e**2
*x**4*sqrt(-c**2*x**2 + 1)*asin(c*x)/(25*c) - 8*b**2*d*e*x/(9*c**2) - 8*b**
2*e**2*x**3/(225*c**2) + 8*b**2*d*e*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c**3)
 + 8*b**2*e**2*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(75*c**3) - 16*b**2*e**2
*x/(75*c**4) + 16*b**2*e**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(75*c**5), Ne(c,
 0)), (a**2*(d**2*x + 2*d*e*x**3/3 + e**2*x**5/5), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 437, normalized size of antiderivative = 1.30

$$
\begin{aligned}
&\int \left(d+ex^2\right)^2 (a+b\arcsin(cx))^2\,dx \\
&= \frac{1}{5}\,b^2e^2x^5\arcsin\left(cx\right)^2 + \frac{1}{5}\,a^2e^2x^5 + \frac{2}{3}\,b^2dex^3\arcsin\left(cx\right)^2 + \frac{2}{3}\,a^2dex^3 + b^2d^2x\arcsin\left(cx\right)^2 \\
&\quad + \frac{4}{9}\left(3\,x^3\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)abde \\
&\quad + \frac{4}{27}\left(3\,c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\arcsin\left(cx\right) - \frac{c^2x^3+6\,x}{c^2}\right)b^2de \\
&\quad + \frac{2}{75}\left(15\,x^5\arcsin\left(cx\right) + \left(\frac{3\,\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\,\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\,\sqrt{-c^2x^2+1}}{c^6}\right)c\right)abe^2 \\
&\quad + \frac{2}{1125}\left(15\left(\frac{3\,\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\,\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\,\sqrt{-c^2x^2+1}}{c^6}\right)c\arcsin\left(cx\right) - \frac{9\,c^4x^5+20\,c^2x^3+120}{c^4}\right. \\
&\quad - 2\,b^2d^2\left(x - \frac{\sqrt{-c^2x^2+1}\arcsin\left(cx\right)}{c}\right) + a^2d^2x + \frac{2\left(cx\arcsin\left(cx\right)+\sqrt{-c^2x^2+1}\right)abd^2}{c}
\end{aligned}
$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/5*b^2*e^2*x^5*arcsin(c*x)^2 + 1/5*a^2*e^2*x^5 + 2/3*b^2*d*e*x^3*arcsin(c*
x)^2 + 2/3*a^2*d*e*x^3 + b^2*d^2*x*arcsin(c*x)^2 + 4/9*(3*x^3*arcsin(c*x) +
 c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d*e + 4/27*
(3*c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4)*arcsin(c*x) -
(c^2*x^3 + 6*x)/c^2)*b^2*d*e + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2
+ 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*
a*b*e^2 + 2/1125*(15*(3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x
^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c*arcsin(c*x) - (9*c^4*x^5 + 20*c^2*x^3
+ 120*x)/c^4)*b^2*e^2 - 2*b^2*d^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) +
a^2*d^2*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d^2/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 683 vs. 2(299) = 598.

Time = 0.32 (sec) , antiderivative size = 683, normalized size of antiderivative = 2.04

$$\int \left(d+ex^2\right)^2 (a+b\arcsin(cx))^2\,dx = \frac{1}{5}\,a^2e^2x^5 + \frac{2}{3}\,a^2dex^3 + b^2d^2x\arcsin\left(cx\right)^2 + 2\,abd^2x\arcsin\left(cx\right) + \frac{2\,(c^2x^2-1)b^2dex\arcsin\left(cx\right)^2}{3\,c^2} + a^2d^2x - 2\,b^2d^2x + \frac{4\,(c^2x^2-1)abdex\arcsin\left(cx\right)}{3\,c^2} + \frac{2\,b^2dex\arcsin\left(cx\right)^2}{3\,c^2} + \frac{\left(c^2x^2-1\right)^2b^2e^2x\arcsin\left(cx\right)^2}{5\,c^4} + \frac{2\,\sqrt{-c^2x^2+1}b^2d^2\arcsin\left(cx\right)}{c} - \frac{4\,(c^2x^2-1)b^2dex}{27\,c^2} + \frac{4\,abdex\arcsin\left(cx\right)}{3\,c^2} + \frac{2\,\left(c^2x^2-1\right)^2abe^2x\arcsin\left(cx\right)}{5\,c^4} + \frac{2\,(c^2x^2-1)b^2e^2x\arcsin\left(cx\right)^2}{5\,c^4} + \frac{2\,\sqrt{-c^2x^2+1}abd^2}{c} - \frac{4\,\left(-c^2x^2+1\right)^{\frac{3}{2}}b^2de\arcsin\left(cx\right)}{9\,c^3} - \frac{28\,b^2dex}{27\,c^2} - \frac{2\,\left(c^2x^2-1\right)^2b^2e^2x}{125\,c^4} + \frac{4\,(c^2x^2-1)abe^2x\arcsin\left(cx\right)}{5\,c^4} + \frac{b^2e^2x\arcsin\left(cx\right)^2}{5\,c^4} - \frac{4\,\left(-c^2x^2+1\right)^{\frac{3}{2}}abde}{9\,c^3} + \frac{4\,\sqrt{-c^2x^2+1}b^2de\arcsin\left(cx\right)}{3\,c^3} + \frac{2\,\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}b^2e^2\arcsin\left(cx\right)}{25\,c^5} - \frac{76\,(c^2x^2-1)b^2e^2x}{1125\,c^4} + \frac{2\,abe^2x\arcsin\left(cx\right)}{5\,c^4} + \frac{4\,\sqrt{-c^2x^2+1}abde}{3\,c^3} + \frac{2\,\left(c^2x^2-1\right)^2\sqrt{-c^2x^2+1}abe^2}{25\,c^5} - \frac{4\,\left(-c^2x^2+1\right)^{\frac{3}{2}}b^2e^2\arcsin\left(cx\right)}{15\,c^5} - \frac{298\,b^2e^2x}{1125\,c^4} - \frac{4\,\left(-c^2x^2+1\right)^{\frac{3}{2}}abe^2}{15\,c^5} + \frac{2\,\sqrt{-c^2x^2+1}b^2e^2\arcsin\left(cx\right)}{5\,c^5} + \frac{2\,\sqrt{-c^2x^2+1}abe^2}{5\,c^5}$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/5*a^2*e^2*x^5 + 2/3*a^2*d*e*x^3 + b^2*d^2*x*arcsin(c*x)^2 + 2*a*b*d^2*x*a
rcsin(c*x) + 2/3*(c^2*x^2 - 1)*b^2*d*e*x*arcsin(c*x)^2/c^2 + a^2*d^2*x - 2*
b^2*d^2*x + 4/3*(c^2*x^2 - 1)*a*b*d*e*x*arcsin(c*x)/c^2 + 2/3*b^2*d*e*x*arc
sin(c*x)^2/c^2 + 1/5*(c^2*x^2 - 1)^2*b^2*e^2*x*arcsin(c*x)^2/c^4 + 2*sqrt(-
c^2*x^2 + 1)*b^2*d^2*arcsin(c*x)/c - 4/27*(c^2*x^2 - 1)*b^2*d*e*x/c^2 + 4/3
*a*b*d*e*x*arcsin(c*x)/c^2 + 2/5*(c^2*x^2 - 1)^2*a*b*e^2*x*arcsin(c*x)/c^4
+ 2/5*(c^2*x^2 - 1)*b^2*e^2*x*arcsin(c*x)^2/c^4 + 2*sqrt(-c^2*x^2 + 1)*a*b*
d^2/c - 4/9*(-c^2*x^2 + 1)^(3/2)*b^2*d*e*arcsin(c*x)/c^3 - 28/27*b^2*d*e*x/
c^2 - 2/125*(c^2*x^2 - 1)^2*b^2*e^2*x/c^4 + 4/5*(c^2*x^2 - 1)*a*b*e^2*x*arc
sin(c*x)/c^4 + 1/5*b^2*e^2*x*arcsin(c*x)^2/c^4 - 4/9*(-c^2*x^2 + 1)^(3/2)*a
*b*d*e/c^3 + 4/3*sqrt(-c^2*x^2 + 1)*b^2*d*e*arcsin(c*x)/c^3 + 2/25*(c^2*x^2
 - 1)^2*sqrt(-c^2*x^2 + 1)*b^2*e^2*arcsin(c*x)/c^5 - 76/1125*(c^2*x^2 - 1)*
b^2*e^2*x/c^4 + 2/5*a*b*e^2*x*arcsin(c*x)/c^4 + 4/3*sqrt(-c^2*x^2 + 1)*a*b*
d*e/c^3 + 2/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*a*b*e^2/c^5 - 4/15*(-c^2*
x^2 + 1)^(3/2)*b^2*e^2*arcsin(c*x)/c^5 - 298/1125*b^2*e^2*x/c^4 - 4/15*(-c^
2*x^2 + 1)^(3/2)*a*b*e^2/c^5 + 2/5*sqrt(-c^2*x^2 + 1)*b^2*e^2*arcsin(c*x)/c
^5 + 2/5*sqrt(-c^2*x^2 + 1)*a*b*e^2/c^5
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex^2)^2 (a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,\left(e\,x^2+d\right)^2\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + e*x^2)^2,x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + e*x^2)^2, x)
```

3.661 $\int (d+ex^2)(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 18, antiderivative size = 156

$$\int (d+ex^2)(a+b\arcsin(cx))^2\,dx = -2b^2dx-\frac{4b^2ex}{9c^2}-\frac{2}{27}b^2ex^3+\frac{2bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{4be\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3}+\frac{2bex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c}+dx(a+b\arcsin(cx))^2+\frac{1}{3}ex^3(a+b\arcsin(cx))^2$$

```
[Out] -2*b^2*d*x-4/9*b^2*e*x/c^2-2/27*b^2*e*x^3+d*x*(a+b*arcsin(c*x))^2+1/3*e*x^3
*(a+b*arcsin(c*x))^2+2*b*d*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+4/9*b*e*(
a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+2/9*b*e*x^2*(a+b*arcsin(c*x))*(-c^2
*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used

$= \{4757, 4715, 4767, 8, 4723, 4795, 30\}$

$$\int \left(d+ex^2\right)\left(a+b\arcsin(cx)\right)^2 dx = \frac{2bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{2bex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} + \frac{4be\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} + dx(a+b\arcsin(cx))^2 + \frac{1}{3}ex^3(a+b\arcsin(cx))^2 - \frac{4b^2ex}{9c^2} - 2b^2dx - \frac{2}{27}b^2ex^3$$

```
[In] Int[(d + e*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*d*x - (4*b^2*e*x)/(9*c^2) - (2*b^2*e*x^3)/27 + (2*b*d*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x]))/c + (4*b*e*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
(9*c^3) + (2*b*e*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c) + d*x*(a
+ b*ArcSin[c*x])^2 + (e*x^3*(a + b*ArcSin[c*x])^2)/3
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4723

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Dist[b*c*(n
/(d*(m + 1))), Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*
x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
```

```
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(d(a+b\arcsin(cx))^2+ex^2(a+b\arcsin(cx))^2\right)\,dx\\
&= d\int (a+b\arcsin(cx))^2\,dx+e\int x^2(a+b\arcsin(cx))^2\,dx\\
&= dx(a+b\arcsin(cx))^2+\frac{1}{3}ex^3(a+b\arcsin(cx))^2\\
&\quad-(2bcd)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{3}(2bce)\int \frac{x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx\\
&= \frac{2bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{2bex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c}+dx(a+b\arcsin(cx))^2\\
&\quad+\frac{1}{3}ex^3(a+b\arcsin(cx))^2-\left(2b^2d\right)\int 1\,dx-\frac{1}{9}\left(2b^2e\right)\int x^2\,dx-\frac{(4be)\int \frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx}{9c}\\
&= -2b^2dx-\frac{2}{27}b^2ex^3+\frac{2bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\\
&\quad+\frac{4be\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3}+\frac{2bex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c}\\
&\quad+dx(a+b\arcsin(cx))^2+\frac{1}{3}ex^3(a+b\arcsin(cx))^2-\frac{(4b^2e)\int 1\,dx}{9c^2}
\end{aligned}
$$

$$= -2b^2dx - \frac{4b^2ex}{9c^2} - \frac{2}{27}b^2ex^3 + \frac{2bd\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{4be\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} + \frac{2bex^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} + dx(a+b\arcsin(cx))^2 + \frac{1}{3}ex^3(a+b\arcsin(cx))^2$$

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.95

$$\int (d+ex^2)(a+b\arcsin(cx))^2\,dx = dx(a+b\arcsin(cx))^2 + \frac{1}{3}ex^3(a+b\arcsin(cx))^2 - 2bd\left(bx - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right) - \frac{2}{27}be\left(bx^3 - \frac{3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{6\left(\frac{bx}{c} - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^2}\right)}{c}\right)$$

```
[In] Integrate[(d + e*x^2)*(a + b*ArcSin[c*x])^2,x]
```

```
[Out] d*x*(a + b*ArcSin[c*x])^2 + (e*x^3*(a + b*ArcSin[c*x])^2)/3 - 2*b*d*(b*x -
(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c) - (2*b*e*(b*x^3 - (3*x^2*Sqrt[1
- c^2*x^2]*(a + b*ArcSin[c*x]))/c + (6*((b*x)/c - (Sqrt[1 - c^2*x^2]*(a + b
*ArcSin[c*x]))/c^2))/c))/27
```

Maple [A] (verified)

Time = 0.24 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.42

method	result
parts	$a^2\left(\frac{1}{3}x^3e+dx\right)+\frac{b^2\left(\frac{e\left(9c^3x^3\arcsin(cx)^2+6\sqrt{-c^2x^2+1}\,\arcsin(cx)x^2c^2-2c^3x^3+12\arcsin(cx)\sqrt{-c^2x^2+1}-12cx\right)}{27c^2}+d\left(cx\,a\right.}{c}$
derivativedivides	$\frac{\frac{a^2\left(d\,c^3x+\frac{1}{3}e\,c^3x^3\right)}{c^2}+\frac{b^2\left(d\,c^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{e\left(9c^3x^3\arcsin(cx)^2+6\sqrt{-c^2x^2+1}\,\arcsin(cx)x^2c^2-\right.}{27}\right.}{c^2}}{}$
default	$\frac{\frac{a^2\left(d\,c^3x+\frac{1}{3}e\,c^3x^3\right)}{c^2}+\frac{b^2\left(d\,c^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{e\left(9c^3x^3\arcsin(cx)^2+6\sqrt{-c^2x^2+1}\,\arcsin(cx)x^2c^2-\right.}{27}\right.}{c^2}}{}$

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] a^2*(1/3*x^3*e+d*x)+b^2/c*(1/27*e*(9*c^3*x^3*arcsin(c*x)^2+6*(-c^2*x^2+1)^(
1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-12*c*x
)/c^2+d*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)))+2*a*b/c
*(1/3*c*arcsin(c*x)*x^3*e+arcsin(c*x)*d*c*x-1/3/c^2*(e*(-1/3*c^2*x^2*(-c^2*
x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-3*d*c^2*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.13

$$\int (d+ex^2)\,(a+b\arcsin(cx))^2\,dx$$
$$=\frac{(9\,a^2-2\,b^2)c^3ex^3+9\,(b^2c^3ex^3+3\,b^2c^3dx)\arcsin{(cx)}^2+3\,(9\,(a^2-2\,b^2)c^3d-4\,b^2ce)x+18\,(abc^3ex^3+3\,a}{27\,c}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/27*((9*a^2 - 2*b^2)*c^3*e*x^3 + 9*(b^2*c^3*e*x^3 + 3*b^2*c^3*d*x)*arcsin(
c*x)^2 + 3*(9*(a^2 - 2*b^2)*c^3*d - 4*b^2*c*e)*x + 18*(a*b*c^3*e*x^3 + 3*a*
b*c^3*d*x)*arcsin(c*x) + 6*(a*b*c^2*e*x^2 + 9*a*b*c^2*d + 2*a*b*e + (b^2*c^
2*e*x^2 + 9*b^2*c^2*d + 2*b^2*e)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 279, normalized size of antiderivative = 1.79

$$\int (d+ex^2)(a+b\arcsin(cx))^2\,dx$$
$$= \begin{cases} a^2dx + \frac{a^2ex^3}{3} + 2abdx\,\mathrm{asin}\,(cx) + \frac{2abex^3\,\mathrm{asin}\,(cx)}{3} + \frac{2abd\sqrt{-c^2x^2+1}}{c} + \frac{2abex^2\sqrt{-c^2x^2+1}}{9c} + \frac{4abe\sqrt{-c^2x^2+1}}{9c^3} + b^2dx\,\mathrm{asin}^2 \\ a^2\left(dx + \frac{ex^3}{3}\right) \end{cases}$$

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d*x + a**2*e*x**3/3 + 2*a*b*d*x*asin(c*x) + 2*a*b*e*x**3*as
in(c*x)/3 + 2*a*b*d*sqrt(-c**2*x**2 + 1)/c + 2*a*b*e*x**2*sqrt(-c**2*x**2 +
 1)/(9*c) + 4*a*b*e*sqrt(-c**2*x**2 + 1)/(9*c**3) + b**2*d*x*asin(c*x)**2 -
 2*b**2*d*x + b**2*e*x**3*asin(c*x)**2/3 - 2*b**2*e*x**3/27 + 2*b**2*d*sqrt
(-c**2*x**2 + 1)*asin(c*x)/c + 2*b**2*e*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)
/(9*c) - 4*b**2*e*x/(9*c**2) + 4*b**2*e*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c
**3), Ne(c, 0)), (a**2*(d*x + e*x**3/3), True))
```

Maxima [A] (verification not implemented)

none

Time = 0.28 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.42

$$\int (d+ex^2)(a+b\arcsin(cx))^2\,dx$$
$$= \frac{1}{3}b^2ex^3\arcsin(cx)^2 + \frac{1}{3}a^2ex^3 + b^2dx\arcsin(cx)^2 + \frac{2}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)abe + \frac{2}{27}\left(3c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\arcsin(cx) - \frac{c^2x^3+6x}{c^2}\right)b^2e - 2b^2d\left(x - \frac{\sqrt{-c^2x^2+1}\arcsin(cx)}{c}\right) + a^2dx + \frac{2\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)abd}{c}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/3*b^2*e*x^3*arcsin(c*x)^2 + 1/3*a^2*e*x^3 + b^2*d*x*arcsin(c*x)^2 + 2/9*(
3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^
4))*a*b*e + 2/27*(3*c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^
4)*arcsin(c*x) - (c^2*x^3 + 6*x)/c^2)*b^2*e - 2*b^2*d*(x - sqrt(-c^2*x^2 +
1)*arcsin(c*x)/c) + a^2*d*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*
d/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 285 vs. $2(140) = 280$.

Time = 0.32 (sec) , antiderivative size = 285, normalized size of antiderivative = 1.83

$$\int (d+ex^2)(a+b\arcsin(cx))^2\,dx = \frac{1}{3}a^2ex^3 + b^2dx\arcsin(cx)^2 + 2abdx\arcsin(cx) + \frac{(c^2x^2-1)b^2ex\arcsin(cx)^2}{3c^2} + a^2dx - 2b^2dx + \frac{2(c^2x^2-1)abex\arcsin(cx)}{3c^2} + \frac{b^2ex\arcsin(cx)^2}{3c^2} + \frac{2\sqrt{-c^2x^2+1}b^2d\arcsin(cx)}{c} - \frac{2(c^2x^2-1)b^2ex}{27c^2} + \frac{2abex\arcsin(cx)}{3c^2} + \frac{2\sqrt{-c^2x^2+1}abd}{c} - \frac{2(-c^2x^2+1)^{\frac{3}{2}}b^2e\arcsin(cx)}{9c^3} - \frac{14b^2ex}{27c^2} - \frac{2(-c^2x^2+1)^{\frac{3}{2}}abe}{9c^3} + \frac{2\sqrt{-c^2x^2+1}b^2e\arcsin(cx)}{3c^3} + \frac{2\sqrt{-c^2x^2+1}abe}{3c^3}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] 1/3*a^2*e*x^3 + b^2*d*x*arcsin(c*x)^2 + 2*a*b*d*x*arcsin(c*x) + 1/3*(c^2*x^
2 - 1)*b^2*e*x*arcsin(c*x)^2/c^2 + a^2*d*x - 2*b^2*d*x + 2/3*(c^2*x^2 - 1)*
a*b*e*x*arcsin(c*x)/c^2 + 1/3*b^2*e*x*arcsin(c*x)^2/c^2 + 2*sqrt(-c^2*x^2 +
 1)*b^2*d*arcsin(c*x)/c - 2/27*(c^2*x^2 - 1)*b^2*e*x/c^2 + 2/3*a*b*e*x*arcs
in(c*x)/c^2 + 2*sqrt(-c^2*x^2 + 1)*a*b*d/c - 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*e
*arcsin(c*x)/c^3 - 14/27*b^2*e*x/c^2 - 2/9*(-c^2*x^2 + 1)^(3/2)*a*b*e/c^3 +
 2/3*sqrt(-c^2*x^2 + 1)*b^2*e*arcsin(c*x)/c^3 + 2/3*sqrt(-c^2*x^2 + 1)*a*b*
e/c^3
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex^2)(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,(e\,x^2+d)\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + e*x^2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + e*x^2), x)
```

3.662 $\int (a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 10, antiderivative size = 47

$$\int (a+b\arcsin(cx))^2\,dx=-2b^2x+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+x(a+b\arcsin(cx))^2$$

```
[Out] -2*b^2*x+x*(a+b*arcsin(c*x))^2+2*b*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}=0.300$, Rules used = {4715, 4767, 8}

$$\int (a+b\arcsin(cx))^2\,dx=\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+x(a+b\arcsin(cx))^2-2b^2x$$

```
[In] Int[(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -2*b^2*x + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + x*(a + b*ArcSin[
c*x])^2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\text{integral} &= x(a+b\arcsin(cx))^2-(2bc)\int\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\,dx\\ &= \frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+x(a+b\arcsin(cx))^2-\left(2b^2\right)\int 1\,dx\\ &= -2b^2x+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+x(a+b\arcsin(cx))^2\end{aligned}$$

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00

$$\int(a+b\arcsin(cx))^2\,dx=-2b^2x+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+x(a+b\arcsin(cx))^2$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2,x]
[Out] -2*b^2*x + (2*b*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + x*(a + b*ArcSin[
c*x])^2
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.53

method	result	size
derivativedivides	$\frac{cx\,a^2+b^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+2ab\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$	72
default	$\frac{cx\,a^2+b^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+2ab\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$	72
parts	$a^2x+\frac{b^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)}{c}+\frac{2ab\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$	73

```
[In] int((a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(c*x*a^2+b^2*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2))
+2*a*b*(c*x*arcsin(c*x)+(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

none

Time = 0.26 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.38

$$\int (a+b\arcsin(cx))^2\,dx = \frac{b^2cx\arcsin{(cx)}^2 + 2\,abcx\arcsin{(cx)} + (a^2-2\,b^2)cx + 2\,\sqrt{-c^2x^2+1}(b^2\arcsin{(cx)}+ab)}{c}$$

```
[In] integrate((a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

```
[Out] (b^2*c*x*arcsin(c*x)^2 + 2*a*b*c*x*arcsin(c*x) + (a^2 - 2*b^2)*c*x + 2*sqrt
(-c^2*x^2 + 1)*(b^2*arcsin(c*x) + a*b))/c
```

Sympy [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.74

$$\int (a+b\arcsin(cx))^2\,dx = \begin{cases} a^2x + 2abx\operatorname{asin}{(cx)} + \frac{2ab\sqrt{-c^2x^2+1}}{c} + b^2x\operatorname{asin}^2{(cx)} - 2b^2x + \frac{2b^2\sqrt{-c^2x^2+1}\operatorname{asin}{(cx)}}{c} & \text{for}\ c\neq 0 \\ a^2x & \text{otherwise} \end{cases}$$

```
[In] integrate((a+b*asin(c*x))**2,x)
```

```
[Out] Piecewise((a**2*x + 2*a*b*x*asin(c*x) + 2*a*b*sqrt(-c**2*x**2 + 1)/c + b**2
*x*asin(c*x)**2 - 2*b**2*x + 2*b**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/c, Ne(c,
 0)), (a**2*x, True))
```

Maxima [A] (verification not implemented)

none

Time = 0.27 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.53

$$\int (a+b\arcsin(cx))^2\,dx = b^2x\arcsin{(cx)}^2 - 2\,b^2\left(x - \frac{\sqrt{-c^2x^2+1}\arcsin{(cx)}}{c}\right) + a^2x + \frac{2\left(cx\arcsin{(cx)}+\sqrt{-c^2x^2+1}\right)ab}{c}$$

```
[In] integrate((a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] b^2*x*arcsin(c*x)^2 - 2*b^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*x
+ 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b/c
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.60

$$\int (a+b\arcsin(cx))^2\,dx = b^2x\arcsin{(cx)}^2 + 2\,abx\arcsin{(cx)} + a^2x - 2\,b^2x + \frac{2\sqrt{-c^2x^2+1}b^2\arcsin{(cx)}}{c} + \frac{2\sqrt{-c^2x^2+1}ab}{c}$$

```
[In] integrate((a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) + a^2*x - 2*b^2*x + 2*sqrt(-c^2*x
^2 + 1)*b^2*arcsin(c*x)/c + 2*sqrt(-c^2*x^2 + 1)*a*b/c
```

Mupad [B] (verification not implemented)

Time = 0.55 (sec) , antiderivative size = 142, normalized size of antiderivative = 3.02

$$\int (a+b\arcsin(cx))^2\,dx = \begin{cases} b^2\left(x\left(\mathrm{asin}(c\,x)^2-2\right)+2\,\mathrm{asin}(c\,x)\,\sqrt{\frac{1}{c^2}-x^2}\right)+a^2\,x+\frac{2\,a\,b\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c} & \text{if } 0<c \\ a^2\,x+b^2\,x\,\left(\mathrm{asin}(c\,x)^2-2\right)+\frac{2\,b^2\,\mathrm{asin}(c\,x)\,\sqrt{1-c^2\,x^2}}{c}+\frac{2\,a\,b\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c} & \text{if } \neg 0<c \end{cases}$$

```
[In] int((a + b*asin(c*x))^2,x)
```

```
[Out] piecewise(0 < c, b^2*(x*(asin(c*x)^2 - 2) + 2*asin(c*x)*(1/c^2 - x^2)^(1/2)
) + a^2*x + (2*a*b*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)))/c, ~0 < c, a^2*
x + b^2*x*(asin(c*x)^2 - 2) + (2*b^2*asin(c*x)*(- c^2*x^2 + 1)^(1/2))/c + (
2*a*b*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)))/c)
```

3.663 $\int \frac{(a+b\arcsin(cx))^2}{d+ex^2}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 821

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex^2}\,dx = \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{(a+b\arcsin(cx))^2\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{(a+b\arcsin(cx))^2\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} - \frac{b^2\operatorname{PolyLog}\left(3,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} + \frac{b^2\operatorname{PolyLog}\left(3,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} - \frac{b^2\operatorname{PolyLog}\left(3,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} + \frac{b^2\operatorname{PolyLog}\left(3,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}}$$

```
[Out] 1/2*(a+b*arcsin(c*x))^2*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(
1/2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)-1/2*(a+b*arcsin(c*x))^2*ln(1+(I*c
*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)
/e^(1/2)+1/2*(a+b*arcsin(c*x))^2*ln(1-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I
*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)-1/2*(a+b*arcsin(c*x))^2*
ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(
```

```
-d)^(1/2)/e^(1/2)+I*b*(a+b*arcsin(c*x))*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2
))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)-I*b*(a+b*ar
csin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^
2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)+I*b*(a+b*arcsin(c*x))*polylog(2,-(I*c*x+(
-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(
1/2)-I*b*(a+b*arcsin(c*x))*polylog(2,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*
c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)-b^2*polylog(3,-(I*c*x+(-c
^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/
2)+b^2*polylog(3,(I*c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)-(c^2*d+
e)^(1/2)))/(-d)^(1/2)/e^(1/2)-b^2*polylog(3,-(I*c*x+(-c^2*x^2+1)^(1/2))*e^(
1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2)/e^(1/2)+b^2*polylog(3,(I*
c*x+(-c^2*x^2+1)^(1/2))*e^(1/2)/(I*c*(-d)^(1/2)+(c^2*d+e)^(1/2)))/(-d)^(1/2
)/e^(1/2)
```

Rubi [A] (verified)

Time = 0.91 (sec) , antiderivative size = 821, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.350$, Rules used

$= \{4757, 4825, 4617, 2221, 2611, 2320, 6724\}$

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex^2}\,dx = -\frac{\text{PolyLog}\left(3,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)b^2}{\sqrt{-d}\sqrt{e}} + \frac{\text{PolyLog}\left(3,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)b^2}{\sqrt{-d}\sqrt{e}} - \frac{\text{PolyLog}\left(3,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)b^2}{\sqrt{-d}\sqrt{e}} + \frac{\text{PolyLog}\left(3,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)b^2}{\sqrt{-d}\sqrt{e}} + \frac{i(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)b}{\sqrt{-d}\sqrt{e}} - \frac{i(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)b}{\sqrt{-d}\sqrt{e}} + \frac{i(a+b\arcsin(cx))\,\text{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)b}{\sqrt{-d}\sqrt{e}} - \frac{i(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)b}{\sqrt{-d}\sqrt{e}} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{dc^2+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{(a+b\arcsin(cx))^2\log\left(\frac{e^{i\arcsin(cx)}\sqrt{e}}{ic\sqrt{-d}-\sqrt{dc^2+e}}+1\right)}{2\sqrt{-d}\sqrt{e}} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{i\sqrt{-d}c+\sqrt{dc^2+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{(a+b\arcsin(cx))^2\log\left(\frac{e^{i\arcsin(cx)}\sqrt{e}}{i\sqrt{-d}c+\sqrt{dc^2+e}}+1\right)}{2\sqrt{-d}\sqrt{e}}$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(d + e*x^2),x]
```

```
[Out] ((a + b*ArcSin[c*x])^2*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] -
Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])^2*Log[1 + (S
qrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sq
rt[e]) + ((a + b*ArcSin[c*x])^2*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sq
rt[-d] + Sqrt[c^2*d + e])])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcSin[c*x])^2*L
og[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(2*Sq
rt[-d]*Sqrt[e]) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -((Sqrt[e]*E^(I*ArcSi
n[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt[e]) - (I*b*(a +
 b*ArcSin[c*x])*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt
```

```
[c^2*d + e])])/(Sqrt[-d]*Sqrt[e]) + (I*b*(a + b*ArcSin[c*x])*PolyLog[2, -((
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sq
rt[e]) - (I*b*(a + b*ArcSin[c*x])*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I
*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*Sqrt[e]) - (b^2*PolyLog[3, -((Sq
rt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt
[e]) + (b^2*PolyLog[3, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2
*d + e])])/(Sqrt[-d]*Sqrt[e]) - (b^2*PolyLog[3, -((Sqrt[e]*E^(I*ArcSin[c*x]
))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))])/(Sqrt[-d]*Sqrt[e]) + (b^2*PolyLog[3,
 (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])])/(Sqrt[-d]*S
qrt[e])
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4617

```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2, 2
] + b*E^(I*(c + d*x)))), x], x] + Dist[I, Int[(e + f*x)^m*(E^(I*(c + d*x))/
(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c,
d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
```

```
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4825

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{\sqrt{-d}(a+b\arcsin(cx))^2}{2d\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\sqrt{-d}(a+b\arcsin(cx))^2}{2d\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx \\
&= -\frac{\int \frac{(a+b\arcsin(cx))^2}{\sqrt{-d}-\sqrt{e}x}\,dx}{2\sqrt{-d}}-\frac{\int \frac{(a+b\arcsin(cx))^2}{\sqrt{-d}+\sqrt{e}x}\,dx}{2\sqrt{-d}} \\
&= -\frac{\text{Subst}\left(\int \frac{(a+bx)^2\cos(x)}{c\sqrt{-d}-\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}}-\frac{\text{Subst}\left(\int \frac{(a+bx)^2\cos(x)}{c\sqrt{-d}+\sqrt{e}\sin(x)}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}} \\
&= -\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{ic\sqrt{-d}-\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}} \\
&\quad -\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{ic\sqrt{-d}+\sqrt{c^2d+e}-\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}} \\
&\quad -\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{ic\sqrt{-d}-\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}} \\
&\quad -\frac{i\text{Subst}\left(\int \frac{e^{ix}(a+bx)^2}{ic\sqrt{-d}+\sqrt{c^2d+e}+\sqrt{e}e^{ix}}\,dx,x,\arcsin(cx)\right)}{2\sqrt{-d}}
\end{aligned}$$

$$= \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}$$
$$-\frac{(a+b\arcsin(cx))^2\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}$$
$$+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}$$
$$-\frac{(a+b\arcsin(cx))^2\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}$$
$$-\frac{b\text{Subst}\left(\int(a+bx)\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{-d}\sqrt{e}}$$
$$+\frac{b\text{Subst}\left(\int(a+bx)\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{-d}\sqrt{e}}$$
$$-\frac{b\text{Subst}\left(\int(a+bx)\log\left(1-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{-d}\sqrt{e}}$$
$$+\frac{b\text{Subst}\left(\int(a+bx)\log\left(1+\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{-d}\sqrt{e}}$$

$$= \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}$$
$$-\frac{(a+b\arcsin(cx))^2\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}$$
$$+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}$$
$$-\frac{(a+b\arcsin(cx))^2\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}}$$
$$+\frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}}$$
$$-\frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}}$$
$$+\frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}}$$
$$-\frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}}$$
$$-\frac{(ib^2)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{-d}\sqrt{e}}$$
$$+\frac{(ib^2)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{-d}\sqrt{e}}$$
$$-\frac{(ib^2)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{-d}\sqrt{e}}$$
$$+\frac{(ib^2)\operatorname{Subst}\left(\int\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{ix}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)\,dx,x,\arcsin(cx)\right)}{\sqrt{-d}\sqrt{e}}$$

$$= \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{(a+b\arcsin(cx))^2\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{(a+b\arcsin(cx))^2\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} + \frac{b^2\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}\left(2,\frac{\sqrt{e}x}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{-d}\sqrt{e}} - \frac{b^2\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}\left(2,\frac{\sqrt{e}x}{-ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{-d}\sqrt{e}} - \frac{b^2\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{-d}\sqrt{e}} + \frac{b^2\operatorname{Subst}\left(\int\frac{\operatorname{PolyLog}\left(2,\frac{\sqrt{e}x}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{x}dx,x,e^{i\arcsin(cx)}\right)}{\sqrt{-d}\sqrt{e}}$$

$$= \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{(a+b\arcsin(cx))^2\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} - \frac{(a+b\arcsin(cx))^2\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{2\sqrt{-d}\sqrt{e}} + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} + \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} - \frac{ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} - \frac{b^2\operatorname{PolyLog}\left(3,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} + \frac{b^2\operatorname{PolyLog}\left(3,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} - \frac{b^2\operatorname{PolyLog}\left(3,-\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}} + \frac{b^2\operatorname{PolyLog}\left(3,\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}+\sqrt{c^2d+e}}\right)}{\sqrt{-d}\sqrt{e}}$$

Mathematica [A] (verified)

Time = 0.61 (sec) , antiderivative size = 1101, normalized size of antiderivative = 1.34

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex^2}\,dx = \frac{2a^2\sqrt{-d}\arctan\left(\frac{\sqrt{e}x}{\sqrt{d}}\right) - 2ab\sqrt{d}\arcsin(cx)\log\left(1+\frac{\sqrt{e}e^{i\arcsin(cx)}}{ic\sqrt{-d}-\sqrt{c^2d+e}}\right) - b^2\sqrt{d}\arcsin(cx)^2\log\left(1+\frac{\sqrt{e}e^{i\arcsin(c}}{ic\sqrt{-d}-\sqrt{c^2}}\right.}{}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2),x]
```

```
[Out] (2*a^2*Sqrt[-d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]] - 2*a*b*Sqrt[d]*ArcSin[c*x]*Log
[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] - b^2*Sq
rt[d]*ArcSin[c*x]^2*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqr
t[c^2*d + e])] + 2*a*b*Sqrt[d]*ArcSin[c*x]*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x
```

```
]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d + e])] + b^2*Sqrt[d]*ArcSin[c*x]^2*Log[1
+ (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d + e])] + 2*a*b*
Sqrt[d]*ArcSin[c*x]*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqr
t[c^2*d + e])] + b^2*Sqrt[d]*ArcSin[c*x]^2*Log[1 - (Sqrt[e]*E^(I*ArcSin[c*x
]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])] - 2*a*b*Sqrt[d]*ArcSin[c*x]*Log[1 + (
Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])] - b^2*Sqrt[d]*
ArcSin[c*x]^2*Log[1 + (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*
d + e])] - (2*I)*b*Sqrt[d]*(a + b*ArcSin[c*x])*PolyLog[2, (Sqrt[e]*E^(I*Arc
Sin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] + (2*I)*b*Sqrt[d]*(a + b*ArcSi
n[c*x])*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*
d + e])] + (2*I)*a*b*Sqrt[d]*PolyLog[2, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*
Sqrt[-d] + Sqrt[c^2*d + e]))] + (2*I)*b^2*Sqrt[d]*ArcSin[c*x]*PolyLog[2, -(
(Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d + e]))] - (2*I)*a*b*
Sqrt[d]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d +
 e])] - (2*I)*b^2*Sqrt[d]*ArcSin[c*x]*PolyLog[2, (Sqrt[e]*E^(I*ArcSin[c*x])
)/(I*c*Sqrt[-d] + Sqrt[c^2*d + e])] + 2*b^2*Sqrt[d]*PolyLog[3, (Sqrt[e]*E^(
I*ArcSin[c*x]))/(I*c*Sqrt[-d] - Sqrt[c^2*d + e])] - 2*b^2*Sqrt[d]*PolyLog[3
, (Sqrt[e]*E^(I*ArcSin[c*x]))/((-I)*c*Sqrt[-d] + Sqrt[c^2*d + e])] - 2*b^2*
Sqrt[d]*PolyLog[3, -((Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-d] + Sqrt[c^2*d
 + e]))] + 2*b^2*Sqrt[d]*PolyLog[3, (Sqrt[e]*E^(I*ArcSin[c*x]))/(I*c*Sqrt[-
d] + Sqrt[c^2*d + e])])/(2*Sqrt[-d^2]*Sqrt[e])
```

Maple [F]

$$\int \frac{(a + b \arcsin (cx))^2}{e\,x^2 + d}dx$$

[In] `int((a+b*arcsin(c*x))^2/(e*x^2+d),x)`

[Out] `int((a+b*arcsin(c*x))^2/(e*x^2+d),x)`

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex^2}\,dx = \int \frac{(b\arcsin (cx) + a)^2}{ex^2 + d}\,dx$$

[In] `integrate((a+b*arcsin(c*x))^2/(e*x^2+d),x, algorithm="fricas")`

[Out] `integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(e*x^2 + d), x)`

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex^2}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{d+ex^2}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(e*x**2+d),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(d + e*x**2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex^2}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{ex^2+d}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(e*x^2 + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex^2}\,dx = \int \frac{(a+b\operatorname{asin}(c\,x))^2}{e\,x^2+d}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(d + e*x^2),x)
```

```
[Out] int((a + b*asin(c*x))^2/(d + e*x^2), x)
```

3.664 $\int \sqrt{d+ex^2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))^2\,dx=\text{Int}\left(\sqrt{d+ex^2}(a+b\arcsin(cx))^2,x\right)$$

```
[Out] Unintegrable((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))^2\,dx=\int \sqrt{d+ex^2}(a+b\arcsin(cx))^2\,dx$$

```
[In] Int[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2,x]
[Out] Defer[Int][Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\text{integral}=\int \sqrt{d+ex^2}(a+b\arcsin(cx))^2\,dx$$

Mathematica [N/A]

Not integrable

Time = 20.95 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))^2\,dx=\int \sqrt{d+ex^2}(a+b\arcsin(cx))^2\,dx$$

```
[In] Integrate[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.95 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \sqrt{e\,x^{2}+d}\,\left(a+b\arcsin\left(c x\right)\right)^{2}dx$$

```
[In] int((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
[Out] int((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.55

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))^2\,dx=\int \sqrt{ex^2+d}(b\arcsin\left(cx\right)+a)^2\,dx$$

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(e*x^2 + d), x)
```

Sympy [N/A]

Not integrable

Time = 8.65 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))^2\,dx=\int \left(a+b\,\mathrm{asin}\left(cx\right)\right)^2\sqrt{d+ex^2}\,dx$$

```
[In] integrate((e*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
[Out] Integral((a + b*asin(c*x))**2*sqrt(d + e*x**2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [N/A]

Not integrable

Time = 0.60 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{ex^2+d}(b\arcsin(cx)+a)^2\,dx$$

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \sqrt{d+ex^2}(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{e\,x^2+d}\,dx$$

```
[In] int((a + b*asin(c*x))^2*(d + e*x^2)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))^2*(d + e*x^2)^(1/2), x)
```

3.665 $\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+ex^2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+ex^2}}\,dx = \text{Int}\left(\frac{(a+b\arcsin(cx))^2}{\sqrt{d+ex^2}},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+ex^2}}\,dx = \int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+ex^2}}\,dx$$

```
[In] Int[(a + b*ArcSin[c*x])^2/Sqrt[d + e*x^2],x]
```

```
[Out] Defer[Int][(a + b*ArcSin[c*x])^2/Sqrt[d + e*x^2], x]
```

Rubi steps

$$\text{integral} = \int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+ex^2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 9.33 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+ex^2}}\,dx=\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+ex^2}}\,dx$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/Sqrt[d + e*x^2],x]
[Out] Integrate[(a + b*ArcSin[c*x])^2/Sqrt[d + e*x^2], x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.19 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{e\,x^2+d}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x)
[Out] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.55

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+ex^2}}\,dx=\int \frac{(b\arcsin(cx)+a)^2}{\sqrt{ex^2+d}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x, algorithm="fricas")
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/sqrt(e*x^2 + d), x)
```

Sympy [N/A]

Not integrable

Time = 3.34 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+ex^2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(cx))^2}{\sqrt{d+ex^2}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(e*x**2+d)**(1/2),x)
[Out] Integral((a + b*asin(c*x))**2/sqrt(d + e*x**2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+ex^2}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+ex^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{ex^2+d}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/sqrt(e*x^2 + d), x)
```

Mupad [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+ex^2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{e\,x^2+d}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(d + e*x^2)^(1/2),x)
```

```
[Out] int((a + b*asin(c*x))^2/(d + e*x^2)^(1/2), x)
```

3.666 $\int \frac{(a+b \arcsin(cx))^2}{(d+ex^2)^{3/2}} dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{(a+b \arcsin(cx))^2}{(d+ex^2)^{3/2}} dx = \operatorname{Int}\left(\frac{(a+b \arcsin(cx))^2}{(d+ex^2)^{3/2}}, x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(a+b \arcsin(cx))^2}{(d+ex^2)^{3/2}} dx = \int \frac{(a+b \arcsin(cx))^2}{(d+ex^2)^{3/2}} dx$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(3/2),x]
```

```
[Out] Defer[Int][(a + b*ArcSin[c*x])^2/(d + e*x^2)^(3/2), x]
```

Rubi steps

$$\text{integral} = \int \frac{(a+b \arcsin(cx))^2}{(d+ex^2)^{3/2}} dx$$

Mathematica [N/A]

Not integrable

Time = 3.62 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{3/2}}\,dx=\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{3/2}}\,dx$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(3/2),x]
[Out] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(3/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 2.20 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{\left(a+b\arcsin\left(cx\right)\right)^{2}}{\left(e\,x^{2}+d\right)^{\frac{3}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x)
[Out] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 54, normalized size of antiderivative = 2.45

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{3/2}}\,dx=\int \frac{\left(b\arcsin\left(cx\right)+a\right)^{2}}{\left(ex^{2}+d\right)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x, algorithm="fricas")
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(e*x^2 + d)/(e^2
*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [N/A]

Not integrable

Time = 5.48 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{3/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}\,(cx))^2}{(d+ex^2)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**2/(d + e*x**2)**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{3/2}}\,dx=\text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e+c^2*d>0)', see `assume?` for more
 detail
```

Giac [N/A]

Not integrable

Time = 0.49 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{3/2}}\,dx=\int \frac{(b\arcsin\,(cx)+a)^2}{(ex^2+d)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^2/(e*x^2 + d)^(3/2), x)
```

Mupad [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{3/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(e\,x^2+d)^{3/2}}\,dx$$

```
[In] int((a + b*asin(c*x))^2/(d + e*x^2)^(3/2),x)
[Out] int((a + b*asin(c*x))^2/(d + e*x^2)^(3/2), x)
```

3.667 $\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{5/2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{5/2}}\,dx = \text{Int}\left(\frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{5/2}},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{5/2}}\,dx = \int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{5/2}}\,dx$$

```
[In] Int[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(5/2),x]
```

```
[Out] Defer[Int][(a + b*ArcSin[c*x])^2/(d + e*x^2)^(5/2), x]
```

Rubi steps

$$\text{integral} = \int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{5/2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 8.99 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{5/2}}\,dx=\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{5/2}}\,dx$$

```
[In] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(5/2),x]
[Out] Integrate[(a + b*ArcSin[c*x])^2/(d + e*x^2)^(5/2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 2.14 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{\left(a+b\arcsin\left(cx\right)\right)^{2}}{\left(e\,x^{2}+d\right)^{\frac{5}{2}}}dx$$

```
[In] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x)
[Out] int((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 65, normalized size of antiderivative = 2.95

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{5/2}}\,dx=\int \frac{\left(b\arcsin\left(cx\right)+a\right)^{2}}{\left(ex^{2}+d\right)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x, algorithm="fricas")
[Out] integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(e*x^2 + d)/(e^3
*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^3), x)
```

Sympy [N/A]

Not integrable

Time = 63.42 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2}{(d+ex^2)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**2/(e*x**2+d)**(5/2),x)
[Out] Integral((a + b*asin(c*x))**2/(d + e*x**2)**(5/2), x)
```

Maxima [N/A]

Not integrable

Time = 0.50 (sec) , antiderivative size = 130, normalized size of antiderivative = 5.91

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(ex^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x, algorithm="maxima")
[Out] 1/3*a^2*(2*x/(sqrt(e*x^2 + d)*d^2) + x/((e*x^2 + d)^(3/2)*d)) + integrate((
b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*a*b*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)))*sqrt(e*x^2 + d)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*
x^2 + d^3), x)
```

Giac [N/A]

Not integrable

Time = 0.57 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex^2)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(ex^2+d)^{\frac{5}{2}}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^2/(e*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^2/(e*x^2 + d)^(5/2), x)
```

Mupad [N/A]

Not integrable

Time = 0.30 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{(a + b \arcsin(cx))^2}{(d + ex^2)^{5/2}} \, dx = \int \frac{(a + b \operatorname{asin}(c\,x))^2}{(e\,x^2 + d)^{5/2}} \, dx$$

```
[In] int((a + b*asin(c*x))^2/(d + e*x^2)^(5/2),x)
[Out] int((a + b*asin(c*x))^2/(d + e*x^2)^(5/2), x)
```

3.668 $\int \frac{(d+ex^2)^2}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 387

$$\begin{aligned}\int \frac{(d+ex^2)^2}{a+b\arcsin(cx)}\,dx =& \frac{d^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}\\ &+\frac{de\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{2bc^3}\\ &+\frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^5}\\ &-\frac{de\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{2bc^3}\\ &-\frac{3e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^5}\\ &+\frac{e^2\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^5}\\ &+\frac{d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}+\frac{de\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{2bc^3}\\ &+\frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^5}-\frac{de\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{2bc^3}\\ &-\frac{3e^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^5}+\frac{e^2\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^5}\end{aligned}$$

```
[Out] d^2*Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b/c+1/2*d*e*Ci((a+b*arcsin(c*x))/b)*co
s(a/b)/b/c^3+1/8*e^2*Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b/c^5-1/2*d*e*Ci(3*(a
```

```
+b*arcsin(c*x))/b)*cos(3*a/b)/b/c^3-3/16*e^2*Ci(3*(a+b*arcsin(c*x))/b)*cos(
3*a/b)/b/c^5+1/16*e^2*Ci(5*(a+b*arcsin(c*x))/b)*cos(5*a/b)/b/c^5+d^2*Si((a+
b*arcsin(c*x))/b)*sin(a/b)/b/c+1/2*d*e*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b/c
^3+1/8*e^2*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b/c^5-1/2*d*e*Si(3*(a+b*arcsin(
c*x))/b)*sin(3*a/b)/b/c^3-3/16*e^2*Si(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b/c
^5+1/16*e^2*Si(5*(a+b*arcsin(c*x))/b)*sin(5*a/b)/b/c^5
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 387, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {4757, 4719, 3384, 3380, 3383, 4731, 4491}

$$\int \frac{(d+ex^2)^2}{a+b\arcsin(cx)}\,dx = \frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^5} - \frac{3e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^5} + \frac{e^2\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^5} + \frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^5} - \frac{3e^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^5} + \frac{e^2\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^5} + \frac{de\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{2bc^3} - \frac{de\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{2bc^3} + \frac{de\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{2bc^3} - \frac{de\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{2bc^3} + \frac{d^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc} + \frac{d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}$$

```
[In] Int[(d + e*x^2)^2/(a + b*ArcSin[c*x]),x]
```

```
[Out] (d^2*Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b])/(b*c) + (d*e*Cos[a/b]*Cos
Integral[(a + b*ArcSin[c*x])/b])/(2*b*c^3) + (e^2*Cos[a/b]*CosIntegral[(a +
 b*ArcSin[c*x])/b])/(8*b*c^5) - (d*e*Cos[(3*a)/b]*CosIntegral[(3*(a + b*Arc
Sin[c*x]))/b])/(2*b*c^3) - (3*e^2*Cos[(3*a)/b]*CosIntegral[(3*(a + b*ArcSin
[c*x]))/b])/(16*b*c^5) + (e^2*Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSin[c*x
]))/b])/(16*b*c^5) + (d^2*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b*c
```

```
) + (d*e*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(2*b*c^3) + (e^2*Sin[
a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(8*b*c^5) - (d*e*Sin[(3*a)/b]*SinI
ntegral[(3*(a + b*ArcSin[c*x]))/b])/(2*b*c^3) - (3*e^2*Sin[(3*a)/b]*SinInte
gral[(3*(a + b*ArcSin[c*x]))/b])/(16*b*c^5) + (e^2*Sin[(5*a)/b]*SinIntegral
[(5*(a + b*ArcSin[c*x]))/b])/(16*b*c^5)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
```

```
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{d^2}{a+b\arcsin(cx)}+\frac{2dex^2}{a+b\arcsin(cx)}+\frac{e^2x^4}{a+b\arcsin(cx)}\right)dx\\
&= d^2\int \frac{1}{a+b\arcsin(cx)}\,dx+(2de)\int \frac{x^2}{a+b\arcsin(cx)}\,dx+e^2\int \frac{x^4}{a+b\arcsin(cx)}\,dx\\
&= \frac{d^2\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{bc}\\
&\quad+\frac{(2de)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{bc^3}\\
&\quad+\frac{e^2\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{bc^5}\\
&= \frac{(2de)\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)dx,x,a+b\arcsin(cx)\right)}{bc^3}\\
&\quad+\frac{e^2\text{Subst}\left(\int \left(\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x}-\frac{3\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right)dx,x,a+b\arcsin(cx)\right)}{bc^5}\\
&\quad+\frac{\left(d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{bc}\\
&\quad+\frac{\left(d^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{bc}\\
&= \frac{d^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}+\frac{d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}\\
&\quad-\frac{(de)\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2bc^3}\\
&\quad+\frac{(de)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2bc^3}\\
&\quad+\frac{e^2\text{Subst}\left(\int \frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16bc^5}\\
&\quad+\frac{e^2\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8bc^5}\\
&\quad-\frac{(3e^2)\,\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16bc^5}
\end{aligned}$$

$$= \frac{d^2 \cos\left(\frac{a}{b}\right) \text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc} + \frac{d^2 \sin\left(\frac{a}{b}\right) \text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}$$
$$+ \frac{\left(de\cos\left(\frac{a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc^3}$$
$$+ \frac{\left(e^2\cos\left(\frac{a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8bc^5}$$
$$- \frac{\left(de\cos\left(\frac{3a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc^3}$$
$$- \frac{\left(3e^2\cos\left(\frac{3a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^5}$$
$$+ \frac{\left(e^2\cos\left(\frac{5a}{b}\right)\right) \text{Subst}\left(\int \frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^5}$$
$$+ \frac{\left(de\sin\left(\frac{a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc^3}$$
$$+ \frac{\left(e^2\sin\left(\frac{a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{8bc^5}$$
$$- \frac{\left(de\sin\left(\frac{3a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{2bc^3}$$
$$- \frac{\left(3e^2\sin\left(\frac{3a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^5}$$
$$+ \frac{\left(e^2\sin\left(\frac{5a}{b}\right)\right) \text{Subst}\left(\int \frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{16bc^5}$$

$$= \frac{d^2 \cos\left(\frac{a}{b}\right) \text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc} + \frac{de \cos\left(\frac{a}{b}\right) \text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{2bc^3} + \frac{e^2 \cos\left(\frac{a}{b}\right) \text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^5} - \frac{de \cos\left(\frac{3a}{b}\right) \text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{2bc^3} - \frac{3e^2 \cos\left(\frac{3a}{b}\right) \text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^5} + \frac{e^2 \cos\left(\frac{5a}{b}\right) \text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^5} + \frac{d^2 \sin\left(\frac{a}{b}\right) \text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc} + \frac{de \sin\left(\frac{a}{b}\right) \text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{2bc^3} + \frac{e^2 \sin\left(\frac{a}{b}\right) \text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8bc^5} - \frac{de \sin\left(\frac{3a}{b}\right) \text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{2bc^3} - \frac{3e^2 \sin\left(\frac{3a}{b}\right) \text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16bc^5} + \frac{e^2 \sin\left(\frac{5a}{b}\right) \text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16bc^5}$$

Mathematica [A] (verified)

Time = 0.52 (sec) , antiderivative size = 253, normalized size of antiderivative = 0.65

$$\int \frac{(d+ex^2)^2}{a+b\arcsin(cx)}\,dx = \frac{2(8c^4d^2+4c^2de+e^2)\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right) - e(8c^2d+3e)\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{ar}\right.\right.}{}$$

```
[In] Integrate[(d + e*x^2)^2/(a + b*ArcSin[c*x]),x]
```

```
[Out] (2*(8*c^4*d^2 + 4*c^2*d*e + e^2)*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] -
e*(8*c^2*d + 3*e)*Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + e^2*Cos
[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c*x])] + 16*c^4*d^2*Sin[a/b]*SinInteg
ral[a/b + ArcSin[c*x]] + 8*c^2*d*e*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]]
+ 2*e^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] - 8*c^2*d*e*Sin[(3*a)/b]*Si
nIntegral[3*(a/b + ArcSin[c*x])] - 3*e^2*Sin[(3*a)/b]*SinIntegral[3*(a/b +
ArcSin[c*x])] + e^2*Sin[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c*x])])/(16*b*
c^5)
```

Maple [A] (verified)

Time = 0.25 (sec) , antiderivative size = 310, normalized size of antiderivative = 0.80

method	result
derivativedivides	$\frac{16\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)c^4d^2+16\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)c^4d^2+8\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)c^2de+8\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\arcsin\right.}{}$
default	$\frac{16\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)c^4d^2+16\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)c^4d^2+8\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)c^2de+8\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\arcsin\right.}{}$

```
[In] int((e*x^2+d)^2/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] 1/16/c^5*(16*sin(a/b)*Si(arcsin(c*x)+a/b)*c^4*d^2+16*cos(a/b)*Ci(arcsin(c*x
)+a/b)*c^4*d^2+8*sin(a/b)*Si(arcsin(c*x)+a/b)*c^2*d*e+8*cos(a/b)*Ci(arcsin(
c*x)+a/b)*c^2*d*e-8*sin(3*a/b)*Si(3*arcsin(c*x)+3*a/b)*c^2*d*e-8*cos(3*a/b)
*Ci(3*arcsin(c*x)+3*a/b)*c^2*d*e+2*sin(a/b)*Si(arcsin(c*x)+a/b)*e^2+2*cos(a
/b)*Ci(arcsin(c*x)+a/b)*e^2-3*sin(3*a/b)*Si(3*arcsin(c*x)+3*a/b)*e^2-3*cos(
3*a/b)*Ci(3*arcsin(c*x)+3*a/b)*e^2+sin(5*a/b)*Si(5*arcsin(c*x)+5*a/b)*e^2+c
os(5*a/b)*Ci(5*arcsin(c*x)+5*a/b)*e^2)/b
```

Fricas [F]

$$\int \frac{(d+ex^2)^2}{a+b\arcsin(cx)}\,dx = \int \frac{(ex^2+d)^2}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((e^2*x^4 + 2*d*e*x^2 + d^2)/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{(d+ex^2)^2}{a+b\arcsin(cx)}\,dx = \int \frac{(d+ex^2)^2}{a+b\,\mathrm{asin}(cx)}\,dx$$

```
[In] integrate((e*x**2+d)**2/(a+b*asin(c*x)),x)
[Out] Integral((d + e*x**2)**2/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{(d+ex^2)^2}{a+b\arcsin(cx)}\,dx = \int \frac{(ex^2+d)^2}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((e*x^2 + d)^2/(b*arcsin(c*x) + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.32 (sec) , antiderivative size = 633, normalized size of antiderivative = 1.64

$$\int \frac{(d+ex^2)^2}{a+b\arcsin(cx)}\,dx = \frac{e^2\cos\left(\frac{a}{b}\right)^5\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{bc^5} - \frac{2de\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^3} + \frac{d^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{e^2\cos\left(\frac{a}{b}\right)^4\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{bc^5} - \frac{2de\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^3} + \frac{d^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} - \frac{5e^2\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{4bc^5} + \frac{3de\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{2bc^3} - \frac{3e^2\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^5} + \frac{de\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{2bc^3} - \frac{3e^2\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{4bc^5} + \frac{de\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{2bc^3} - \frac{3e^2\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^5} + \frac{de\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{2bc^3} + \frac{5e^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{16bc^5} + \frac{9e^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{16bc^5} + \frac{e^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{8bc^5} + \frac{e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin(cx)\right)}{16bc^5} + \frac{3e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{16bc^5} + \frac{e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{8bc^5}$$

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] e^2*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(c*x))/(b*c^5) - 2*d*e*cos(a/b)
^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + d^2*cos(a/b)*cos_integral(
a/b + arcsin(c*x))/(b*c) + e^2*cos(a/b)^4*sin(a/b)*sin_integral(5*a/b + 5*a
rcsin(c*x))/(b*c^5) - 2*d*e*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcs
in(c*x))/(b*c^3) + d^2*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c) - 5/4
*e^2*cos(a/b)^3*cos_integral(5*a/b + 5*arcsin(c*x))/(b*c^5) + 3/2*d*e*cos(a
/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) - 3/4*e^2*cos(a/b)^3*cos_in
tegral(3*a/b + 3*arcsin(c*x))/(b*c^5) + 1/2*d*e*cos(a/b)*cos_integral(a/b +
 arcsin(c*x))/(b*c^3) - 3/4*e^2*cos(a/b)^2*sin(a/b)*sin_integral(5*a/b + 5*
arcsin(c*x))/(b*c^5) + 1/2*d*e*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))
/(b*c^3) - 3/4*e^2*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/
(b*c^5) + 1/2*d*e*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^3) + 5/16*e
^2*cos(a/b)*cos_integral(5*a/b + 5*arcsin(c*x))/(b*c^5) + 9/16*e^2*cos(a/b)
*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^5) + 1/8*e^2*cos(a/b)*cos_integra
l(a/b + arcsin(c*x))/(b*c^5) + 1/16*e^2*sin(a/b)*sin_integral(5*a/b + 5*arc
sin(c*x))/(b*c^5) + 3/16*e^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(
b*c^5) + 1/8*e^2*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^5)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex^2)^2}{a+b\arcsin(cx)}\,dx=\int \frac{{\left(e\,x^2+d\right)}^2}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((d + e*x^2)^2/(a + b*asin(c*x)),x)
```

```
[Out] int((d + e*x^2)^2/(a + b*asin(c*x)), x)
```

3.669 $\int \frac{d+ex^2}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 179

$$\int \frac{d+ex^2}{a+b\arcsin(cx)}\,dx = \frac{d\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc} + \frac{e\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4bc^3} - \frac{e\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4bc^3} + \frac{d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc} + \frac{e\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4bc^3} - \frac{e\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4bc^3}$$

```
[Out] d*Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b/c+1/4*e*Ci((a+b*arcsin(c*x))/b)*cos(a/
b)/b/c^3-1/4*e*Ci(3*(a+b*arcsin(c*x))/b)*cos(3*a/b)/b/c^3+d*Si((a+b*arcsin(
c*x))/b)*sin(a/b)/b/c+1/4*e*Si((a+b*arcsin(c*x))/b)*sin(a/b)/b/c^3-1/4*e*Si
(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b/c^3
```

Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used = {4757, 4719, 3384, 3380, 3383, 4731, 4491}

$$\int \frac{d+ex^2}{a+b\arcsin(cx)}\,dx = \frac{e\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4bc^3} - \frac{e\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4bc^3} + \frac{e\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4bc^3} - \frac{e\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4bc^3} + \frac{d\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc} + \frac{d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}$$

```
[In] Int[(d + e*x^2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] (d*Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b])/(b*c) + (e*Cos[a/b]*CosInte
gral[(a + b*ArcSin[c*x])/b])/(4*b*c^3) - (e*Cos[(3*a)/b]*CosIntegral[(3*(a
+ b*ArcSin[c*x]))/b])/(4*b*c^3) + (d*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x
])/b])/(b*c) + (e*Sin[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(4*b*c^3) -
(e*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b])/(4*b*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
```

```
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(\frac{d}{a+b\arcsin(cx)}+\frac{ex^2}{a+b\arcsin(cx)}\right)dx\\
&= d\int \frac{1}{a+b\arcsin(cx)}\,dx+e\int \frac{x^2}{a+b\arcsin(cx)}\,dx\\
&= \frac{d\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{bc}\\
&\quad+\frac{e\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{bc^3}\\
&= \frac{e\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)dx,x,a+b\arcsin(cx)\right)}{bc^3}\\
&\quad+\frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{bc}\\
&\quad+\frac{\left(d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{bc}
\end{aligned}
$$

$$= \frac{d\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}+\frac{d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc} - \frac{e\text{Subst}\left(\int\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{4bc^3} + \frac{e\text{Subst}\left(\int\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{4bc^3}$$

$$= \frac{d\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}+\frac{d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc} + \frac{\left(e\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{4bc^3} - \frac{\left(e\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{4bc^3} + \frac{\left(e\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{4bc^3} - \frac{\left(e\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}dx,x,a+b\arcsin(cx)\right)}{4bc^3}$$

$$= \frac{d\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}+\frac{e\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4bc^3} - \frac{e\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4bc^3}+\frac{d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc} + \frac{e\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4bc^3}-\frac{e\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4bc^3}$$

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.70

$$\int\frac{d+ex^2}{a+b\arcsin(cx)}\,dx = \frac{(4c^2d+e)\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)-e\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)+4c^2d\sin\left(\frac{a}{b}\right)\ldots}{4bc^3}$$

```
[In] Integrate[(d + e*x^2)/(a + b*ArcSin[c*x]),x]
```

```
[Out] ((4*c^2*d + e)*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] - e*Cos[(3*a)/b]*Cos
Integral[3*(a/b + ArcSin[c*x])] + 4*c^2*d*Sin[a/b]*SinIntegral[a/b + ArcSin
[c*x]] + e*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] - e*Sin[(3*a)/b]*SinInte
gral[3*(a/b + ArcSin[c*x])])/(4*b*c^3)
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.83

method	result
derivativedivides	$\frac{\frac{d\left(\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)\right)}{b}+\frac{e\left(\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)\right)}{4c^2b}-\frac{e(\mathrm{Si}(3\arcsin}{c}$
default	$\frac{\frac{d\left(\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)\right)}{b}+\frac{e\left(\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)\right)}{4c^2b}-\frac{e(\mathrm{Si}(3\arcsin}{c}$

```
[In] int((e*x^2+d)/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] 1/c*(d*(Si(arcsin(c*x)+a/b)*sin(a/b)+Ci(arcsin(c*x)+a/b)*cos(a/b))/b+1/4*e/
c^2*(Si(arcsin(c*x)+a/b)*sin(a/b)+Ci(arcsin(c*x)+a/b)*cos(a/b))/b-1/4*e/c^2
*(Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b)+Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b))/b)
```

Fricas [F]

$$\int \frac{d+ex^2}{a+b\arcsin(cx)}\,dx=\int \frac{ex^2+d}{b\arcsin\left(cx\right)+a}\,dx$$

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral((e*x^2 + d)/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{d+ex^2}{a+b\arcsin(cx)}\,dx=\int \frac{d+ex^2}{a+b\,\mathrm{asin}\left(cx\right)}\,dx$$

```
[In] integrate((e*x**2+d)/(a+b*asin(c*x)),x)
[Out] Integral((d + e*x**2)/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{d+ex^2}{a+b\arcsin(cx)}\,dx=\int \frac{ex^2+d}{b\arcsin\left(cx\right)+a}\,dx$$

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate((e*x^2 + d)/(b*arcsin(c*x) + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.31 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.28

$$\int \frac{d+ex^2}{a+b\arcsin(cx)}\,dx = -\frac{e\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^3}+\frac{d\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} - \frac{e\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^3} + \frac{d\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc}+\frac{3e\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} + \frac{e\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3}+\frac{e\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} + \frac{e\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3}$$

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

```
[Out] -e*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + d*cos(a/b)*cos_
integral(a/b + arcsin(c*x))/(b*c) - e*cos(a/b)^2*sin(a/b)*sin_integral(3*a/
b + 3*arcsin(c*x))/(b*c^3) + d*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*
c) + 3/4*e*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + 1/4*e*cos
(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c^3) + 1/4*e*sin(a/b)*sin_integral
(3*a/b + 3*arcsin(c*x))/(b*c^3) + 1/4*e*sin(a/b)*sin_integral(a/b + arcsin(
c*x))/(b*c^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{d+ex^2}{a+b\arcsin(cx)}\,dx = \int \frac{e\,x^2+d}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((d + e*x^2)/(a + b*asin(c*x)),x)
```

```
[Out] int((d + e*x^2)/(a + b*asin(c*x)), x)
```

3.670 $\int \frac{1}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 53

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}$$

```
[Out] Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b/c+Si((a+b*arcsin(c*x))/b)*sin(a/b)/b/c
```

Rubi [A] (verified)

Time = 0.04 (sec) , antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4719, 3384, 3380, 3383}

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}$$

```
[In] Int[(a + b*ArcSin[c*x])^(-1),x]
```

```
[Out] (Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b])/(b*c) + (Sin[a/b]*SinIntegral
[(a + b*ArcSin[c*x])/b])/(b*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
```

```
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc}\\
&= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc}\\
&\quad+\frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{bc}\\
&= \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}
\end{aligned}$$

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.83

$$\int \frac{1}{a+b\arcsin(cx)}\,dx = \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^(-1),x]
[Out] (Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + Sin[a/b]*SinIntegral[a/b + ArcSi
n[c*x]])/(b*c)
```

Maple [A] (verified)

Time = 0.06 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.91

method	result	size
derivativedivides	$\frac{\frac{\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b}+\frac{\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b}}{c}$	48
default	$\frac{\frac{\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b}+\frac{\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b}}{c}$	48

```
[In] int(1/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
[Out] 1/c*(Si(arcsin(c*x)+a/b)*sin(a/b)/b+Ci(arcsin(c*x)+a/b)*cos(a/b)/b)
```

Fricas [F]

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\int \frac{1}{b\arcsin\left(cx\right)+a}\,dx$$

```
[In] integrate(1/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(1/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\int \frac{1}{a+b\operatorname{asin}\left(cx\right)}\,dx$$

```
[In] integrate(1/(a+b*asin(c*x)),x)
[Out] Integral(1/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\int \frac{1}{b\arcsin\left(cx\right)+a}\,dx$$

```
[In] integrate(1/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/(b*arcsin(c*x) + a), x)
```

Giac [A] (verification not implemented)

none

Time = 0.29 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.92

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{bc}$$

```
[In] integrate(1/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c) + sin(a/b)*sin_integral(a/b
+ arcsin(c*x))/(b*c)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\int \frac{1}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int(1/(a + b*asin(c*x)),x)
[Out] int(1/(a + b*asin(c*x)), x)
```

3.671 $\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 20

$$\int \frac{1}{(d+ex^2)\,(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{1}{(d+ex^2)\,(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.02 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+ex^2)\,(a+b\arcsin(cx))}\,dx = \int \frac{1}{(d+ex^2)\,(a+b\arcsin(cx))}\,dx$$

```
[In] Int[1/((d + e*x^2)*(a + b*ArcSin[c*x])),x]
[Out] Defer[Int][1/((d + e*x^2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex^2)\,(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.75 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(d+ex^2)\,(a+b\arcsin(cx))}\,dx=\int \frac{1}{(d+ex^2)\,(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.28 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00

$$\int \frac{1}{(e\,x^2+d)\,(a+b\arcsin\,(cx))}dx$$

```
[In] int(1/(e*x^2+d)/(a+b*arcsin(c*x)),x)
[Out] int(1/(e*x^2+d)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.45

$$\int \frac{1}{(d+ex^2)\,(a+b\arcsin(cx))}\,dx=\int \frac{1}{(ex^2+d)(b\arcsin\,(cx)+a)}\,dx$$

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(1/(a*e*x^2 + a*d + (b*e*x^2 + b*d)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 3.29 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.85

$$\int \frac{1}{(d+ex^2)\,(a+b\arcsin(cx))}\,dx=\int \frac{1}{(a+b\,\mathrm{asin}\,(cx))\,(d+ex^2)}\,dx$$

```
[In] integrate(1/(e*x**2+d)/(a+b*asin(c*x)),x)
[Out] Integral(1/((a + b*asin(c*x))*(d + e*x**2)), x)
```

Maxima [N/A]

Not integrable

Time = 0.35 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex^2+d)(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((e*x^2 + d)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.45 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex^2+d)(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}(c\,x))\,(e\,x^2+d)}\,dx$$

```
[In] int(1/((a + b*asin(c*x))*(d + e*x^2)),x)
[Out] int(1/((a + b*asin(c*x))*(d + e*x^2)), x)
```

3.672 $\int \frac{1}{(d+ex^2)^2(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 20

$$\int \frac{1}{(d+ex^2)^2\,(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{1}{(d+ex^2)^2\,(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.02 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+ex^2)^2\,(a+b\arcsin(cx))}\,dx = \int \frac{1}{(d+ex^2)^2\,(a+b\arcsin(cx))}\,dx$$

```
[In] Int[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^2*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex^2)^2\,(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 3.16 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))} dx = \int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))} dx$$

```
[In] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 3.69 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00

$$\int \frac{1}{(e\,x^2+d)^2 (a+b\arcsin(cx))}dx$$

```
[In] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x)
[Out] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 53, normalized size of antiderivative = 2.65

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))} dx = \int \frac{1}{(ex^2+d)^2(b\arcsin(cx)+a)} dx$$

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(1/(a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*
d^2)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 101.62 (sec) , antiderivative size = 19, normalized size of antiderivative = 0.95

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))} dx = \int \frac{1}{(a+b\,\text{asin}\,(cx))\,(d+ex^2)^2} dx$$

```
[In] integrate(1/(e*x**2+d)**2/(a+b*asin(c*x)),x)
[Out] Integral(1/((a + b*asin(c*x))*(d + e*x**2)**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))} dx = \int \frac{1}{(ex^2+d)^2(b\arcsin(cx)+a)} dx$$

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((e*x^2 + d)^2*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 4.60 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))} dx = \int \frac{1}{(ex^2+d)^2(b\arcsin(cx)+a)} dx$$

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)^2*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c\,x))\,\left(e\,x^2+d\right)^2}\,dx$$

```
[In] int(1/((a + b*asin(c*x))*(d + e*x^2)^2),x)
[Out] int(1/((a + b*asin(c*x))*(d + e*x^2)^2), x)
```

3.673 $\int \frac{\sqrt{d+ex^2}}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{\sqrt{d+ex^2}}{a+b\arcsin(cx)}\,dx = \text{Int}\left(\frac{\sqrt{d+ex^2}}{a+b\arcsin(cx)},x\right)$$

```
[Out] Unintegrable((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{d+ex^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{d+ex^2}}{a+b\arcsin(cx)}\,dx$$

```
[In] Int[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x]),x]
[Out] Defer[Int][Sqrt[d + e*x^2]/(a + b*ArcSin[c*x]), x]
```

Rubi steps

$$\text{integral} = \int \frac{\sqrt{d+ex^2}}{a+b\arcsin(cx)}\,dx$$

Mathematica [N/A]

Not integrable

Time = 1.12 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{\sqrt{d+ex^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{d+ex^2}}{a+b\arcsin(cx)}\,dx$$

```
[In] Integrate[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x]),x]
[Out] Integrate[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.00 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{\sqrt{e\,x^2+d}}{a+b\arcsin\left(cx\right)}dx$$

```
[In] int((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
[Out] int((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{d+ex^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{ex^2+d}}{b\arcsin\left(cx\right)+a}\,dx$$

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)/(b*arcsin(c*x) + a), x)
```

Sympy [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 19, normalized size of antiderivative = 0.86

$$\int \frac{\sqrt{d+ex^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{d+ex^2}}{a+b\operatorname{asin}\left(cx\right)}\,dx$$

```
[In] integrate((e*x**2+d)**(1/2)/(a+b*asin(c*x)),x)
[Out] Integral(sqrt(d + e*x**2)/(a + b*asin(c*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{d+ex^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{ex^2+d}}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(e*x^2 + d)/(b*arcsin(c*x) + a), x)
```

Giac [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{d+ex^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{ex^2+d}}{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(sqrt(e*x^2 + d)/(b*arcsin(c*x) + a), x)
```

Mupad [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{d+ex^2}}{a+b\arcsin(cx)}\,dx = \int \frac{\sqrt{e\,x^2+d}}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((d + e*x^2)^(1/2)/(a + b*asin(c*x)),x)
[Out] int((d + e*x^2)^(1/2)/(a + b*asin(c*x)), x)
```

3.674 $\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))} dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))} dx = \text{Int}\left(\frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))}, x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))} dx = \int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))} dx$$

```
[In] Int[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))} dx$$

Mathematica [N/A]

Not integrable

Time = 0.91 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.03 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{\sqrt{e\,x^2+d}\,\left(a+b\arcsin\left(cx\right)\right)}dx$$

```
[In] int(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
[Out] int(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.77

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{\sqrt{ex^2+d}(b\arcsin\left(cx\right)+a)}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)/(a*e*x^2 + a*d + (b*e*x^2 + b*d)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 0.64 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{\left(a+b\operatorname{asin}\left(cx\right)\right)\sqrt{d+ex^2}}\,dx$$

```
[In] integrate(1/(e*x**2+d)**(1/2)/(a+b*asin(c*x)),x)
[Out] Integral(1/((a + b*asin(c*x))*sqrt(d + e*x**2)), x)
```

Maxima [N/A]

Not integrable

Time = 0.35 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{\sqrt{ex^2+d}(b\arcsin{(cx)}+a)}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{\sqrt{ex^2+d}(b\arcsin{(cx)}+a)}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c\,x))\,\sqrt{e\,x^2+d}}\,dx$$

```
[In] int(1/((a + b*asin(c*x))*(d + e*x^2)^(1/2)),x)
[Out] int(1/((a + b*asin(c*x))*(d + e*x^2)^(1/2)), x)
```

3.675 $\int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))} dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))} dx = \operatorname{Int}\left(\frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))}, x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))} dx = \int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))} dx$$

```
[In] Int[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))} dx$$

Mathematica [N/A]

Not integrable

Time = 1.59 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.13 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{(e\,x^2+d)^{\frac{3}{2}}\,(a+b\arcsin(cx))}dx$$

```
[In] int(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x)
[Out] int(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 63, normalized size of antiderivative = 2.86

$$\int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)/(a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*
b*d*e*x^2 + b*d^2)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 1.76 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{(d+ex^2)^{3/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(cx))\,(d+ex^2)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(e*x**2+d)**(3/2)/(a+b*asin(c*x)),x)
[Out] Integral(1/((a + b*asin(c*x))*(d + e*x**2)**(3/2)), x)
```

Maxima [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^{3/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex^2+d)^{\frac{3}{2}}(b\arcsin\,(cx)+a)}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((e*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^{3/2}\,(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex^2+d)^{\frac{3}{2}}(b\arcsin\,(cx)+a)}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^{3/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{1}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{3/2}}\,dx$$

```
[In] int(1/((a + b*asin(c*x))*(d + e*x^2)^(3/2)),x)
[Out] int(1/((a + b*asin(c*x))*(d + e*x^2)^(3/2)), x)
```

3.676 $\int \frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))}\,dx = \mathrm{Int}\left(\frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))}\,dx$$

```
[In] Int[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))}\,dx$$

Mathematica [N/A]

Not integrable

Time = 3.17 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))}\,dx$$

```
[In] Integrate[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])),x]
[Out] Integrate[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.07 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{(e\,x^2+d)^{\frac{5}{2}}\,(a+b\arcsin(cx))}dx$$

```
[In] int(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x)
[Out] int(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 87, normalized size of antiderivative = 3.95

$$\int \frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)/(a*e^3*x^6 + 3*a*d*e^2*x^4 + 3*a*d^2*e*x^2 + a*d^3
 + (b*e^3*x^6 + 3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 8.01 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(cx))\,(d+ex^2)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(e*x**2+d)**(5/2)/(a+b*asin(c*x)),x)
[Out] Integral(1/((a + b*asin(c*x))*(d + e*x**2)**(5/2)), x)
```

Maxima [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex^2+d)^{\frac{5}{2}}(b\arcsin\,(cx)+a)}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="maxima")
[Out] integrate(1/((e*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex^2+d)^{\frac{5}{2}}(b\arcsin\,(cx)+a)}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x)),x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^{5/2}\,(a+b\arcsin(cx))}\,dx=\int \frac{1}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{5/2}}\,dx$$

```
[In] int(1/((a + b*asin(c*x))*(d + e*x^2)^(5/2)),x)
[Out] int(1/((a + b*asin(c*x))*(d + e*x^2)^(5/2)), x)
```

3.677 $\int \frac{(d+ex^2)^2}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 498

$$\int \frac{(d+ex^2)^2}{(a+b\arcsin(cx))^2}\,dx = -\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{2dex^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{e^2x^4\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{d^2\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c} + \frac{de\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{2b^2c^3} + \frac{e^2\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8b^2c^5} - \frac{3de\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{2b^2c^3} - \frac{9e^2\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16b^2c^5} + \frac{5e^2\,\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{16b^2c^5} - \frac{d^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c} - \frac{de\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{2b^2c^3} - \frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^5} + \frac{3de\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{2b^2c^3} + \frac{9e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^5} - \frac{5e^2\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^5}$$

```
[Out] -d^2*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c-1/2*d*e*cos(a/b)*Si((a+b*arcsin
(c*x))/b)/b^2/c^3-1/8*e^2*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c^5+3/2*d*e*
cos(3*a/b)*Si(3*(a+b*arcsin(c*x))/b)/b^2/c^3+9/16*e^2*cos(3*a/b)*Si(3*(a+b*
arcsin(c*x))/b)/b^2/c^5-5/16*e^2*cos(5*a/b)*Si(5*(a+b*arcsin(c*x))/b)/b^2/c
^5+d^2*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c+1/2*d*e*Ci((a+b*arcsin(c*x))/
b)*sin(a/b)/b^2/c^3+1/8*e^2*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c^5-3/2*d*
e*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^3-9/16*e^2*Ci(3*(a+b*arcsin(c*
x))/b)*sin(3*a/b)/b^2/c^5+5/16*e^2*Ci(5*(a+b*arcsin(c*x))/b)*sin(5*a/b)/b^2
/c^5-d^2*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))-2*d*e*x^2*(-c^2*x^2+1)^(1
/2)/b/c/(a+b*arcsin(c*x))-e^2*x^4*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 498, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {4757, 4717, 4809, 3384, 3380, 3383, 4727}

$$\int \frac{(d+ex^2)^2}{(a+b\arcsin(cx))^2}\,dx = \frac{e^2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^5} - \frac{9e^2\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^5} + \frac{5e^2\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^5} - \frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^5} + \frac{9e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^5} - \frac{5e^2\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^5} + \frac{de\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{2b^2c^3} - \frac{3de\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{2b^2c^3} - \frac{de\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{2b^2c^3} + \frac{3de\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{2b^2c^3} + \frac{d^2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c} - \frac{d^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c} - \frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{2dex^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{e^2x^4\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(d + e*x^2)^2/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((d^2*Sqrt[1 - c^2*x^2])/(b*c*(a + b*ArcSin[c*x]))) - (2*d*e*x^2*Sqrt[1 -
c^2*x^2])/(b*c*(a + b*ArcSin[c*x])) - (e^2*x^4*Sqrt[1 - c^2*x^2])/(b*c*(a +
 b*ArcSin[c*x])) + (d^2*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b^2*c
) + (d*e*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(2*b^2*c^3) + (e^2*Co
sIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(8*b^2*c^5) - (3*d*e*CosIntegral
[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(2*b^2*c^3) - (9*e^2*CosIntegral[
(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(16*b^2*c^5) + (5*e^2*CosIntegral[
(5*(a + b*ArcSin[c*x]))/b]*Sin[(5*a)/b])/(16*b^2*c^5) - (d^2*Cos[a/b]*SinIn
```

```
tegral[(a + b*ArcSin[c*x])/b])/(b^2*c) - (d*e*Cos[a/b]*SinIntegral[(a + b*A
rcSin[c*x])/b])/(2*b^2*c^3) - (e^2*Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])
/b])/(8*b^2*c^5) + (3*d*e*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/
b])/(2*b^2*c^3) + (9*e^2*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c*x]))/b
])/(16*b^2*c^5) - (5*e^2*Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c*x]))/b
])/(16*b^2*c^5)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = \int \left(\frac{d^2}{(a+b\arcsin(cx))^2}+\frac{2dex^2}{(a+b\arcsin(cx))^2}+\frac{e^2x^4}{(a+b\arcsin(cx))^2}\right)dx$$

$$=d^2\int \frac{1}{(a+b\arcsin(cx))^2}\,dx+(2de)\int \frac{x^2}{(a+b\arcsin(cx))^2}\,dx+e^2\int \frac{x^4}{(a+b\arcsin(cx))^2}\,dx$$

$$=-\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{2dex^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{e^2x^4\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{(cd^2)\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx}{b}+\frac{(2de)\text{Subst}\left(\int \left(-\frac{3\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)dx,x,a+b\arcsin(cx)\right)}{b^2c^3}+\frac{e^2\text{Subst}\left(\int \left(\frac{5\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16x}-\frac{9\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16x}+\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{8x}\right)dx,x,a+b\arcsin(cx)\right)}{b^2c^5}$$

$$=-\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{2dex^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{e^2x^4\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}+\frac{d^2\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c}+\frac{(de)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3}-\frac{(3de)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3}+\frac{e^2\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8b^2c^5}+\frac{(5e^2)\,\text{Subst}\left(\int \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16b^2c^5}-\frac{(9e^2)\,\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16b^2c^5}$$

$$= -\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{2dex^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{e^2x^4\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$
$$- \frac{\left(d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c}$$
$$- \frac{\left(de\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3}$$
$$- \frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8b^2c^5}$$
$$+ \frac{\left(3de\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3}$$
$$+ \frac{\left(9e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16b^2c^5}$$
$$- \frac{\left(5e^2\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16b^2c^5}$$
$$+ \frac{\left(d^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{b^2c}$$
$$+ \frac{\left(de\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3}$$
$$+ \frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{8b^2c^5}$$
$$- \frac{\left(3de\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3}$$
$$- \frac{\left(9e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16b^2c^5}$$
$$+ \frac{\left(5e^2\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{5x}{b}\right)}{x}\,dx,x,a+b\arcsin(cx)\right)}{16b^2c^5}$$

$$= -\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{2dex^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{e^2x^4\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{d^2\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c} + \frac{de\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{2b^2c^3} + \frac{e^2\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8b^2c^5} - \frac{3de\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{2b^2c^3} - \frac{9e^2\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16b^2c^5} + \frac{5e^2\,\text{CosIntegral}\left(\frac{5(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{16b^2c^5} - \frac{d^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c} - \frac{de\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{2b^2c^3} - \frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{8b^2c^5} + \frac{3de\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{2b^2c^3} + \frac{9e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{16b^2c^5} - \frac{5e^2\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(cx))}{b}\right)}{16b^2c^5}$$

Mathematica [A] (verified)

Time = 1.99 (sec) , antiderivative size = 359, normalized size of antiderivative = 0.72

$$\int \frac{(d+ex^2)^2}{(a+b\arcsin(cx))^2}\,dx = -\frac{\frac{16bc^4d^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} + \frac{32bc^4dex^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} + \frac{16bc^4e^2x^4\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} - 2(8c^4d^2+4c^2de+e^2)\,\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{}$$

```
[In] Integrate[(d + e*x^2)^2/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/16*((16*b*c^4*d^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (32*b*c^4*d*e
*x^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (16*b*c^4*e^2*x^4*Sqrt[1 - c^
2*x^2])/(a + b*ArcSin[c*x]) - 2*(8*c^4*d^2 + 4*c^2*d*e + e^2)*CosIntegral[a
/b + ArcSin[c*x]]*Sin[a/b] + 3*e*(8*c^2*d + 3*e)*CosIntegral[3*(a/b + ArcSi
n[c*x])]*Sin[(3*a)/b] - 5*e^2*CosIntegral[5*(a/b + ArcSin[c*x])]*Sin[(5*a)/
b] + 16*c^4*d^2*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 8*c^2*d*e*Cos[a/b
]*SinIntegral[a/b + ArcSin[c*x]] + 2*e^2*Cos[a/b]*SinIntegral[a/b + ArcSin[
c*x]] - 24*c^2*d*e*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] - 9*e^2*
Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])] + 5*e^2*Cos[(5*a)/b]*SinInt
egral[5*(a/b + ArcSin[c*x])])/(b^2*c^5)
```

Maple [A] (verified)

Time = 0.42 (sec) , antiderivative size = 795, normalized size of antiderivative = 1.60

method	result	size
derivativedivides	Expression too large to display	795
default	Expression too large to display	795

[In] int((e*x^2+d)^2/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)

[Out] -1/16/c^5*(-3*cos(3*arcsin(c*x))*b*e^2-8*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b*c^2*d*e-24*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b*c^2*d*e+24*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b*c^2*d*e+8*arcsin(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*b*c^2*d*e+9*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b*e^2-5*Ci(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*a*e^2+2*Si(arcsin(c*x)+a/b)*cos(a/b)*a*e^2-2*Ci(arcsin(c*x)+a/b)*sin(a/b)*a*e^2-9*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a*e^2+9*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a*e^2+5*Si(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*a*e^2+16*(-c^2*x^2+1)^(1/2)*b*c^4*d^2+5*arcsin(c*x)*Si(5*arcsin(c*x)+5*a/b)*cos(5*a/b)*b*e^2-5*arcsin(c*x)*Ci(5*arcsin(c*x)+5*a/b)*sin(5*a/b)*b*e^2+16*Si(arcsin(c*x)+a/b)*cos(a/b)*a*c^4*d^2-16*Ci(arcsin(c*x)+a/b)*sin(a/b)*a*c^4*d^2-8*cos(3*arcsin(c*x))*b*c^2*d*e+2*arcsin(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*b*e^2-2*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b*e^2-9*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b*e^2+8*(-c^2*x^2+1)^(1/2)*b*c^2*d*e+cos(5*arcsin(c*x))*b*e^2+2*(-c^2*x^2+1)^(1/2)*b*e^2-8*Ci(arcsin(c*x)+a/b)*sin(a/b)*a*c^2*d*e-24*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a*c^2*d*e+24*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a*c^2*d*e+16*arcsin(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*b*c^4*d^2-16*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b*c^4*d^2+8*Si(arcsin(c*x)+a/b)*cos(a/b)*a*c^2*d*e)/(a+b*arcsin(c*x))/b^2

Fricas [F]

$$\int \frac{(d+ex^2)^2}{(a+b\arcsin(cx))^2}\,dx=\int \frac{(ex^2+d)^2}{(b\arcsin(cx)+a)^2}\,dx$$

[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")

[Out] integral((e^2*x^4 + 2*d*e*x^2 + d^2)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)

Sympy [F]

$$\int \frac{(d+ex^2)^2}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(d+ex^2)^2}{(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

[In] integrate((e*x**2+d)**2/(a+b*asin(c*x))**2,x)

[Out] Integral((d + e*x**2)**2/(a + b*asin(c*x))**2, x)

Maxima [F]

$$\int \frac{(d+ex^2)^2}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(ex^2+d)^2}{(b\arcsin(cx)+a)^2}\,dx$$

[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")

[Out] -((e^2*x^4 + 2*d*e*x^2 + d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1) - (b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integrate((5*c^2*e^2*x^5 + 2*(3*c^2*d*e - 2*e^2)*x^3 + (c^2*d^2 - 4*d*e)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2337 vs. $2(472) = 944$.

Time = 0.38 (sec) , antiderivative size = 2337, normalized size of antiderivative = 4.69

$$\int \frac{(d+ex^2)^2}{(a+b\arcsin(cx))^2}\,dx = \text{Too large to display}$$

[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")

[Out] 5*b*e^2*arcsin(c*x)*cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 6*b*c^2*d*e*arcsin(c*x)*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + b*c^4*d^2*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 5*b*e^2*arcsin(c*x)*cos(a/b)^5*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 6*b*c^2*d*e*arcsin(c*x)*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - b*c^4*d^2*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 5*a*e^2*cos(a/b)^4*cos_integral(5*a/b +

5*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 6*a*c^2*d*e*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + a*c^4*d^2*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 5*a*e^2*cos(a/b)^5*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 6*a*c^2*d*e*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - a*c^4*d^2*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 15/4*b*e^2*arcsin(c*x)*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 3/2*b*c^2*d*e*arcsin(c*x)*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 9/4*b*e^2*arcsin(c*x)*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 1/2*b*c^2*d*e*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 25/4*b*e^2*arcsin(c*x)*cos(a/b)^3*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 9/2*b*c^2*d*e*arcsin(c*x)*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 9/4*b*e^2*arcsin(c*x)*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 1/2*b*c^2*d*e*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - sqrt(-c^2*x^2 + 1)*b*c^4*d^2/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 15/4*a*e^2*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 3/2*a*c^2*d*e*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 9/4*a*e^2*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 1/2*a*c^2*d*e*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 25/4*a*e^2*cos(a/b)^3*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 9/2*a*c^2*d*e*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 9/4*a*e^2*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 1/2*a*c^2*d*e*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 2*(-c^2*x^2 + 1)^(3/2)*b*c^2*d*e/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 5/16*b*e^2*arcsin(c*x)*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 9/16*b*e^2*arcsin(c*x)*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 1/8*b*e^2*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 25/16*b*e^2*arcsin(c*x)*cos(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 27/16*b*e^2*arcsin(c*x)*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 1/8*b*e^2*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 2*sqrt(-c^2*x^2 + 1)*b*c^2*d*e/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - (c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^2/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 5/16*a*e^2*cos_integral(5*a/b + 5*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 9/16*a*e^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 1/8*a*e^2*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 25/16*a*e^2*cos(a/b)*sin_integral(5*a/b + 5*arcsin(c*x))/(b^3

```
*c^5*arcsin(c*x) + a*b^2*c^5) - 27/16*a*e^2*cos(a/b)*sin_integral(3*a/b + 3
*arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - 1/8*a*e^2*cos(a/b)*sin_in
tegral(a/b + arcsin(c*x))/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) + 2*(-c^2*x^2 +
 1)^(3/2)*b*e^2/(b^3*c^5*arcsin(c*x) + a*b^2*c^5) - sqrt(-c^2*x^2 + 1)*b*e^
2/(b^3*c^5*arcsin(c*x) + a*b^2*c^5)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex^2)^2}{(a+b\arcsin(cx))^2}\,dx=\int \frac{\left(e\,x^2+d\right)^2}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}\,dx$$

```
[In] int((d + e*x^2)^2/(a + b*asin(c*x))^2,x)
[Out] int((d + e*x^2)^2/(a + b*asin(c*x))^2, x)
```

3.678 $\int \frac{d+ex^2}{(a+b\arcsin(cx))^2} dx$

Optimal result

Integrand size = 18, antiderivative size = 249

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^2} dx = -\frac{d\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{ex^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{d\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c} + \frac{e\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4b^2c^3} - \frac{3e\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4b^2c^3} - \frac{d\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c} - \frac{e\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^3} + \frac{3e\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^3}$$

```
[Out] -d*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c-1/4*e*cos(a/b)*Si((a+b*arcsin(c*x
))/b)/b^2/c^3+3/4*e*cos(3*a/b)*Si(3*(a+b*arcsin(c*x))/b)/b^2/c^3+d*Ci((a+b*
arcsin(c*x))/b)*sin(a/b)/b^2/c+1/4*e*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c
^3-3/4*e*Ci(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^3-d*(-c^2*x^2+1)^(1/2)/
b/c/(a+b*arcsin(c*x))-e*x^2*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))
```

Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used = {4757, 4717, 4809, 3384, 3380, 3383, 4727}

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^2}\,dx=\frac{e\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^3}-\frac{3e\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^3}-\frac{e\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^3}+\frac{3e\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^3}+\frac{d\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{d\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{d\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{ex^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(d + e*x^2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -((d*Sqrt[1 - c^2*x^2])/(b*c*(a + b*ArcSin[c*x]))) - (e*x^2*Sqrt[1 - c^2*x^
2])/(b*c*(a + b*ArcSin[c*x])) + (d*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a
/b])/(b^2*c) + (e*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(4*b^2*c^3)
- (3*e*CosIntegral[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b^2*c^3) - (
d*Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2*c) - (e*Cos[a/b]*SinInt
egral[(a + b*ArcSin[c*x])/b])/(4*b^2*c^3) + (3*e*Cos[(3*a)/b]*SinIntegral[(
3*(a + b*ArcSin[c*x]))/b])/(4*b^2*c^3)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
```

```
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{d}{(a+b\arcsin(cx))^2}+\frac{ex^2}{(a+b\arcsin(cx))^2}\right)dx\\
&= d\int \frac{1}{(a+b\arcsin(cx))^2}\,dx+e\int \frac{x^2}{(a+b\arcsin(cx))^2}\,dx\\
&= -\frac{d\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{ex^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{(cd)\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx}{b}\\
&\quad+\frac{e\text{Subst}\left(\int \left(-\frac{3\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4x}+\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4x}\right)dx,x,a+b\arcsin(cx)\right)}{b^2c^3}
\end{aligned}$$

$$= -\frac{d\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{ex^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{d\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c} + \frac{e\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^3} - \frac{(3e)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^3}$$

$$= -\frac{d\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{ex^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c} - \frac{\left(e\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^3} + \frac{\left(3e\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^3} + \frac{\left(d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c} + \frac{\left(e\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^3} - \frac{\left(3e\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{3x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{4b^2c^3}$$

$$= -\frac{d\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{ex^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{d\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c} + \frac{e\,\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4b^2c^3} - \frac{3e\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4b^2c^3} - \frac{d\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c} - \frac{e\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^3} + \frac{3e\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^3}$$

Mathematica [A] (verified)

Time = 0.90 (sec) , antiderivative size = 191, normalized size of antiderivative = 0.77

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^2}\,dx = -\frac{\frac{4bc^2d\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}+\frac{4bc^2ex^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}-(4c^2d+e)\,\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)+3e\,\text{CosIntegral}\left(3\left(\frac{a}{b}+\text{a}\right.\right.}{}$$

```
[In] Integrate[(d + e*x^2)/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] -1/4*((4*b*c^2*d*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (4*b*c^2*e*x^2*Sq
rt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) - (4*c^2*d + e)*CosIntegral[a/b + ArcS
in[c*x]]*Sin[a/b] + 3*e*CosIntegral[3*(a/b + ArcSin[c*x])]*Sin[(3*a)/b] + 4
*c^2*d*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]] + e*Cos[a/b]*SinIntegral[a/b
 + ArcSin[c*x]] - 3*e*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])])/(b^2
*c^3)
```

Maple [A] (verified)

Time = 0.17 (sec) , antiderivative size = 376, normalized size of antiderivative = 1.51

method	result
derivativedivides	$-\frac{d\left(\arcsin(cx)\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b-\arcsin(cx)\,\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b+\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)a-\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\right.}{(a+b\arcsin(cx))b^2}$
default	$-\frac{d\left(\arcsin(cx)\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b-\arcsin(cx)\,\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b+\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)a-\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\right.}{(a+b\arcsin(cx))b^2}$

```
[In] int((e*x^2+d)/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/c*(-d*(arcsin(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*b-arcsin(c*x)*Ci(arcsin(c
*x)+a/b)*sin(a/b)*b+Si(arcsin(c*x)+a/b)*cos(a/b)*a-Ci(arcsin(c*x)+a/b)*sin(
a/b)*a+(-c^2*x^2+1)^(1/2)*b)/(a+b*arcsin(c*x))/b^2-1/4*e/c^2*(arcsin(c*x)*S
i(arcsin(c*x)+a/b)*cos(a/b)*b-arcsin(c*x)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b+Si
(arcsin(c*x)+a/b)*cos(a/b)*a-Ci(arcsin(c*x)+a/b)*sin(a/b)*a+(-c^2*x^2+1)^(1
/2)*b)/(a+b*arcsin(c*x))/b^2+1/4*e/c^2*(3*arcsin(c*x)*Si(3*arcsin(c*x)+3*a/
b)*cos(3*a/b)*b-3*arcsin(c*x)*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*b+3*Si(3*a
rcsin(c*x)+3*a/b)*cos(3*a/b)*a-3*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b)*a+cos(3
*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2)
```

Fricas [F]

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^2}\,dx = \int \frac{ex^2+d}{\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral((e*x^2 + d)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F]

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^2}\,dx = \int \frac{d+ex^2}{\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

```
[In] integrate((e*x**2+d)/(a+b*asin(c*x))**2,x)
[Out] Integral((d + e*x**2)/(a + b*asin(c*x))**2, x)
```

Maxima [F]

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^2}\,dx = \int \frac{ex^2+d}{\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -((e*x^2 + d)*sqrt(c*x + 1)*sqrt(-c*x + 1) - (b^2*c*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1)) + a*b*c)*integrate((3*c^2*e*x^3 + (c^2*d - 2*e)*x)*sqrt
(c*x + 1)*sqrt(-c*x + 1)/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x))/(b^2*c*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 891 vs. $2(237) = 474$.

Time = 0.36 (sec) , antiderivative size = 891, normalized size of antiderivative = 3.58

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^2}\,dx = \text{Too large to display}$$

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] -3*b*e*arcsin(c*x)*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/
(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + b*c^2*d*arcsin(c*x)*cos_integral(a/b +
arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 3*b*e*arcsin(c*x)
*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^
2*c^3) - b*c^2*d*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*
c^3*arcsin(c*x) + a*b^2*c^3) - 3*a*e*cos(a/b)^2*cos_integral(3*a/b + 3*arcs
in(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + a*c^2*d*cos_integral(
a/b + arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 3*a*e*cos(a
/b)^3*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
 - a*c^2*d*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^3*arcsin(c*x) +
a*b^2*c^3) + 3/4*b*e*arcsin(c*x)*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/
b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/4*b*e*arcsin(c*x)*cos_integral(a/b
 + arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9/4*b*e*arcsin
(c*x)*cos(a/b)*sin_integral(3*a/b + 3*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a
*b^2*c^3) - 1/4*b*e*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b
^3*c^3*arcsin(c*x) + a*b^2*c^3) - sqrt(-c^2*x^2 + 1)*b*c^2*d/(b^3*c^3*arcsi
n(c*x) + a*b^2*c^3) + 3/4*a*e*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/
(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/4*a*e*cos_integral(a/b + arcsin(c*x))
*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 9/4*a*e*cos(a/b)*sin_integral
(3*a/b + 3*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 1/4*a*e*cos(a/b
)*sin_integral(a/b + arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + (-c^2
*x^2 + 1)^(3/2)*b*e/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - sqrt(-c^2*x^2 + 1)*
b*e/(b^3*c^3*arcsin(c*x) + a*b^2*c^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^2}\,dx=\int \frac{e\,x^2+d}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}\,dx$$

```
[In] int((d + e*x^2)/(a + b*asin(c*x))^2,x)
[Out] int((d + e*x^2)/(a + b*asin(c*x))^2, x)
```

3.679 $\int \frac{1}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 86

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = -\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}+\frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c}-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}$$

```
[Out] -cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c+Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b^
2/c-(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))
```

Rubi [A] (verified)

Time = 0.10 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4717, 4809, 3384, 3380, 3383}

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \frac{\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

```
[In] Int[(a + b*ArcSin[c*x])^(-2),x]
```

```
[Out] -(Sqrt[1 - c^2*x^2]/(b*c*(a + b*ArcSin[c*x]))) + (CosIntegral[(a + b*ArcSin
[c*x])/b]*Sin[a/b])/(b^2*c) - (Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])
/(b^2*c)
```

Rule 3380

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3383

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3384

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Dist[Cos[(d*
e - c*f)/d], Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Dist[Sin[(d*e - c*f
)/d], Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x] &&
 NeQ[d*e - c*f, 0]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= -\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{c\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx}{b} \\
&= -\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c} \\
&= -\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} - \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c} \\
&\quad + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{x}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}
\end{aligned}$$

$$= -\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c} - \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}$$

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.84

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \frac{-\frac{b\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} + \text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right) - \cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^2c}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^(-2),x]
[Out] (-((b*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])) + CosIntegral[a/b + ArcSin[c*
x]]*Sin[a/b] - Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(b^2*c)
```

Maple [A] (verified)

Time = 0.06 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.88

method	result	size
derivativedivides	$\frac{-\frac{\sqrt{-c^2x^2+1}}{(a+b\arcsin(cx))b}-\frac{\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2}}{c}$	76
default	$\frac{-\frac{\sqrt{-c^2x^2+1}}{(a+b\arcsin(cx))b}-\frac{\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2}}{c}$	76

```
[In] int(1/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
[Out] 1/c*(-(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))/b-(Si(arcsin(c*x)+a/b)*cos(a/b)-
Ci(arcsin(c*x)+a/b)*sin(a/b))/b^2)
```

Fricas [F]

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(1/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

```
[In] integrate(1/(a+b*asin(c*x))**2,x)
[Out] Integral((a + b*asin(c*x))**(-2), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] ((b^2*c^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c^2)*integrate(s
qrt(c*x + 1)*sqrt(-c*x + 1)*x/(a*b*c^2*x^2 - a*b + (b^2*c^2*x^2 - b^2)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x) - sqrt(c*x + 1)*sqrt(-c*x + 1))
/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 192 vs. $2(84) = 168$.

Time = 0.28 (sec) , antiderivative size = 192, normalized size of antiderivative = 2.23

$$\begin{aligned}\int \frac{1}{(a+b\arcsin(cx))^2}\,dx &= \frac{b\arcsin\left(cx\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^3c\arcsin\left(cx\right)+ab^2c} \\ &\quad - \frac{b\arcsin\left(cx\right)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{b^3c\arcsin\left(cx\right)+ab^2c} \\ &\quad + \frac{a\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{b^3c\arcsin\left(cx\right)+ab^2c} \\ &\quad - \frac{a\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{b^3c\arcsin\left(cx\right)+ab^2c} - \frac{\sqrt{-c^2x^2+1}\,b}{b^3c\arcsin\left(cx\right)+ab^2c}\end{aligned}$$

```
[In] integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] b*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x) +
 a*b^2*c) - b*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c*a
rcsin(c*x) + a*b^2*c) + a*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c*a
rcsin(c*x) + a*b^2*c) - a*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c*a
rcsin(c*x) + a*b^2*c) - sqrt(-c^2*x^2 + 1)*b/(b^3*c*arcsin(c*x) + a*b^2*c)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2} \,d x$$

```
[In] int(1/(a + b*asin(c*x))^2,x)
[Out] int(1/(a + b*asin(c*x))^2, x)
```

3.680 $\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^2} \, dx$

Optimal result

Integrand size = 20, antiderivative size = 20

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^2} \, dx = \operatorname{Int}\left(\frac{1}{(d+ex^2)(a+b\arcsin(cx))^2}, x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.02 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^2} \, dx = \int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^2} \, dx$$

```
[In] Int[1/((d + e*x^2)*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][1/((d + e*x^2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^2} \, dx$$

Mathematica [N/A]

Not integrable

Time = 30.22 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.41 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00

$$\int \frac{1}{(e\,x^2+d)\,(a+b\arcsin(cx))^2}dx$$

```
[In] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x)
[Out] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 57, normalized size of antiderivative = 2.85

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{(ex^2+d)(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(1/(a^2*e*x^2 + a^2*d + (b^2*e*x^2 + b^2*d)*arcsin(c*x)^2 + 2*(a*b*
e*x^2 + a*b*d)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 41.36 (sec) , antiderivative size = 19, normalized size of antiderivative = 0.95

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(cx))^2\,(d+ex^2)}\,dx$$

```
[In] integrate(1/(e*x**2+d)/(a+b*asin(c*x))**2,x)
[Out] Integral(1/((a + b*asin(c*x))**2*(d + e*x**2)), x)
```

Maxima [N/A]

Not integrable

Time = 2.10 (sec) , antiderivative size = 320, normalized size of antiderivative = 16.00

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex^2+d)(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -((a*b*c*e*x^2 + a*b*c*d + (b^2*c*e*x^2 + b^2*c*d)*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)))*integrate((c^2*e*x^3 - (c^2*d + 2*e)*x)*sqrt(c*x + 1)*s
qrt(-c*x + 1)/(a*b*c^3*e^2*x^6 - a*b*c*d^2 + (2*a*b*c^3*d*e - a*b*c*e^2)*x^
4 + (a*b*c^3*d^2 - 2*a*b*c*d*e)*x^2 + (b^2*c^3*e^2*x^6 - b^2*c*d^2 + (2*b^2
*c^3*d*e - b^2*c*e^2)*x^4 + (b^2*c^3*d^2 - 2*b^2*c*d*e)*x^2)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1))), x) + sqrt(c*x + 1)*sqrt(-c*x + 1))/(a*b*c*e*
x^2 + a*b*c*d + (b^2*c*e*x^2 + b^2*c*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)))
```

Giac [N/A]

Not integrable

Time = 0.70 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex^2+d)(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c\,x))^2\,(e\,x^2+d)}\,dx$$

```
[In] int(1/((a + b*asin(c*x))^2*(d + e*x^2)),x)
[Out] int(1/((a + b*asin(c*x))^2*(d + e*x^2)), x)
```

3.681 $\int \frac{1}{(d+ex^2)^2(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 20

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^2}, x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.02 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^2),x]
[Out] Defer[Int][1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 53.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 4.26 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.00

$$\int \frac{1}{\left(e\,x^2+d\right)^2 \left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x)
[Out] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 98, normalized size of antiderivative = 4.90

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex^2+d)^2 (b\arcsin\left(cx\right)+a)^2}\,dx$$

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(1/(a^2*e^2*x^4 + 2*a^2*d*e*x^2 + a^2*d^2 + (b^2*e^2*x^4 + 2*b^2*d*
e*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*e^2*x^4 + 2*a*b*d*e*x^2 + a*b*d^2)*
arcsin(c*x)), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^2}\,dx = \text{Timed out}$$

```
[In] integrate(1/(e*x**2+d)**2/(a+b*asin(c*x))**2,x)
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 2.63 (sec) , antiderivative size = 439, normalized size of antiderivative = 21.95

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex^2+d)^2 (b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -((a*b*c*e^2*x^4 + 2*a*b*c*d*e*x^2 + a*b*c*d^2 + (b^2*c*e^2*x^4 + 2*b^2*c*d
*e*x^2 + b^2*c*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((
3*c^2*e*x^3 - (c^2*d + 4*e)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*b*c^3*e^3*x^
8 + (3*a*b*c^3*d*e^2 - a*b*c*e^3)*x^6 - a*b*c*d^3 + 3*(a*b*c^3*d^2*e - a*b*
c*d*e^2)*x^4 + (a*b*c^3*d^3 - 3*a*b*c*d^2*e)*x^2 + (b^2*c^3*e^3*x^8 + (3*b^
2*c^3*d*e^2 - b^2*c*e^3)*x^6 - b^2*c*d^3 + 3*(b^2*c^3*d^2*e - b^2*c*d*e^2)*
x^4 + (b^2*c^3*d^3 - 3*b^2*c*d^2*e)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))), x) + sqrt(c*x + 1)*sqrt(-c*x + 1))/(a*b*c*e^2*x^4 + 2*a*b*c*d*e*
x^2 + a*b*c*d^2 + (b^2*c*e^2*x^4 + 2*b^2*c*d*e*x^2 + b^2*c*d^2)*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [N/A]

Not integrable

Time = 7.94 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex^2+d)^2 (b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)^2*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.10

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c\,x))^2\,(e\,x^2+d)^2}\,dx$$

```
[In] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^2),x)
[Out] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^2), x)
```

3.682 $\int \frac{\sqrt{d+ex^2}}{(a+b\arcsin(cx))^2} dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{\sqrt{d+ex^2}}{(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{\sqrt{d+ex^2}}{(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{d+ex^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{d+ex^2}}{(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x])^2,x]
```

```
[Out] Defer[Int][Sqrt[d + e*x^2]/(a + b*ArcSin[c*x])^2, x]
```

Rubi steps

$$\text{integral} = \int \frac{\sqrt{d+ex^2}}{(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 7.39 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{\sqrt{d+ex^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{d+ex^2}}{(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x])^2,x]
[Out] Integrate[Sqrt[d + e*x^2]/(a + b*ArcSin[c*x])^2, x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.00 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{\sqrt{e\,x^2+d}}{\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
[Out] int((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.64

$$\int \frac{\sqrt{d+ex^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{ex^2+d}}{\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [N/A]

Not integrable

Time = 0.71 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{\sqrt{d+ex^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{d+ex^2}}{\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

```
[In] integrate((e*x**2+d)**(1/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(sqrt(d + e*x**2)/(a + b*asin(c*x))**2, x)
```

Maxima [N/A]

Not integrable

Time = 1.22 (sec) , antiderivative size = 236, normalized size of antiderivative = 10.73

$$\int \frac{\sqrt{d+ex^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{ex^2+d}}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

```
[Out] ((b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integrate((2*c^
2*e*x^3 + (c^2*d - e)*x)*sqrt(e*x^2 + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*b*
c^3*e*x^4 - a*b*c*d + (a*b*c^3*d - a*b*c*e)*x^2 + (b^2*c^3*e*x^4 - b^2*c*d
+ (b^2*c^3*d - b^2*c*e)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x
) - sqrt(e*x^2 + d)*sqrt(c*x + 1)*sqrt(-c*x + 1))/(b^2*c*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [N/A]

Not integrable

Time = 0.51 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{d+ex^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{ex^2+d}}{(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate((e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)/(b*arcsin(c*x) + a)^2, x)
```

Mupad [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{d+ex^2}}{(a+b\arcsin(cx))^2}\,dx = \int \frac{\sqrt{e\,x^2+d}}{(a+b\,\mathrm{asin}(c\,x))^2}\,dx$$

```
[In] int((d + e*x^2)^(1/2)/(a + b*asin(c*x))^2,x)
```

```
[Out] int((d + e*x^2)^(1/2)/(a + b*asin(c*x))^2, x)
```

3.683 $\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 15.44 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))^2} dx = \int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))^2} dx$$

```
[In] Integrate[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/(Sqrt[d + e*x^2]*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.08 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{\sqrt{e\,x^2+d}\,\left(a+b\arcsin\left(cx\right)\right)^2}dx$$

```
[In] int(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 67, normalized size of antiderivative = 3.05

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))^2} dx = \int \frac{1}{\sqrt{ex^2+d}(b\arcsin\left(cx\right)+a)^2} dx$$

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)/(a^2*e*x^2 + a^2*d + (b^2*e*x^2 + b^2*d)*arcsin(c*
x)^2 + 2*(a*b*e*x^2 + a*b*d)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 1.28 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\operatorname{asin}(cx))^2\sqrt{d+ex^2}}\,dx$$

```
[In] integrate(1/(e*x**2+d)**(1/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(1/((a + b*asin(c*x))**2*sqrt(d + e*x**2)), x)
```

Maxima [N/A]

Not integrable

Time = 1.58 (sec) , antiderivative size = 364, normalized size of antiderivative = 16.55

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\sqrt{ex^2+d}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] ((a*b*c^3*d^2 + a*b*c*d*e + (a*b*c^3*d*e + a*b*c*e^2)*x^2 + (b^2*c^3*d^2 +
b^2*c*d*e + (b^2*c^3*d*e + b^2*c*e^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1)))*integrate(sqrt(e*x^2 + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*x/(a*b*c
^3*e^2*x^6 - a*b*c*d^2 + (2*a*b*c^3*d*e - a*b*c*e^2)*x^4 + (a*b*c^3*d^2 - 2
*a*b*c*d*e)*x^2 + (b^2*c^3*e^2*x^6 - b^2*c*d^2 + (2*b^2*c^3*d*e - b^2*c*e^2
)*x^4 + (b^2*c^3*d^2 - 2*b^2*c*d*e)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c
*x + 1))), x) - sqrt(e*x^2 + d)*sqrt(c*x + 1)*sqrt(-c*x + 1))/(a*b*c*e*x^2
+ a*b*c*d + (b^2*c*e*x^2 + b^2*c*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
1)))
```

Giac [N/A]

Not integrable

Time = 0.39 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\sqrt{ex^2+d}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(1/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/(sqrt(e*x^2 + d)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{d+ex^2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,\sqrt{e\,x^2+d}}\,dx$$

```
[In] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^(1/2)),x)
[Out] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^(1/2)), x)
```

3.684 $\int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 25.69 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/((d + e*x^2)^(3/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.13 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{(e\,x^2+d)^{\frac{3}{2}}\,(a+b\arcsin(cx))^2}dx$$

```
[In] int(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 108, normalized size of antiderivative = 4.91

$$\int \frac{1}{(d+ex^2)^{3/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)/(a^2*e^2*x^4 + 2*a^2*d*e*x^2 + a^2*d^2 + (b^2*e^2*
x^4 + 2*b^2*d*e*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*e^2*x^4 + 2*a*b*d*e*x
^2 + a*b*d^2)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 4.93 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(cx))^2\,(d+ex^2)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(e*x**2+d)**(3/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(1/((a + b*asin(c*x))**2*(d + e*x**2)**(3/2)), x)
```

Maxima [N/A]

Not integrable

Time = 2.77 (sec) , antiderivative size = 457, normalized size of antiderivative = 20.77

$$\int \frac{1}{(d+ex^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -((a*b*c*e^2*x^4 + 2*a*b*c*d*e*x^2 + a*b*c*d^2 + (b^2*c*e^2*x^4 + 2*b^2*c*d
*e*x^2 + b^2*c*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((
2*c^2*e*x^3 - (c^2*d + 3*e)*x)*sqrt(e*x^2 + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)
/(a*b*c^3*e^3*x^8 + (3*a*b*c^3*d*e^2 - a*b*c*e^3)*x^6 - a*b*c*d^3 + 3*(a*b*
c^3*d^2*e - a*b*c*d*e^2)*x^4 + (a*b*c^3*d^3 - 3*a*b*c*d^2*e)*x^2 + (b^2*c^3
*e^3*x^8 + (3*b^2*c^3*d*e^2 - b^2*c*e^3)*x^6 - b^2*c*d^3 + 3*(b^2*c^3*d^2*e
 - b^2*c*d*e^2)*x^4 + (b^2*c^3*d^3 - 3*b^2*c*d^2*e)*x^2)*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))), x) + sqrt(e*x^2 + d)*sqrt(c*x + 1)*sqrt(-c*x + 1
))/(a*b*c*e^2*x^4 + 2*a*b*c*d*e*x^2 + a*b*c*d^2 + (b^2*c*e^2*x^4 + 2*b^2*c*
d*e*x^2 + b^2*c*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [N/A]

Not integrable

Time = 0.46 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(3/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)^(3/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^{3/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,\left(e\,x^2+d\right)^{3/2}}\,dx$$

```
[In] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^(3/2)),x)
[Out] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^(3/2)), x)
```

3.685 $\int \frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{1}{(d+ex^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{1}{(d+ex^2)^{5/2}\,(a+b\arcsin(cx))^2},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{(d+ex^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(d+ex^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx$$

```
[In] Int[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx$$

Mathematica [N/A]

Not integrable

Time = 47.13 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{1}{(d+ex^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(d+ex^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx$$

```
[In] Integrate[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])^2),x]
[Out] Integrate[1/((d + e*x^2)^(5/2)*(a + b*ArcSin[c*x])^2), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.18 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{\left(e\,x^{2}+d\right)^{\frac{5}{2}}\left(a+b\arcsin\left(cx\right)\right)^{2}}dx$$

```
[In] int(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x)
[Out] int(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 149, normalized size of antiderivative = 6.77

$$\int \frac{1}{(d+ex^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex^2+d)^{\frac{5}{2}}\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)/(a^2*e^3*x^6 + 3*a^2*d*e^2*x^4 + 3*a^2*d^2*e*x^2 +
 a^2*d^3 + (b^2*e^3*x^6 + 3*b^2*d*e^2*x^4 + 3*b^2*d^2*e*x^2 + b^2*d^3)*arcs
in(c*x)^2 + 2*(a*b*e^3*x^6 + 3*a*b*d*e^2*x^4 + 3*a*b*d^2*e*x^2 + a*b*d^3)*a
rcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 29.06 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(cx))^2\,(d+ex^2)^{\frac{5}{2}}}\,dx$$

```
[In] integrate(1/(e*x**2+d)**(5/2)/(a+b*asin(c*x))**2,x)
[Out] Integral(1/((a + b*asin(c*x))**2*(d + e*x**2)**(5/2)), x)
```

Maxima [N/A]

Not integrable

Time = 3.96 (sec) , antiderivative size = 579, normalized size of antiderivative = 26.32

$$\int \frac{1}{(d+ex^2)^{5/2}(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
[Out] -((a*b*c*e^3*x^6 + 3*a*b*c*d*e^2*x^4 + 3*a*b*c*d^2*e*x^2 + a*b*c*d^3 + (b^2
*c*e^3*x^6 + 3*b^2*c*d*e^2*x^4 + 3*b^2*c*d^2*e*x^2 + b^2*c*d^3)*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((4*c^2*e*x^3 - (c^2*d + 5*e)*x)*
sqrt(e*x^2 + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*b*c^3*e^4*x^10 + (4*a*b*c^3
*d*e^3 - a*b*c*e^4)*x^8 - a*b*c*d^4 + 2*(3*a*b*c^3*d^2*e^2 - 2*a*b*c*d*e^3)
*x^6 + 2*(2*a*b*c^3*d^3*e - 3*a*b*c*d^2*e^2)*x^4 + (a*b*c^3*d^4 - 4*a*b*c*d
^3*e)*x^2 + (b^2*c^3*e^4*x^10 + (4*b^2*c^3*d*e^3 - b^2*c*e^4)*x^8 - b^2*c*d
^4 + 2*(3*b^2*c^3*d^2*e^2 - 2*b^2*c*d*e^3)*x^6 + 2*(2*b^2*c^3*d^3*e - 3*b^2
*c*d^2*e^2)*x^4 + (b^2*c^3*d^4 - 4*b^2*c*d^3*e)*x^2)*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))), x) + sqrt(e*x^2 + d)*sqrt(c*x + 1)*sqrt(-c*x + 1))/(
a*b*c*e^3*x^6 + 3*a*b*c*d*e^2*x^4 + 3*a*b*c*d^2*e*x^2 + a*b*c*d^3 + (b^2*c*
e^3*x^6 + 3*b^2*c*d*e^2*x^4 + 3*b^2*c*d^2*e*x^2 + b^2*c*d^3)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [N/A]

Not integrable

Time = 0.51 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex^2+d)^{\frac{5}{2}}(b\arcsin{(cx)}+a)^2}\,dx$$

```
[In] integrate(1/(e*x^2+d)^(5/2)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)^(5/2)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^{5/2}\,(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c\,x))^2\,(e\,x^2+d)^{5/2}}\,dx$$

```
[In] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^(5/2)),x)
[Out] int(1/((a + b*asin(c*x))^2*(d + e*x^2)^(5/2)), x)
```

3.686 $\int (d+ex^2)^2 \sqrt{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 754

$$\int \left(d+ex^2\right)^2 \sqrt{a+b\arcsin(cx)}\,dx = d^2x\sqrt{a+b\arcsin(cx)}+\frac{2}{3}dex^3\sqrt{a+b\arcsin(cx)} +\frac{1}{5}e^2x^5\sqrt{a+b\arcsin(cx)} -\frac{\sqrt{b}d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c} -\frac{\sqrt{b}de\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2c^3} -\frac{\sqrt{b}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8c^5} +\frac{\sqrt{b}de\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{6c^3} +\frac{\sqrt{b}e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16c^5} -\frac{\sqrt{b}e^2\sqrt{\frac{\pi}{10}}\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{80c^5} +\frac{\sqrt{b}d^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{c} +\frac{\sqrt{b}de\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2c^3} +\frac{\sqrt{b}e^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{8c^5} -\frac{\sqrt{b}de\sqrt{\frac{\pi}{6}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{6c^3} -\frac{\sqrt{b}e^2\sqrt{\frac{\pi}{6}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{16c^5} +\frac{\sqrt{b}e^2\sqrt{\frac{\pi}{10}}\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{80c^5}$$

```
[Out] -1/800*e^2*cos(5*a/b)*FresnelS(10^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^
(1/2))*b^(1/2)*10^(1/2)*Pi^(1/2)/c^5+1/800*e^2*FresnelC(10^(1/2)/Pi^(1/2)*(
a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(5*a/b)*b^(1/2)*10^(1/2)*Pi^(1/2)/c^5+1/
36*d*e*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2)
)*b^(1/2)*6^(1/2)*Pi^(1/2)/c^3+1/96*e^2*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2
)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*b^(1/2)*6^(1/2)*Pi^(1/2)/c^5-1/36*d*e*Fr
esnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(3*a/b)*b^(1/2)
*6^(1/2)*Pi^(1/2)/c^3-1/96*e^2*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^
(1/2)/b^(1/2))*sin(3*a/b)*b^(1/2)*6^(1/2)*Pi^(1/2)/c^5-1/2*d^2*cos(a/b)*Fre
snelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*b^(1/2)*2^(1/2)*Pi^
(1/2)/c-1/4*d*e*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/
b^(1/2))*b^(1/2)*2^(1/2)*Pi^(1/2)/c^3-1/16*e^2*cos(a/b)*FresnelS(2^(1/2)/Pi
^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*b^(1/2)*2^(1/2)*Pi^(1/2)/c^5+1/2*d^
2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*b^(1/
2)*2^(1/2)*Pi^(1/2)/c+1/4*d*e*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(
1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/c^3+1/16*e^2*FresnelC(2^(1/
2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1
/2)/c^5+d^2*x*(a+b*arcsin(c*x))^(1/2)+2/3*d*e*x^3*(a+b*arcsin(c*x))^(1/2)+1
/5*e^2*x^5*(a+b*arcsin(c*x))^(1/2)
```

Rubi [A] (verified)

Time = 1.14 (sec) , antiderivative size = 754, normalized size of antiderivative = 1.00, number of steps used = 42, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.455, Rules

used = {4757, 4715, 4809, 3387, 3386, 3432, 3385, 3433, 4725, 3393}

$$\int \left(d+ex^2\right)^2 \sqrt{a+b\arcsin(cx)}\,dx = \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}e^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8c^5} - \frac{\sqrt{\frac{\pi}{6}}\sqrt{b}e^2\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16c^5} + \frac{\sqrt{\frac{\pi}{10}}\sqrt{b}e^2\sin\left(\frac{5a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{80c^5} - \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}e^2\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8c^5} + \frac{\sqrt{\frac{\pi}{6}}\sqrt{b}e^2\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16c^5} - \frac{\sqrt{\frac{\pi}{10}}\sqrt{b}e^2\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{80c^5} + \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}de\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2c^3} - \frac{\sqrt{\frac{\pi}{6}}\sqrt{b}de\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{6c^3} - \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}de\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2c^3} + \frac{\sqrt{\frac{\pi}{6}}\sqrt{b}de\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{6c^3} + \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}d^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c} - \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}d^2\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c} + d^2x\sqrt{a+b\arcsin(cx)} + \frac{2}{3}dex^3\sqrt{a+b\arcsin(cx)} + \frac{1}{5}e^2x^5\sqrt{a+b\arcsin(cx)}$$

```
[In] Int[(d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] d^2*x*Sqrt[a + b*ArcSin[c*x]] + (2*d*e*x^3*Sqrt[a + b*ArcSin[c*x]])/3 + (e^
2*x^5*Sqrt[a + b*ArcSin[c*x]])/5 - (Sqrt[b]*d^2*Sqrt[Pi/2]*Cos[a/b]*Fresnel
S[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/c - (Sqrt[b]*d*e*Sqrt[Pi/2
]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*c^3)
- (Sqrt[b]*e^2*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
*x]])/Sqrt[b]])/(8*c^5) + (Sqrt[b]*d*e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sq
rt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(6*c^3) + (Sqrt[b]*e^2*Sqrt[Pi/
6]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(16
*c^5) - (Sqrt[b]*e^2*Sqrt[Pi/10]*Cos[(5*a)/b]*FresnelS[(Sqrt[10/Pi]*Sqrt[a
+ b*ArcSin[c*x]])/Sqrt[b]])/(80*c^5) + (Sqrt[b]*d^2*Sqrt[Pi/2]*FresnelC[(Sq
rt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/c + (Sqrt[b]*d*e*Sqrt[
Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*c
^3) + (Sqrt[b]*e^2*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])
/Sqrt[b]]*Sin[a/b])/(8*c^5) - (Sqrt[b]*d*e*Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*
Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(6*c^3) - (Sqrt[b]*e^2*Sqrt
[Pi/6]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])
/(16*c^5) + (Sqrt[b]*e^2*Sqrt[Pi/10]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSi
n[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(80*c^5)
```

<u>Rule 3385</u>

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

<u>Rule 3386</u>

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

<u>Rule 3387</u>

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

<u>Rule 3393</u>

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

<u>Rule 3432</u>

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = \int \left(d^2\sqrt{a+b\arcsin(cx)} + 2dex^2\sqrt{a+b\arcsin(cx)} + e^2x^4\sqrt{a+b\arcsin(cx)}\right)\,dx$$

$$= d^2\int \sqrt{a+b\arcsin(cx)}\,dx + (2de)\int x^2\sqrt{a+b\arcsin(cx)}\,dx + e^2\int x^4\sqrt{a+b\arcsin(cx)}\,dx$$

$$= d^2x\sqrt{a+b\arcsin(cx)} + \frac{2}{3}dex^3\sqrt{a+b\arcsin(cx)} + \frac{1}{5}e^2x^5\sqrt{a+b\arcsin(cx)} - \frac{1}{2}(bcd^2)\int\frac{x}{\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx - \frac{1}{3}(bcde)\int\frac{x^3}{\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx - \frac{1}{10}(bce^2)\int\frac{x^5}{\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx$$

$$= d^2x\sqrt{a+b\arcsin(cx)} + \frac{2}{3}dex^3\sqrt{a+b\arcsin(cx)} + \frac{1}{5}e^2x^5\sqrt{a+b\arcsin(cx)} + \frac{d^2\text{Subst}\left(\int\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2c} + \frac{(de)\text{Subst}\left(\int\frac{\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{3c^3} + \frac{e^2\text{Subst}\left(\int\frac{\sin^5\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{10c^5}$$

$$= d^2x\sqrt{a+b\arcsin(cx)} + \frac{2}{3}dex^3\sqrt{a+b\arcsin(cx)} + \frac{1}{5}e^2x^5\sqrt{a+b\arcsin(cx)} + \frac{(de)\text{Subst}\left(\int\left(-\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}}+\frac{3\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right)dx,x,a+b\arcsin(cx)\right)}{3c^3} + \frac{e^2\text{Subst}\left(\int\left(\frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16\sqrt{x}}-\frac{5\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16\sqrt{x}}+\frac{5\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{8\sqrt{x}}\right)dx,x,a+b\arcsin(cx)\right)}{10c^5} - \frac{\left(d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2c} + \frac{\left(d^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2c}$$

$$= d^2x\sqrt{a+b\arcsin(cx)} + \frac{2}{3}dex^3\sqrt{a+b\arcsin(cx)} + \frac{1}{5}e^2x^5\sqrt{a+b\arcsin(cx)}$$
$$- \frac{(de)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{12c^3}$$
$$+ \frac{(de)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4c^3}$$
$$+ \frac{e^2\text{Subst}\left(\int \frac{\sin\left(\frac{5a}{b}-\frac{5x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{160c^5}$$
$$- \frac{e^2\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{32c^5}$$
$$+ \frac{e^2\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{16c^5}$$
$$- \frac{\left(d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{c}$$
$$+ \frac{\left(d^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{c}$$

$$
\begin{aligned}
&= d^2x\sqrt{a+b\arcsin(cx)}+\frac{2}{3}dex^3\sqrt{a+b\arcsin(cx)} \\
&+\frac{1}{5}e^2x^5\sqrt{a+b\arcsin(cx)}-\frac{\sqrt{b}d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c} \\
&+\frac{\sqrt{b}d^2\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{c} \\
&-\frac{\left(de\cos\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{4c^3} \\
&-\frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{16c^5} \\
&+\frac{\left(de\cos\left(\frac{3a}{b}\right)\right)\operatorname{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{12c^3} \\
&+\frac{\left(e^2\cos\left(\frac{3a}{b}\right)\right)\operatorname{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{32c^5} \\
&-\frac{\left(e^2\cos\left(\frac{5a}{b}\right)\right)\operatorname{Subst}\left(\int\frac{\sin\left(\frac{5x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{160c^5} \\
&+\frac{\left(de\sin\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{4c^3} \\
&+\frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\operatorname{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{16c^5} \\
&-\frac{\left(de\sin\left(\frac{3a}{b}\right)\right)\operatorname{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{12c^3} \\
&-\frac{\left(e^2\sin\left(\frac{3a}{b}\right)\right)\operatorname{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{32c^5} \\
&+\frac{\left(e^2\sin\left(\frac{5a}{b}\right)\right)\operatorname{Subst}\left(\int\frac{\cos\left(\frac{5x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{160c^5}
\end{aligned}
$$

$$
\begin{aligned}
&= d^2x\sqrt{a+b\arcsin(cx)}+\frac{2}{3}dex^3\sqrt{a+b\arcsin(cx)} \\
&+\frac{1}{5}e^2x^5\sqrt{a+b\arcsin(cx)}-\frac{\sqrt{b}d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c} \\
&+\frac{\sqrt{b}d^2\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{c} \\
&-\frac{\left(de\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{2c^3} \\
&-\frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{8c^5} \\
&+\frac{\left(de\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{6c^3} \\
&+\frac{\left(e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{16c^5} \\
&-\frac{\left(e^2\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{5x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{80c^5} \\
&+\frac{\left(de\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{2c^3} \\
&+\frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{8c^5} \\
&-\frac{\left(de\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{6c^3} \\
&-\frac{\left(e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{16c^5} \\
&+\frac{\left(e^2\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{5x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{80c^5}
\end{aligned}
$$

$$= d^2x\sqrt{a+b\arcsin(cx)} + \frac{2}{3}dex^3\sqrt{a+b\arcsin(cx)} + \frac{1}{5}e^2x^5\sqrt{a+b\arcsin(cx)} - \frac{\sqrt{b}d^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c} - \frac{\sqrt{b}de\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2c^3} - \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8c^5} + \frac{\sqrt{b}de\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{6c^3} + \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{16c^5} - \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{10}}\cos\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{80c^5} + \frac{\sqrt{b}d^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{c} + \frac{\sqrt{b}de\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2c^3} + \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{8c^5} - \frac{\sqrt{b}de\sqrt{\frac{\pi}{6}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{6c^3} - \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{6}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{16c^5} + \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{10}}\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{80c^5}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.07 (sec) , antiderivative size = 400, normalized size of antiderivative = 0.53

$$\int \left(d+ex^2\right)^2 \sqrt{a+b\arcsin(cx)}\,dx$$
$$= \frac{be^{-\frac{5ia}{b}}\left(450(8c^4d^2+4c^2de+e^2)\,e^{\frac{4ia}{b}}\sqrt{-\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(cx))}{b}\right)+450(8c^4d^2+4c^2de+e^2)\,e^{\frac{6ia}{b}}\right.}{}$$

```
[In] Integrate[(d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (b*(450*(8*c^4*d^2 + 4*c^2*d*e + e^2)*E^(((4*I)*a)/b)*Sqrt[((-I)*(a + b*Arc
Sin[c*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 450*(8*c^4*d^2 + 4
*c^2*d*e + e^2)*E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2,
(I*(a + b*ArcSin[c*x]))/b] - e*(25*Sqrt[3]*(8*c^2*d + 3*e)*E^(((2*I)*a)/b)*
Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-3*I)*(a + b*ArcSin[c*x]))/
b] + 25*Sqrt[3]*(8*c^2*d + 3*e)*E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x])
)/b]*Gamma[3/2, ((3*I)*(a + b*ArcSin[c*x]))/b] - 9*Sqrt[5]*e*(Sqrt[((-I)*(a
 + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] + E^(((10*
I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((5*I)*(a + b*ArcSin[c*
x]))/b]))))/(7200*c^5*E^(((5*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] (verified)

Time = 0.88 (sec) , antiderivative size = 1155, normalized size of antiderivative = 1.53

method	result	size
default	Expression too large to display	1155

```
[In] int((e*x^2+d)^2*(a+b*arcsin(c*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/7200/c^5*(-9*cos(5*a/b)*Pi^(1/2)*(-5/b)^(1/2)*2^(1/2)*FresnelS(5*2^(1/2)
/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*b
*e^2-9*Pi^(1/2)*(-5/b)^(1/2)*2^(1/2)*sin(5*a/b)*FresnelC(5*2^(1/2)/Pi^(1/2)
/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*b*e^2+90*a
rcsin(c*x)*sin(-5*(a+b*arcsin(c*x))/b+5*a/b)*b*e^2+90*sin(-5*(a+b*arcsin(c*
x))/b+5*a/b)*a*e^2-3600*Pi^(1/2)*2^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)
/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*(-1/b)^(1/
2)*b*c^4*d^2-3600*Pi^(1/2)*2^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b
)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*(-1/b)^(1/2)*b*c
^4*d^2-1800*Pi^(1/2)*2^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2
)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*(-1/b)^(1/2)*b*c^2*d*e
```

```
-1800*Pi^(1/2)*2^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b
*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*(-1/b)^(1/2)*b*c^2*d*e+7200*
arcsin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*b*c^4*d^2-450*Pi^(1/2)*2^(1/2)*co
s(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a
+b*arcsin(c*x))^(1/2)*(-1/b)^(1/2)*b*e^2-450*Pi^(1/2)*2^(1/2)*sin(a/b)*Fres
nelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c
*x))^(1/2)*(-1/b)^(1/2)*b*e^2+7200*sin(-(a+b*arcsin(c*x))/b+a/b)*a*c^4*d^2+
3600*arcsin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*b*c^2*d*e+3600*sin(-(a+b*arc
sin(c*x))/b+a/b)*a*c^2*d*e+900*arcsin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*b*
e^2+900*sin(-(a+b*arcsin(c*x))/b+a/b)*a*e^2+200*Pi^(1/2)*2^(1/2)*cos(3*a/b)
*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*a
rcsin(c*x))^(1/2)*(-3/b)^(1/2)*b*c^2*d*e+200*Pi^(1/2)*2^(1/2)*sin(3*a/b)*Fr
esnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcs
in(c*x))^(1/2)*(-3/b)^(1/2)*b*c^2*d*e+75*Pi^(1/2)*2^(1/2)*cos(3*a/b)*Fresne
lS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c
*x))^(1/2)*(-3/b)^(1/2)*b*e^2+75*Pi^(1/2)*2^(1/2)*sin(3*a/b)*FresnelC(3*2^(
1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/
2)*(-3/b)^(1/2)*b*e^2-1200*arcsin(c*x)*sin(-3*(a+b*arcsin(c*x))/b+3*a/b)*b*
c^2*d*e-1200*sin(-3*(a+b*arcsin(c*x))/b+3*a/b)*a*c^2*d*e-450*arcsin(c*x)*si
n(-3*(a+b*arcsin(c*x))/b+3*a/b)*b*e^2-450*sin(-3*(a+b*arcsin(c*x))/b+3*a/b)
*a*e^2)/(a+b*arcsin(c*x))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \left(d+ex^2\right)^2 \sqrt{a+b\arcsin(cx)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \left(d+ex^2\right)^2 \sqrt{a+b\arcsin(cx)}\,dx = \int \sqrt{a+b\,\mathrm{asin}\,(cx)}\left(d+ex^2\right)^2\,dx$$

```
[In] integrate((e*x**2+d)**2*(a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*asin(c*x))*(d + e*x**2)**2, x)
```

Maxima [F]

$$\int (d+ex^2)^2 \sqrt{a+b\arcsin(cx)}\,dx = \int (ex^2+d)^2 \sqrt{b\arcsin(cx)+a}\,dx$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
[Out] integrate((e*x^2 + d)^2*sqrt(b*arcsin(c*x) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.86 (sec) , antiderivative size = 3216, normalized size of antiderivative = 4.27

$$\int (d+ex^2)^2 \sqrt{a+b\arcsin(cx)}\,dx = \text{Too large to display}$$

```
[In] integrate((e*x^2+d)^2*(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
[Out] 1/480*(240*sqrt(2)*sqrt(pi)*a*b*c^4*d^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*
x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*
e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 120*I*sqrt(2)*sqrt(pi)*b^
2*c^4*d^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqr
t(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b))
+ b*sqrt(abs(b))) + 240*sqrt(2)*sqrt(pi)*a*b*c^4*d^2*erf(1/2*I*sqrt(2)*sqrt
(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt
(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) - 120*I*sqrt(
2)*sqrt(pi)*b^2*c^4*d^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(
b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^
2/sqrt(abs(b)) + b*sqrt(abs(b))) - 480*sqrt(pi)*a*c^4*d^2*erf(-1/2*I*sqrt(2
)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a
)*sqrt(abs(b))/b)*e^(I*a/b)/(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)
)) - 480*sqrt(pi)*a*c^4*d^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(
abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-
I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) + 120*sqrt(2)*sqrt(pi)*a*b
*c^2*d*e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt
(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) +
 b*sqrt(abs(b))) + 60*I*sqrt(2)*sqrt(pi)*b^2*c^2*d*e*erf(-1/2*I*sqrt(2)*sqr
t(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqr
t(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 120*sqrt(2)*
sqrt(pi)*a*b*c^2*d*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b))
 - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/s
qrt(abs(b)) + b*sqrt(abs(b))) - 60*I*sqrt(2)*sqrt(pi)*b^2*c^2*d*e*erf(1/2*I
*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c
```

*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))
- 240*I*sqrt(b*arcsin(c*x) + a)*c^4*d^2*e^(I*arcsin(c*x)) + 240*I*sqrt(b*ar
csin(c*x) + a)*c^4*d^2*e^(-I*arcsin(c*x)) - 240*sqrt(pi)*a*sqrt(b)*c^2*d*e*
erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arc
sin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*b + I*sqrt(6)*b^2/abs(b)
) - 40*I*sqrt(pi)*b^(3/2)*c^2*d*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/
sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)
/(sqrt(6)*b + I*sqrt(6)*b^2/abs(b)) - 240*sqrt(pi)*a*sqrt(b)*c^2*d*e*erf(-1
/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*
x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*b - I*sqrt(6)*b^2/abs(b)) + 4
0*I*sqrt(pi)*b^(3/2)*c^2*d*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(
b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sq
rt(6)*b - I*sqrt(6)*b^2/abs(b)) + 240*sqrt(pi)*a*c^2*d*e*erf(-1/2*sqrt(6)*s
qrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt
(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(b)) - 240*
sqrt(pi)*a*c^2*d*e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b))
- 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*sqrt(2)*
b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) - 240*sqrt(pi)*a*c^2*d*e*erf(1/2*I*s
qrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x
) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt
(abs(b))) + 240*sqrt(pi)*a*c^2*d*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)
/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/
b)/(sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs(b)) + 30*sqrt(2)*sqrt(pi)*a*b*e
^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sq
rt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqr
t(abs(b))) + 15*I*sqrt(2)*sqrt(pi)*b^2*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin
(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/
b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 30*sqrt(2)*sqrt(pi)*a*
b*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*
sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b
*sqrt(abs(b))) - 15*I*sqrt(2)*sqrt(pi)*b^2*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arc
sin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b
))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 40*I*sqrt(b*arcsi
n(c*x) + a)*c^2*d*e*e^(3*I*arcsin(c*x)) - 120*I*sqrt(b*arcsin(c*x) + a)*c^2
*d*e*e^(I*arcsin(c*x)) + 120*I*sqrt(b*arcsin(c*x) + a)*c^2*d*e*e^(-I*arcsin
(c*x)) - 40*I*sqrt(b*arcsin(c*x) + a)*c^2*d*e*e^(-3*I*arcsin(c*x)) - 15*sqr
t(6)*sqrt(pi)*a*sqrt(b)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b
) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(b +
I*b^2/abs(b)) - 15*sqrt(6)*sqrt(pi)*a*sqrt(b)*e^2*erf(-1/2*sqrt(6)*sqrt(b*a
rcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs
(b))*e^(-3*I*a/b)/(b - I*b^2/abs(b)) + 30*sqrt(pi)*a*sqrt(b)*e^2*erf(-1/2*s
qrt(10)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(10)*sqrt(b*arcsin(c*x)
 + a)*sqrt(b)/abs(b))*e^(5*I*a/b)/(sqrt(10)*b + I*sqrt(10)*b^2/abs(b)) + 3*
I*sqrt(pi)*b^(3/2)*e^2*erf(-1/2*sqrt(10)*sqrt(b*arcsin(c*x) + a)/sqrt(b) -
1/2*I*sqrt(10)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(5*I*a/b)/(sqrt(10

```
)*b + I*sqrt(10)*b^2/abs(b)) - 15*I*sqrt(pi)*b^(3/2)*e^2*erf(-1/2*sqrt(6)*s
qrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt
(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*b + I*sqrt(6)*b^2/abs(b)) + 15*I*sqrt(pi)*
b^(3/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6
)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*b - I*sqrt(
6)*b^2/abs(b)) + 30*sqrt(pi)*a*sqrt(b)*e^2*erf(-1/2*sqrt(10)*sqrt(b*arcsin(
c*x) + a)/sqrt(b) + 1/2*I*sqrt(10)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*
e^(-5*I*a/b)/(sqrt(10)*b - I*sqrt(10)*b^2/abs(b)) - 3*I*sqrt(pi)*b^(3/2)*e^
2*erf(-1/2*sqrt(10)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(10)*sqrt(b
*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-5*I*a/b)/(sqrt(10)*b - I*sqrt(10)*b^2
/abs(b)) - 30*sqrt(pi)*a*e^2*erf(-1/2*sqrt(10)*sqrt(b*arcsin(c*x) + a)/sqrt
(b) - 1/2*I*sqrt(10)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(5*I*a/b)/(s
qrt(10)*sqrt(b) + I*sqrt(10)*b^(3/2)/abs(b)) - 60*sqrt(pi)*a*e^2*erf(-1/2*I
*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c
*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt
(abs(b))) - 60*sqrt(pi)*a*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqr
t(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/
(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) - 30*sqrt(pi)*a*e^2*erf(
-1/2*sqrt(10)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(10)*sqrt(b*arcsi
n(c*x) + a)*sqrt(b)/abs(b))*e^(-5*I*a/b)/(sqrt(10)*sqrt(b) - I*sqrt(10)*b^(
3/2)/abs(b)) + 90*sqrt(pi)*a*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/s
qrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/
(sqrt(b)*(sqrt(6) + I*sqrt(6)*b/abs(b))) + 90*sqrt(pi)*a*e^2*erf(-1/2*sqrt(
6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*
sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(b)*(sqrt(6) - I*sqrt(6)*b/abs(b))) - 3*I
*sqrt(b*arcsin(c*x) + a)*e^2*e^(5*I*arcsin(c*x)) + 15*I*sqrt(b*arcsin(c*x)
+ a)*e^2*e^(3*I*arcsin(c*x)) - 30*I*sqrt(b*arcsin(c*x) + a)*e^2*e^(I*arcsin
(c*x)) + 30*I*sqrt(b*arcsin(c*x) + a)*e^2*e^(-I*arcsin(c*x)) - 15*I*sqrt(b*
arcsin(c*x) + a)*e^2*e^(-3*I*arcsin(c*x)) + 3*I*sqrt(b*arcsin(c*x) + a)*e^2
*e^(-5*I*arcsin(c*x)))/c^5
```

Mupad [F(-1)]

Timed out.

$$\int \left(d+ex^2\right)^2 \sqrt{a+b\arcsin(cx)}\,dx = \int \sqrt{a+b\,\mathrm{asin}\left(c\,x\right)}\,\left(e\,x^2+d\right)^2\,dx$$

```
[In] int((a + b*asin(c*x))^(1/2)*(d + e*x^2)^2,x)
[Out] int((a + b*asin(c*x))^(1/2)*(d + e*x^2)^2, x)
```

3.687 $\int (d+ex^2) \sqrt{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 369

$$\int (d+ex^2) \sqrt{a+b\arcsin(cx)}\,dx = dx\sqrt{a+b\arcsin(cx)} + \frac{1}{3}ex^3\sqrt{a+b\arcsin(cx)} - \frac{\sqrt{b}d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c} - \frac{\sqrt{b}e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4c^3} + \frac{\sqrt{b}e\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{12c^3} + \frac{\sqrt{b}d\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{c} + \frac{\sqrt{b}e\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4c^3} - \frac{\sqrt{b}e\sqrt{\frac{\pi}{6}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{12c^3}$$

```
[Out] 1/72*e*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2)
)*b^(1/2)*6^(1/2)*Pi^(1/2)/c^3-1/72*e*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin
(c*x))^(1/2)/b^(1/2))*sin(3*a/b)*b^(1/2)*6^(1/2)*Pi^(1/2)/c^3-1/2*d*cos(a/b
)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*b^(1/2)*2^(1/2
)*Pi^(1/2)/c-1/8*e*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/
```

```
2)/b^(1/2))*b^(1/2)*2^(1/2)*Pi^(1/2)/c^3+1/2*d*FresnelC(2^(1/2)/Pi^(1/2)*(a
+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/c+1/8*e*Fr
esnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2
^(1/2)*Pi^(1/2)/c^3+d*x*(a+b*arcsin(c*x))^(1/2)+1/3*e*x^3*(a+b*arcsin(c*x))
^(1/2)
```

Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 369, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {4757, 4715, 4809, 3387, 3386, 3432, 3385, 3433, 4725, 3393}

$$\int (d+ex^2)\sqrt{a+b\arcsin(cx)}\,dx = \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}e\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4c^3} - \frac{\sqrt{\frac{\pi}{6}}\sqrt{b}e\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{12c^3} - \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}e\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4c^3} + \frac{\sqrt{\frac{\pi}{6}}\sqrt{b}e\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{12c^3} + \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c} - \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}d\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c} + dx\sqrt{a+b\arcsin(cx)} + \frac{1}{3}ex^3\sqrt{a+b\arcsin(cx)}$$

```
[In] Int[(d + e*x^2)*Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] d*x*Sqrt[a + b*ArcSin[c*x]] + (e*x^3*Sqrt[a + b*ArcSin[c*x]])/3 - (Sqrt[b]*
d*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]
])/c - (Sqrt[b]*e*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSi
n[c*x]])/Sqrt[b]])/(4*c^3) + (Sqrt[b]*e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(S
qrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(12*c^3) + (Sqrt[b]*d*Sqrt[Pi/
2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/c + (Sq
rt[b]*e*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*S
in[a/b])/(4*c^3) - (Sqrt[b]*e*Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*Ar
cSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(12*c^3)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3393

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
```

```
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$
\begin{aligned}
\text{integral} &= \int \left(d\sqrt{a+b\arcsin(cx)}+ex^2\sqrt{a+b\arcsin(cx)}\right)\,dx\\
&= d\int \sqrt{a+b\arcsin(cx)}\,dx+e\int x^2\sqrt{a+b\arcsin(cx)}\,dx\\
&= dx\sqrt{a+b\arcsin(cx)}+\frac{1}{3}ex^3\sqrt{a+b\arcsin(cx)}\\
&\quad-\frac{1}{2}(bcd)\int \frac{x}{\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx\\
&\quad-\frac{1}{6}(bce)\int \frac{x^3}{\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx\\
&= dx\sqrt{a+b\arcsin(cx)}+\frac{1}{3}ex^3\sqrt{a+b\arcsin(cx)}\\
&\quad+\frac{d\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2c}\\
&\quad+\frac{e\text{Subst}\left(\int \frac{\sin^3\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{6c^3}
\end{aligned}
$$

$$= dx\sqrt{a+b\arcsin(cx)}+\frac{1}{3}ex^3\sqrt{a+b\arcsin(cx)}$$
$$+\frac{e\text{Subst}\left(\int\left(-\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}}+\frac{3\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right)dx,x,a+b\arcsin(cx)\right)}{6c^3}$$
$$-\frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{2c}$$
$$+\frac{\left(d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{2c}$$
$$= dx\sqrt{a+b\arcsin(cx)}+\frac{1}{3}ex^3\sqrt{a+b\arcsin(cx)}$$
$$-\frac{e\text{Subst}\left(\int\frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{24c^3}$$
$$+\frac{e\text{Subst}\left(\int\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{8c^3}$$
$$-\frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(cx)}\right)}{c}$$
$$+\frac{\left(d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(cx)}\right)}{c}$$
$$= dx\sqrt{a+b\arcsin(cx)}+\frac{1}{3}ex^3\sqrt{a+b\arcsin(cx)}$$
$$-\frac{\sqrt{b}d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c}$$
$$+\frac{\sqrt{b}d\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{c}$$
$$-\frac{\left(e\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{8c^3}$$
$$+\frac{\left(e\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{24c^3}$$
$$+\frac{\left(e\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{8c^3}$$
$$-\frac{\left(e\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{24c^3}$$

$$= dx\sqrt{a+b\arcsin(cx)}+\frac{1}{3}ex^3\sqrt{a+b\arcsin(cx)}$$
$$-\frac{\sqrt{b}d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c}$$
$$+\frac{\sqrt{b}d\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{c}$$
$$-\frac{\left(e\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4c^3}$$
$$+\frac{\left(e\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{12c^3}$$
$$+\frac{\left(e\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{4c^3}$$
$$-\frac{\left(e\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{12c^3}$$

$$= dx\sqrt{a+b\arcsin(cx)}+\frac{1}{3}ex^3\sqrt{a+b\arcsin(cx)}$$
$$-\frac{\sqrt{b}d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c}$$
$$-\frac{\sqrt{b}e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4c^3}$$
$$+\frac{\sqrt{b}e\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{12c^3}$$
$$+\frac{\sqrt{b}d\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{c}$$
$$+\frac{\sqrt{b}e\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4c^3}$$
$$-\frac{\sqrt{b}e\sqrt{\frac{\pi}{6}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{12c^3}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.41 (sec) , antiderivative size = 244, normalized size of antiderivative = 0.66

$$\int (d + ex^2) \sqrt{a + b \arcsin(cx)} \, dx$$

$$= \frac{be^{-\frac{3ia}{b}} \left(9(4c^2d + e) e^{\frac{2ia}{b}} \sqrt{-\frac{i(a+b\arcsin(cx))}{b}} \Gamma\left(\frac{3}{2}, -\frac{i(a+b\arcsin(cx))}{b}\right) + 9(4c^2d + e) e^{\frac{4ia}{b}} \sqrt{\frac{i(a+b\arcsin(cx))}{b}} \Gamma\left(\frac{3}{2}, \frac{i(a+\right.}{}\right.}{72c^3\sqrt{a+}}$$

```
[In] Integrate[(d + e*x^2)*Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (b*(9*(4*c^2*d + e)*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamm
a[3/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 9*(4*c^2*d + e)*E^(((4*I)*a)/b)*Sqrt
[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, (I*(a + b*ArcSin[c*x]))/b] - Sqrt[3]
*e*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-3*I)*(a + b*ArcSin[c*x
]))/b] + E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((3*I)*
(a + b*ArcSin[c*x]))/b])))/(72*c^3*E^(((3*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] (verified)

Time = 0.40 (sec) , antiderivative size = 557, normalized size of antiderivative = 1.51

method	result
default	$\frac{36\sqrt{-\frac{1}{b}}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{a+b\arcsin(cx)}\,\sqrt{2}\,\sqrt{\pi}\,b\,c^2d+36\sqrt{-\frac{1}{b}}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{a+b}}{}$

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/72/c^3*(36*(-1/b)^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(
a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*2^(1/2)*Pi^(1/2)*b*c^2*d+
36*(-1/b)^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin
(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*2^(1/2)*Pi^(1/2)*b*c^2*d+9*(-1/b)^(
1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2
)/b)*(a+b*arcsin(c*x))^(1/2)*2^(1/2)*Pi^(1/2)*b*e+9*(-1/b)^(1/2)*sin(a/b)*F
resnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsi
n(c*x))^(1/2)*2^(1/2)*Pi^(1/2)*b*e-cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(
-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*2^(1/2)*Pi^(
1/2)*(-3/b)^(1/2)*b*e-sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(
a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*2^(1/2)*Pi^(1/2)*(-3/b)^(
1/2)*b*e-72*arcsin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*b*c^2*d-72*sin(-(a+b*
arcsin(c*x))/b+a/b)*a*c^2*d+6*arcsin(c*x)*sin(-3*(a+b*arcsin(c*x))/b+3*a/b)
*b*e-18*arcsin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*b*e+6*sin(-3*(a+b*arcsin(
```

```
c*x))/b+3*a/b)*a*e-18*sin(-(a+b*arcsin(c*x))/b+a/b)*a*e)/(a+b*arcsin(c*x))^
(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int (d+ex^2) \sqrt{a+b\arcsin(cx)}\, dx = \text{Exception raised: TypeError}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int (d+ex^2) \sqrt{a+b\arcsin(cx)}\, dx = \int \sqrt{a+b\operatorname{asin}(cx)}(d+ex^2)\, dx$$

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))**(1/2),x)
[Out] Integral(sqrt(a + b*asin(c*x))*(d + e*x**2), x)
```

Maxima [F]

$$\int (d+ex^2) \sqrt{a+b\arcsin(cx)}\, dx = \int (ex^2+d)\sqrt{b\arcsin(cx)+a}\, dx$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
[Out] integrate((e*x^2 + d)*sqrt(b*arcsin(c*x) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.31 (sec) , antiderivative size = 1661, normalized size of antiderivative = 4.50

$$\int (d+ex^2) \sqrt{a+b\arcsin(cx)}\, dx = \text{Too large to display}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

[Out] 1/2*sqrt(2)*sqrt(pi)*a*b^2*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c) + 1/4*I*sqrt(2)*sqrt(pi)*b^3*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c) + 1/2*sqrt(2)*sqrt(pi)*a*b^2*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c) - 1/4*I*sqrt(2)*sqrt(pi)*b^3*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c) - sqrt(pi)*a*b*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*c) - sqrt(pi)*a*b*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*c) + 1/8*sqrt(2)*sqrt(pi)*a*b^2*e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c^3) + 1/16*I*sqrt(2)*sqrt(pi)*b^3*e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c^3) + 1/8*sqrt(2)*sqrt(pi)*a*b^2*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c^3) - 1/16*I*sqrt(2)*sqrt(pi)*b^3*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c^3) - 1/4*sqrt(pi)*a*b^(3/2)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*b^2 + I*sqrt(6)*b^3/abs(b))*c^3) - 1/24*I*sqrt(pi)*b^(5/2)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*b^2 + I*sqrt(6)*b^3/abs(b))*c^3) - 1/4*sqrt(pi)*a*b^(3/2)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*b^2 - I*sqrt(6)*b^3/abs(b))*c^3) + 1/24*I*sqrt(pi)*b^(5/2)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*b^2 - I*sqrt(6)*b^3/abs(b))*c^3) - 1/2*I*sqrt(b*arcsin(c*x) + a)*d*e^(I*arcsin(c*x))/c + 1/2*I*sqrt(b*arcsin(c*x) + a)*d*e^(-I*arcsin(c*x))/c + 1/4*sqrt(pi)*a*b*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*b^(3/2) + I*sqrt(6)*b^(5/2)/abs(b))*c^3) - 1/4*sqrt(pi)*a*b*e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*c^3) - 1/4*sqrt(pi)*a*b*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*sqrt(2)*b^2/sqr

```
t(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*c^3) + 1/4*sqrt(pi)*a*b*e*erf(-1/2*sqrt
(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)
*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*b^(3/2) - I*sqrt(6)*b^(5/2)/abs(b))
*c^3) + 1/24*I*sqrt(b*arcsin(c*x) + a)*e*e^(3*I*arcsin(c*x))/c^3 - 1/8*I*sq
rt(b*arcsin(c*x) + a)*e*e^(I*arcsin(c*x))/c^3 + 1/8*I*sqrt(b*arcsin(c*x) +
a)*e*e^(-I*arcsin(c*x))/c^3 - 1/24*I*sqrt(b*arcsin(c*x) + a)*e*e^(-3*I*arcs
in(c*x))/c^3
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex^2)\sqrt{a+b\arcsin(cx)}\,dx=\int \sqrt{a+b\,\mathrm{asin}\left(c\,x\right)}\,\left(e\,x^2+d\right)\,dx$$

```
[In] int((a + b*asin(c*x))^(1/2)*(d + e*x^2),x)
[Out] int((a + b*asin(c*x))^(1/2)*(d + e*x^2), x)
```

3.688 $\int \sqrt{a+b \arcsin(cx)}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 120

$$\int \sqrt{a+b \arcsin(cx)}\,dx = x\sqrt{a+b \arcsin(cx)} - \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c} + \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{c}$$

```
[Out] -1/2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*b^
(1/2)*2^(1/2)*Pi^(1/2)/c+1/2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1
/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/c+x*(a+b*arcsin(c*x))^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {4715, 4809, 3387, 3386, 3432, 3385, 3433}

$$\int \sqrt{a+b \arcsin(cx)}\,dx = \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c} - \frac{\sqrt{\frac{\pi}{2}}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c} + x\sqrt{a+b\arcsin(cx)}$$

```
[In] Int[Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] x*Sqrt[a + b*ArcSin[c*x]] - (Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/P
i]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/c + (Sqrt[b]*Sqrt[Pi/2]*FresnelC[(Sqr
t[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/c
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = x\sqrt{a+b\arcsin(cx)} - \frac{1}{2}(bc)\int \frac{x}{\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx$$

$$= x\sqrt{a+b\arcsin(cx)} + \frac{\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{2c}$$

$$= x\sqrt{a+b\arcsin(cx)} - \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{2c} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{2c}$$

$$= x\sqrt{a+b\arcsin(cx)} - \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{c} + \frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{c}$$

$$= x\sqrt{a+b\arcsin(cx)} - \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{c} + \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{c}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.06 (sec) , antiderivative size = 119, normalized size of antiderivative = 0.99

$$\int \sqrt{a+b\arcsin(cx)}\,dx = \frac{be^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(cx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(cx))}{b}\right)\right)}{2c\sqrt{a+b\arcsin(cx)}}$$

```
[In] Integrate[Sqrt[a + b*ArcSin[c*x]],x]
[Out] (b*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c*x])
)/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, (I*(a + b
*ArcSin[c*x]))/b]))/(2*c*E^((I*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 187, normalized size of antiderivative = 1.56

method	result
default	$-\frac{-\cos\left(\frac{a}{b}\right) \operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(cx)}\,b-\sin\left(\frac{a}{b}\right) \operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+}}{2c\sqrt{a+b\arcsin(cx)}}$

```
[In] int((a+b*arcsin(c*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/c/(a+b*arcsin(c*x))^(1/2)*(-cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^
(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(
c*x))^(1/2)*b-sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c
*x))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*b+2*arc
sin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*b+2*sin(-(a+b*arcsin(c*x))/b+a/b)*a)
```

Fricas [F(-2)]

Exception generated.

$$\int \sqrt{a+b\arcsin(cx)}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \sqrt{a+b\arcsin(cx)}\,dx = \int \sqrt{a+b\operatorname{asin}(cx)}\,dx$$

```
[In] integrate((a+b*asin(c*x))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \sqrt{a+b\arcsin(cx)}\,dx = \int \sqrt{b\arcsin\left(cx\right)+a}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(b*arcsin(c*x) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.56 (sec) , antiderivative size = 531, normalized size of antiderivative = 4.42

$$\begin{aligned}\int \sqrt{a+b\arcsin(cx)}\,dx = {} & \frac{\sqrt{2}\sqrt{\pi}ab\,\mathrm{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{2\left(\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)c} \\
& + \frac{i\sqrt{2}\sqrt{\pi}b^2\,\mathrm{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{4\left(\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)c} \\
& + \frac{\sqrt{2}\sqrt{\pi}ab\,\mathrm{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{2\left(-\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)c} \\
& - \frac{i\sqrt{2}\sqrt{\pi}b^2\,\mathrm{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{4\left(-\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)c} \\
& - \frac{\sqrt{\pi}a\,\mathrm{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{c\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)} \\
& - \frac{\sqrt{\pi}a\,\mathrm{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{c\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)} \\
& - \frac{i\sqrt{b\arcsin\left(cx\right)+a}e^{\left(i\arcsin(cx)\right)}}{2c} \\
& + \frac{i\sqrt{b\arcsin\left(cx\right)+a}e^{\left(-i\arcsin(cx)\right)}}{2c}\end{aligned}$$

```
[In] integrate((a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
[Out] 1/2*sqrt(2)*sqrt(pi)*a*b*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(ab
s(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b
```

```
^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c) + 1/4*I*sqrt(2)*sqrt(pi)*b^2*erf(-1/2*
I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(
c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*
c) + 1/2*sqrt(2)*sqrt(pi)*a*b*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqr
t(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/
((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c) - 1/4*I*sqrt(2)*sqrt(pi)*b^2*erf
(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*ar
csin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(ab
s(b)))*c) - sqrt(pi)*a*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(
b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(c*(I*s
qrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*a*erf(1/2*I*sqrt(
2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) +
a)*sqrt(abs(b))/b)*e^(-I*a/b)/(c*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(
abs(b)))) - 1/2*I*sqrt(b*arcsin(c*x) + a)*e^(I*arcsin(c*x))/c + 1/2*I*sqrt(
b*arcsin(c*x) + a)*e^(-I*arcsin(c*x))/c
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\arcsin(cx)}\,dx=\int \sqrt{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

```
[In] int((a + b*asin(c*x))^(1/2),x)
[Out] int((a + b*asin(c*x))^(1/2), x)
```

3.689 $\int \frac{\sqrt{a+b\arcsin(cx)}}{d+ex^2}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{d+ex^2}\,dx = \mathrm{Int}\left(\frac{\sqrt{a+b\arcsin(cx)}}{d+ex^2},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x)
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{d+ex^2}\,dx = \int \frac{\sqrt{a+b\arcsin(cx)}}{d+ex^2}\,dx$$

```
[In] Int[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2),x]
[Out] Defer[Int][Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2), x]
```

Rubi steps

$$\text{integral} = \int \frac{\sqrt{a+b\arcsin(cx)}}{d+ex^2}\,dx$$

Mathematica [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{d+ex^2}\,dx = \$\text{Aborted}$$

```
[In] Integrate[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2),x]
[Out] $Aborted
```

Maple [N/A] (verified)

Not integrable

Time = 1.12 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{\sqrt{a+b\arcsin\left(cx\right)}}{e\,x^2+d}dx$$

```
[In] int((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x)
[Out] int((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{d+ex^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 0.88 (sec) , antiderivative size = 19, normalized size of antiderivative = 0.86

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{d+ex^2}\,dx = \int \frac{\sqrt{a+b\operatorname{asin}\left(cx\right)}}{d+ex^2}\,dx$$

```
[In] integrate((a+b*asin(c*x))**(1/2)/(e*x**2+d),x)
[Out] Integral(sqrt(a + b*asin(c*x))/(d + e*x**2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{d+ex^2}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [N/A]

Not integrable

Time = 1.05 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{d+ex^2}\,dx = \int \frac{\sqrt{b\arcsin(cx)+a}}{ex^2+d}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*arcsin(c*x) + a)/(e*x^2 + d), x)
```

Mupad [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{d+ex^2}\,dx = \int \frac{\sqrt{a+b\,\mathrm{asin}\left(c\,x\right)}}{e\,x^2+d}\,dx$$

```
[In] int((a + b*asin(c*x))^(1/2)/(d + e*x^2),x)
```

```
[Out] int((a + b*asin(c*x))^(1/2)/(d + e*x^2), x)
```

3.690 $\int \frac{\sqrt{a+b\arcsin(cx)}}{(d+ex^2)^2}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{(d+ex^2)^2}\,dx = \text{Int}\left(\frac{\sqrt{a+b\arcsin(cx)}}{(d+ex^2)^2},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.03 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{(d+ex^2)^2}\,dx = \int \frac{\sqrt{a+b\arcsin(cx)}}{(d+ex^2)^2}\,dx$$

```
[In] Int[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2)^2,x]
```

```
[Out] Defer[Int][Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2)^2, x]
```

Rubi steps

$$\text{integral} = \int \frac{\sqrt{a+b\arcsin(cx)}}{(d+ex^2)^2}\,dx$$

Mathematica [F(-1)]

Timed out.

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{(d+ex^2)^2}\,dx=\$\text{Aborted}$$

```
[In] Integrate[Sqrt[a + b*ArcSin[c*x]]/(d + e*x^2)^2,x]
```

```
[Out] $Aborted
```

Maple [N/A] (verified)

Not integrable

Time = 1.23 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{\sqrt{a+b\arcsin\left(cx\right)}}{\left(e\,x^{2}+d\right)^{2}}dx$$

```
[In] int((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x)
```

```
[Out] int((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{(d+ex^2)^2}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 15.45 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{(d+ex^2)^2}\,dx=\int \frac{\sqrt{a+b\operatorname{asin}\left(cx\right)}}{\left(d+ex^2\right)^2}\,dx$$

```
[In] integrate((a+b*asin(c*x))**(1/2)/(e*x**2+d)**2,x)
```

```
[Out] Integral(sqrt(a + b*asin(c*x))/(d + e*x**2)**2, x)
```

Maxima [N/A]

Not integrable

Time = 0.63 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{(d+ex^2)^2}\,dx = \int \frac{\sqrt{b\arcsin{(cx)}+a}}{(ex^2+d)^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x, algorithm="maxima")
[Out] integrate(sqrt(b*arcsin(c*x) + a)/(e*x^2 + d)^2, x)
```

Giac [N/A]

Not integrable

Time = 1.28 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{(d+ex^2)^2}\,dx = \int \frac{\sqrt{b\arcsin{(cx)}+a}}{(ex^2+d)^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^(1/2)/(e*x^2+d)^2,x, algorithm="giac")
[Out] integrate(sqrt(b*arcsin(c*x) + a)/(e*x^2 + d)^2, x)
```

Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{a+b\arcsin(cx)}}{(d+ex^2)^2}\,dx = \int \frac{\sqrt{a+b\,\mathrm{asin}\left(c\,x\right)}}{{\left(e\,x^2+d\right)}^2}\,dx$$

```
[In] int((a + b*asin(c*x))^(1/2)/(d + e*x^2)^2,x)
[Out] int((a + b*asin(c*x))^(1/2)/(d + e*x^2)^2, x)
```

3.691 $\int (d+ex^2) (a+b\arcsin(cx))^{3/2} dx$

Optimal result

Integrand size = 20, antiderivative size = 482

$$\int (d+ex^2) (a+b\arcsin(cx))^{3/2} dx = \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c} + \frac{be\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{3c^3} + \frac{bex^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{6c} + dx(a+b\arcsin(cx))^{3/2} + \frac{1}{3}ex^3(a+b\arcsin(cx))^{3/2} - \frac{3b^{3/2}d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2c} - \frac{3b^{3/2}e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8c^3} + \frac{b^{3/2}e\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{24c^3} - \frac{3b^{3/2}d\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2c} - \frac{3b^{3/2}e\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{8c^3} + \frac{b^{3/2}e\sqrt{\frac{\pi}{6}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{24c^3}$$

```
[Out] d*x*(a+b*arcsin(c*x))^(3/2)+1/3*e*x^3*(a+b*arcsin(c*x))^(3/2)+1/144*b^(3/2)
*e*cos(3*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*6^
```

```
(1/2)*Pi^(1/2)/c^3+1/144*b^(3/2)*e*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*
x))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/c^3-3/4*b^(3/2)*d*cos(a/b)*F
resnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/
c-3/16*b^(3/2)*e*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)
/b^(1/2))*2^(1/2)*Pi^(1/2)/c^3-3/4*b^(3/2)*d*FresnelS(2^(1/2)/Pi^(1/2)*(a+b
*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/c-3/16*b^(3/2)*e*Fre
snelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi
^(1/2)/c^3+3/2*b*d*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^(1/2)/c+1/3*b*e*(-c
^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^(1/2)/c^3+1/6*b*e*x^2*(-c^2*x^2+1)^(1/2)*
(a+b*arcsin(c*x))^(1/2)/c
```

Rubi [A] (verified)

Time = 0.83 (sec) , antiderivative size = 482, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.650, Rules used = {4757, 4715, 4767, 4719, 3387, 3386, 3432, 3385, 3433, 4725, 4795, 4731, 4491}

$$\int (d+ex^2)(a+b\arcsin(cx))^{3/2}\,dx = -\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}e\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8c^3} + \frac{\sqrt{\frac{\pi}{6}}b^{3/2}e\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{24c^3} - \frac{3\sqrt{\frac{\pi}{2}}b^{3/2}e\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8c^3} + \frac{\sqrt{\frac{\pi}{6}}b^{3/2}e\sin\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{24c^3} - \frac{3\sqrt{\frac{\pi}{2}}b^{3/2}d\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2c} - \frac{3\sqrt{\frac{\pi}{2}}b^{3/2}d\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2c} + \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c} + \frac{bex^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{6c} + \frac{be\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{3c^3} + dx(a+b\arcsin(cx))^{3/2} + \frac{1}{3}ex^3(a+b\arcsin(cx))^{3/2}$$

[In] Int[(d + e*x^2)*(a + b*ArcSin[c*x])^(3/2),x]

[Out] (3*b*d*Sqrt[1 - c^2*x^2]*Sqrt[a + b*ArcSin[c*x]])/(2*c) + (b*e*Sqrt[1 - c^2*x^2]*Sqrt[a + b*ArcSin[c*x]])/(3*c^3) + (b*e*x^2*Sqrt[1 - c^2*x^2]*Sqrt[a + b*ArcSin[c*x]])/(6*c) + d*x*(a + b*ArcSin[c*x])^(3/2) + (e*x^3*(a + b*ArcSin[c*x])^(3/2))/3 - (3*b^(3/2)*d*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*c) - (3*b^(3/2)*e*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(8*c^3) + (b^(3/2)*e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(24*c^3) - (3*b^(3/2)*d*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*c) - (3*b^(3/2)*e*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(8*c^3) + (b^(3/2)*e*Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(24*c^3)

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
```

]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4725

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Dist[b*c*(n/(m + 1)), Int[x^
(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rule 4795

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
```

```
b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Dist[f^2*((m - 1)/(c^2*(m + 2*p
 + 1))), Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + Di
st[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], Int[(f*x)
^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m,
1] && NeQ[m + 2*p + 1, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(d(a+b\arcsin(cx))^{3/2}+ex^2(a+b\arcsin(cx))^{3/2}\right)\,dx\\
&= d\int (a+b\arcsin(cx))^{3/2}\,dx+e\int x^2(a+b\arcsin(cx))^{3/2}\,dx\\
&= dx(a+b\arcsin(cx))^{3/2}+\frac{1}{3}ex^3(a+b\arcsin(cx))^{3/2}\\
&\quad -\frac{1}{2}(3bcd)\int \frac{x\sqrt{a+b\arcsin(cx)}}{\sqrt{1-c^2x^2}}\,dx-\frac{1}{2}(bce)\int \frac{x^3\sqrt{a+b\arcsin(cx)}}{\sqrt{1-c^2x^2}}\,dx\\
&= \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c}\\
&\quad +\frac{bex^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{6c}+dx(a+b\arcsin(cx))^{3/2}\\
&\quad +\frac{1}{3}ex^3(a+b\arcsin(cx))^{3/2}-\frac{1}{4}(3b^2d)\int \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx\\
&\quad -\frac{1}{12}(b^2e)\int \frac{x^2}{\sqrt{a+b\arcsin(cx)}}\,dx-\frac{(be)\int \frac{x\sqrt{a+b\arcsin(cx)}}{\sqrt{1-c^2x^2}}\,dx}{3c}\\
&= \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{3c^3}\\
&\quad +\frac{bex^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{6c}+dx(a+b\arcsin(cx))^{3/2}\\
&\quad +\frac{1}{3}ex^3(a+b\arcsin(cx))^{3/2}-\frac{(3bd)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{4c}\\
&\quad -\frac{(be)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{12c^3}-\frac{(b^2e)\int \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx}{6c^2}
\end{aligned}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c} + \frac{be\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{3c^3} + \frac{bex^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{6c} + dx(a+b\arcsin(cx))^{3/2} + \frac{1}{3}ex^3(a+b\arcsin(cx))^{3/2} - \frac{(be)\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}} + \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right) dx, x, a+b\arcsin(cx)\right)}{12c^3} - \frac{(be)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}} dx, x, a+b\arcsin(cx)\right)}{6c^3} - \frac{\left(3bd\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}} dx, x, a+b\arcsin(cx)\right)}{4c} - \frac{\left(3bd\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}} dx, x, a+b\arcsin(cx)\right)}{4c}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c} + \frac{be\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{3c^3} + \frac{bex^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{6c} + dx(a+b\arcsin(cx))^{3/2} + \frac{1}{3}ex^3(a+b\arcsin(cx))^{3/2} + \frac{(be)\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}} dx, x, a+b\arcsin(cx)\right)}{48c^3} - \frac{(be)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}} dx, x, a+b\arcsin(cx)\right)}{48c^3} - \frac{\left(3bd\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right) dx, x, \sqrt{a+b\arcsin(cx)}\right)}{2c} - \frac{\left(be\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}} dx, x, a+b\arcsin(cx)\right)}{6c^3} - \frac{\left(3bd\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right) dx, x, \sqrt{a+b\arcsin(cx)}\right)}{2c} - \frac{\left(be\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}} dx, x, a+b\arcsin(cx)\right)}{6c^3}$$

$$
\begin{aligned}
&= \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c}+\frac{be\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{3c^3} \\
&+ \frac{bex^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{6c}+dx(a+b\arcsin(cx))^{3/2} \\
&+ \frac{1}{3}ex^3(a+b\arcsin(cx))^{3/2}-\frac{3b^{3/2}d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2c} \\
&- \frac{3b^{3/2}d\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2c} \\
&- \frac{\left(be\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{48c^3} \\
&- \frac{\left(be\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{3c^3} \\
&+ \frac{\left(be\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{48c^3} \\
&- \frac{\left(be\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{48c^3} \\
&- \frac{\left(be\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{3c^3} \\
&+ \frac{\left(be\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{48c^3}
\end{aligned}
$$

$$= \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c} + \frac{be\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{3c^3} + \frac{bex^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{6c} + dx(a+b\arcsin(cx))^{3/2} + \frac{1}{3}ex^3(a+b\arcsin(cx))^{3/2} - \frac{3b^{3/2}d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2c} - \frac{b^{3/2}e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{3c^3} - \frac{3b^{3/2}d\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2c} - \frac{b^{3/2}e\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3c^3} - \frac{\left(be\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{24c^3} + \frac{\left(be\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{24c^3} - \frac{\left(be\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{24c^3} + \frac{\left(be\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{24c^3}$$

$$= \frac{3bd\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c} + \frac{be\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{3c^3} + \frac{bex^2\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{6c} + dx(a+b\arcsin(cx))^{3/2} + \frac{1}{3}ex^3(a+b\arcsin(cx))^{3/2} - \frac{3b^{3/2}d\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2c} - \frac{3b^{3/2}e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8c^3} + \frac{b^{3/2}e\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{24c^3} - \frac{3b^{3/2}d\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2c} - \frac{3b^{3/2}e\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{8c^3} + \frac{b^{3/2}e\sqrt{\frac{\pi}{6}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{24c^3}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 8.61 (sec) , antiderivative size = 844, normalized size of antiderivative = 1.75

$$\int (d+ex^2)(a+b\arcsin(cx))^{3/2}\,dx = \frac{abde^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(cx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin}{b}\right.\right.}{2c\sqrt{a+b\arcsin(cx)}} + \frac{abee^{-\frac{3ia}{b}}\left(9e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(cx))}{b}\right)+9e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(cx))}{b}\right)-\sqrt{3}\left(\right.\right.}{72c^3\sqrt{a+b\arcsin(cx}} + \frac{\sqrt{b}d\left(2\sqrt{b}\sqrt{a+b\arcsin(cx)}\left(3\sqrt{1-c^2x^2}+2cx\arcsin(cx)\right)-\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\left(3b\cos\left(\frac{a}{b}\right.\right.\right.}{4c} + \frac{\sqrt{b}e\left(18\sqrt{b}\sqrt{a+b\arcsin(cx)}\left(3\sqrt{1-c^2x^2}+2cx\arcsin(cx)\right)-9\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\left(3b\cos\right.\right.}{}$$

```
[In] Integrate[(d + e*x^2)*(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (a*b*d*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c
*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, (I*(a
 + b*ArcSin[c*x]))/b]))/(2*c*E^((I*a)/b)*Sqrt[a + b*ArcSin[c*x]]) + (a*b*e*
(9*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-I)*(a +
 b*ArcSin[c*x]))/b] + 9*E^(((4*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gam
ma[3/2, (I*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*(Sqrt[((-I)*(a + b*ArcSin[c*x]
))/b]*Gamma[3/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] + E^(((6*I)*a)/b)*Sqrt[(I*
(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((3*I)*(a + b*ArcSin[c*x]))/b])))/(72*c^
3*E^(((3*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]]) + (Sqrt[b]*d*(2*Sqrt[b]*Sqrt[a +
 b*ArcSin[c*x]]*(3*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x]) - Sqrt[2*Pi]*Fres
nelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*(3*b*Cos[a/b] + 2*a*Sin[
a/b]) + Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*(
2*a*Cos[a/b] - 3*b*Sin[a/b])))/(4*c) + (Sqrt[b]*e*(18*Sqrt[b]*Sqrt[a + b*Ar
cSin[c*x]]*(3*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x]) - 9*Sqrt[2*Pi]*Fresnel
C[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*(3*b*Cos[a/b] + 2*a*Sin[a/b
]) + 9*Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*(2
*a*Cos[a/b] - 3*b*Sin[a/b]) + Sqrt[6*Pi]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*Ar
cSin[c*x]])/Sqrt[b]]*(b*Cos[(3*a)/b] + 2*a*Sin[(3*a)/b]) - Sqrt[6*Pi]*Fresn
elS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*(2*a*Cos[(3*a)/b] - b*Sin
[(3*a)/b]) - 6*Sqrt[b]*Sqrt[a + b*ArcSin[c*x]]*(Cos[3*ArcSin[c*x]] + 2*ArcS
in[c*x]*Sin[3*ArcSin[c*x]])))/(144*c^3)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 849 vs. 2(374) = 748.

Time = 0.42 (sec) , antiderivative size = 850, normalized size of antiderivative = 1.76

method	result	size
default	Expression too large to display	850

```
[In] int((e*x^2+d)*(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/144/c^3*(-108*(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*Pi^(1/2)*cos(a/b)*Fres
nelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*2^(1/2)*b^2*c
^2*d+108*(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*Pi^(1/2)*sin(a/b)*FresnelS(2^
(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*2^(1/2)*b^2*c^2*d+(-
3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)*Pi^(1/2)*cos(3*a/b)*FresnelC(3*2^(1/2)/P
i^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*2^(1/2)*b^2*e-(-3/b)^(1/2)*
(a+b*arcsin(c*x))^(1/2)*Pi^(1/2)*sin(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3
/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*2^(1/2)*b^2*e-27*(-1/b)^(1/2)*(a+b*arc
sin(c*x))^(1/2)*Pi^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a
+b*arcsin(c*x))^(1/2)/b)*2^(1/2)*b^2*e+27*(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1
/2)*Pi^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*
```

```
x))^(1/2)/b)*2^(1/2)*b^2*e-144*arcsin(c*x)^2*sin(-(a+b*arcsin(c*x))/b+a/b)*
b^2*c^2*d-288*arcsin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*a*b*c^2*d+216*arcsi
n(c*x)*cos(-(a+b*arcsin(c*x))/b+a/b)*b^2*c^2*d+12*arcsin(c*x)^2*sin(-3*(a+b
*arcsin(c*x))/b+3*a/b)*b^2*e-36*arcsin(c*x)^2*sin(-(a+b*arcsin(c*x))/b+a/b)
*b^2*e-144*sin(-(a+b*arcsin(c*x))/b+a/b)*a^2*c^2*d+216*cos(-(a+b*arcsin(c*x
))/b+a/b)*a*b*c^2*d+24*arcsin(c*x)*sin(-3*(a+b*arcsin(c*x))/b+3*a/b)*a*b*e-
6*arcsin(c*x)*cos(-3*(a+b*arcsin(c*x))/b+3*a/b)*b^2*e-72*arcsin(c*x)*sin(-(
a+b*arcsin(c*x))/b+a/b)*a*b*e+54*arcsin(c*x)*cos(-(a+b*arcsin(c*x))/b+a/b)*
b^2*e+12*sin(-3*(a+b*arcsin(c*x))/b+3*a/b)*a^2*e-6*cos(-3*(a+b*arcsin(c*x))
/b+3*a/b)*a*b*e-36*sin(-(a+b*arcsin(c*x))/b+a/b)*a^2*e+54*cos(-(a+b*arcsin(
c*x))/b+a/b)*a*b*e)/(a+b*arcsin(c*x))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int (d+ex^2) (a+b\arcsin(cx))^{3/2} \, dx = \text{Exception raised: TypeError}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int (d+ex^2) (a+b\arcsin(cx))^{3/2} \, dx = \int (a+b\operatorname{asin}(cx))^{\frac{3}{2}} (d+ex^2) \, dx$$

```
[In] integrate((e*x**2+d)*(a+b*asin(c*x))**(3/2),x)
[Out] Integral((a + b*asin(c*x))**(3/2)*(d + e*x**2), x)
```

Maxima [F]

$$\int (d+ex^2) (a+b\arcsin(cx))^{3/2} \, dx = \int (ex^2+d)(b\arcsin(cx)+a)^{\frac{3}{2}} \, dx$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
[Out] integrate((e*x^2 + d)*(b*arcsin(c*x) + a)^(3/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 2.04 (sec) , antiderivative size = 2814, normalized size of antiderivative = 5.84

$$\int (d+ex^2)\,(a+b\arcsin(cx))^{3/2}\,dx = \text{Too large to display}$$

```
[In] integrate((e*x^2+d)*(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] 1/96*(48*sqrt(2)*sqrt(pi)*a^2*b*c^2*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x)
 + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^
(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 48*I*sqrt(2)*sqrt(pi)*a*b^2
*c^2*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2
)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b
*sqrt(abs(b))) + 48*sqrt(2)*sqrt(pi)*a^2*b*c^2*d*erf(1/2*I*sqrt(2)*sqrt(b*a
rcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs
(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) - 48*I*sqrt(2)*sq
rt(pi)*a*b^2*c^2*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) -
 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqr
t(abs(b)) + b*sqrt(abs(b))) - 48*I*sqrt(2)*sqrt(pi)*a*b*c^2*d*erf(-1/2*I*sq
rt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x)
 + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) + 36*sqrt
(2)*sqrt(pi)*b^2*c^2*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(
b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sq
rt(abs(b)) + sqrt(abs(b))) + 48*I*sqrt(2)*sqrt(pi)*a*b*c^2*d*erf(1/2*I*sqrt
(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) +
 a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) + 36*sqrt
(2)*sqrt(pi)*b^2*c^2*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b
)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/s
qrt(abs(b)) + sqrt(abs(b))) - 48*I*sqrt(b*arcsin(c*x) + a)*b*c^2*d*arcsin(c
*x)*e^(I*arcsin(c*x)) + 48*I*sqrt(b*arcsin(c*x) + a)*b*c^2*d*arcsin(c*x)*e^
(-I*arcsin(c*x)) - 96*sqrt(pi)*a^2*c^2*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c
*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)
*e^(I*a/b)/(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) - 96*sqrt(pi)*
a^2*c^2*d*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt
(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*sqrt(2)*b/sqrt(a
bs(b)) + sqrt(2)*sqrt(abs(b))) + 12*sqrt(2)*sqrt(pi)*a^2*b*e*erf(-1/2*I*sqr
t(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x)
+ a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 12*I
*sqrt(2)*sqrt(pi)*a*b^2*e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(a
bs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b
^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 12*sqrt(2)*sqrt(pi)*a^2*b*e*erf(1/2*I*s
qrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x
) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) -
```

12*I*sqrt(2)*sqrt(pi)*a*b^2*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) - 48*I*sqrt(b*arcsin(c*x) + a)*a*c^2*d*e^(I*arcsin(c*x)) + 72*sqrt(b*arcsin(c*x) + a)*b*c^2*d*e^(I*arcsin(c*x)) + 48*I*sqrt(b*arcsin(c*x) + a)*a*c^2*d*e^(-I*arcsin(c*x)) + 72*sqrt(b*arcsin(c*x) + a)*b*c^2*d*e^(-I*arcsin(c*x)) - 24*sqrt(pi)*a^2*sqrt(b)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*b + I*sqrt(6)*b^2/abs(b)) - 8*I*sqrt(pi)*a*b^(3/2)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*b + I*sqrt(6)*b^2/abs(b)) - 12*I*sqrt(2)*sqrt(pi)*a*b*e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) + 9*sqrt(2)*sqrt(pi)*b^2*e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) + 12*I*sqrt(2)*sqrt(pi)*a*b*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) + 9*sqrt(2)*sqrt(pi)*b^2*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b/sqrt(abs(b)) + sqrt(abs(b))) - 24*sqrt(pi)*a^2*sqrt(b)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*b - I*sqrt(6)*b^2/abs(b)) + 8*I*sqrt(pi)*a*b^(3/2)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*b - I*sqrt(6)*b^2/abs(b)) + 4*I*sqrt(b*arcsin(c*x) + a)*b*e*arcsin(c*x)*e^(3*I*arcsin(c*x)) - 12*I*sqrt(b*arcsin(c*x) + a)*b*e*arcsin(c*x)*e^(I*arcsin(c*x)) + 12*I*sqrt(b*arcsin(c*x) + a)*b*e*arcsin(c*x)*e^(-I*arcsin(c*x)) - 4*I*sqrt(b*arcsin(c*x) + a)*b*e*arcsin(c*x)*e^(-3*I*arcsin(c*x)) + 24*sqrt(pi)*a^2*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(b)) + 8*I*sqrt(pi)*a*b*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(b)) - 24*sqrt(pi)*a^2*e*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) - 24*sqrt(pi)*a^2*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))) + 24*sqrt(pi)*a^2*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs(b)) - 8*I*sqrt(pi)*a*b*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs(b)) - 2*sqrt(pi)*b^(3/2)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(

```
3*I*a/b)/(sqrt(6) + I*sqrt(6)*b/abs(b)) - 2*sqrt(pi)*b^(3/2)*e*erf(-1/2*sqr
t(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a
)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(6) - I*sqrt(6)*b/abs(b)) + 4*I*sqrt(b*
arcsin(c*x) + a)*a*e*e^(3*I*arcsin(c*x)) - 2*sqrt(b*arcsin(c*x) + a)*b*e*e^
(3*I*arcsin(c*x)) - 12*I*sqrt(b*arcsin(c*x) + a)*a*e*e^(I*arcsin(c*x)) + 18
*sqrt(b*arcsin(c*x) + a)*b*e*e^(I*arcsin(c*x)) + 12*I*sqrt(b*arcsin(c*x) +
a)*a*e*e^(-I*arcsin(c*x)) + 18*sqrt(b*arcsin(c*x) + a)*b*e*e^(-I*arcsin(c*x
)) - 4*I*sqrt(b*arcsin(c*x) + a)*a*e*e^(-3*I*arcsin(c*x)) - 2*sqrt(b*arcsin
(c*x) + a)*b*e*e^(-3*I*arcsin(c*x)))/c^3
```

Mupad [F(-1)]

Timed out.

$$\int \left(d+ex^2\right)(a+b\arcsin(cx))^{3/2}\,dx=\int {\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^{3/2}\,\left(e\,x^2+d\right)\,dx$$

```
[In] int((a + b*asin(c*x))^(3/2)*(d + e*x^2),x)
[Out] int((a + b*asin(c*x))^(3/2)*(d + e*x^2), x)
```

3.692 $\int (a+b\arcsin(cx))^{3/2}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 159

$$\int (a+b\arcsin(cx))^{3/2}\,dx=\frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c}+x(a+b\arcsin(cx))^{3/2}-\frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2c}-\frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2c}$$

```
[Out] x*(a+b*arcsin(c*x))^(3/2)-3/4*b^(3/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a
+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/c-3/4*b^(3/2)*FresnelS(2^(1
/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/c+3
/2*b*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^(1/2)/c
```

Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4715, 4767, 4719, 3387, 3386, 3432, 3385, 3433}

$$\int (a+b\arcsin(cx))^{3/2}\,dx=-\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2c}-\frac{3\sqrt{\frac{\pi}{2}}b^{3/2}\sin\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2c}+\frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c}+x(a+b\arcsin(cx))^{3/2}$$

```
[In] Int[(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (3*b*Sqrt[1 - c^2*x^2]*Sqrt[a + b*ArcSin[c*x]])/(2*c) + x*(a + b*ArcSin[c*x
])^(3/2) - (3*b^(3/2)*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*A
rcSin[c*x]])/Sqrt[b]])/(2*c) - (3*b^(3/2)*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*S
qrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*c)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4715

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Dist[b*c*n, Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4767

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Dist[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p], In
t[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Rubi steps

$$\text{integral} = x(a+b\arcsin(cx))^{3/2} - \frac{1}{2}(3bc)\int \frac{x\sqrt{a+b\arcsin(cx)}}{\sqrt{1-c^2x^2}}\,dx$$

$$= \frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c} + x(a+b\arcsin(cx))^{3/2} - \frac{1}{4}(3b^2)\int \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx$$

$$= \frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c} + x(a+b\arcsin(cx))^{3/2} - \frac{(3b)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4c}$$

$$= \frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c} + x(a+b\arcsin(cx))^{3/2} - \frac{\left(3b\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4c} - \frac{\left(3b\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{4c}$$

$$= \frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c} + x(a+b\arcsin(cx))^{3/2} - \frac{\left(3b\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{2c} - \frac{\left(3b\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{2c}$$

$$= \frac{3b\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}{2c} + x(a+b\arcsin(cx))^{3/2} - \frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2c} - \frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2c}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.49 (sec) , antiderivative size = 289, normalized size of antiderivative = 1.82

$$\int (a+b\arcsin(cx))^{3/2}\,dx = \frac{abe^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(cx))}{b}}\,\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(cx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(cx))}{b}}\,\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(cx}{b}\right.\right.}{2c\sqrt{a+b\arcsin(cx)}} + \frac{\sqrt{b}\left(2\sqrt{b}\sqrt{a+b\arcsin(cx)}\left(3\sqrt{1-c^2x^2}+2cx\arcsin(cx)\right)-\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\left(3b\cos\left(\frac{a}{b}\right)\right.\right.}{4c}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (a*b*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c*x
]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[3/2, (I*(a +
 b*ArcSin[c*x]))/b]))/(2*c*E^((I*a)/b)*Sqrt[a + b*ArcSin[c*x]]) + (Sqrt[b]*
(2*Sqrt[b]*Sqrt[a + b*ArcSin[c*x]]*(3*Sqrt[1 - c^2*x^2] + 2*c*x*ArcSin[c*x]
) - Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*(3*b*
Cos[a/b] + 2*a*Sin[a/b]) + Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSi
n[c*x]])/Sqrt[b]]*(2*a*Cos[a/b] - 3*b*Sin[a/b])))/(4*c)
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 277 vs. 2(123) = 246.

Time = 0.16 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.75

method	result
default	$-\frac{3\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(cx)}\,\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,b^2-3\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(cx)}\,\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcs}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}}\right.}{}$

```
[In] int((a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/c*(3*Pi^(1/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*FresnelC(2^(1/2
)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*b^2-3*Pi^(1
/2)*2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/
b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*b^2+4*arcsin(c*x)^2*sin(-(
a+b*arcsin(c*x))/b+a/b)*b^2+8*arcsin(c*x)*sin(-(a+b*arcsin(c*x))/b+a/b)*a*b
-6*arcsin(c*x)*cos(-(a+b*arcsin(c*x))/b+a/b)*b^2+4*sin(-(a+b*arcsin(c*x))/b
+a/b)*a^2-6*cos(-(a+b*arcsin(c*x))/b+a/b)*a*b)/(a+b*arcsin(c*x))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int (a+b\arcsin(cx))^{3/2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int (a+b\arcsin(cx))^{3/2}\,dx = \int (a+b\,\mathrm{asin}\,(cx))^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*asin(c*x))**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**(3/2), x)
```

Maxima [F]

$$\int (a+b\arcsin(cx))^{3/2}\,dx = \int (b\arcsin(cx)+a)^{\frac{3}{2}}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arcsin(c*x) + a)^(3/2), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.14 (sec) , antiderivative size = 993, normalized size of antiderivative = 6.25

$$\int (a+b\arcsin(cx))^{3/2}\,dx = \text{Too large to display}$$

```
[In] integrate((a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(2)*sqrt(pi)*a^2*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqr
t(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(
(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c) + 1/2*I*sqrt(2)*sqrt(pi)*a*b^3*e
```

```
rf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b
*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt
(abs(b)))*c) + 1/2*sqrt(2)*sqrt(pi)*a^2*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin
(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/
b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*c) - 1/2*I*sqrt(2)*
sqrt(pi)*a*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2
*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(a
bs(b)) + b^2*sqrt(abs(b)))*c) - 1/2*I*sqrt(2)*sqrt(pi)*a*b^2*erf(-1/2*I*sqr
t(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x)
+ a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c) +
3/8*sqrt(2)*sqrt(pi)*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(ab
s(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b
^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c) + 1/2*I*sqrt(2)*sqrt(pi)*a*b^2*erf(1/2
*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin
(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)
))*c) + 3/8*sqrt(2)*sqrt(pi)*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/
sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/
b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*c) - sqrt(pi)*a^2*b*erf(-1/2*I*s
qrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x
) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*s
qrt(abs(b)))*c) - sqrt(pi)*a^2*b*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/
sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/
b)/((-I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*c) - 1/2*I*sqrt(
b*arcsin(c*x) + a)*b*arcsin(c*x)*e^(I*arcsin(c*x))/c + 1/2*I*sqrt(b*arcsin(
c*x) + a)*b*arcsin(c*x)*e^(-I*arcsin(c*x))/c - 1/2*I*sqrt(b*arcsin(c*x) + a
)*a*e^(I*arcsin(c*x))/c + 3/4*sqrt(b*arcsin(c*x) + a)*b*e^(I*arcsin(c*x))/c
 + 1/2*I*sqrt(b*arcsin(c*x) + a)*a*e^(-I*arcsin(c*x))/c + 3/4*sqrt(b*arcsin
(c*x) + a)*b*e^(-I*arcsin(c*x))/c
```

Mupad [F(-1)]

Timed out.

$$\int (a+b\arcsin(cx))^{3/2}\,dx=\int \left(a+b\,\mathrm{asin}(c\,x)\right)^{3/2}\,dx$$

```
[In] int((a + b*asin(c*x))^(3/2),x)
[Out] int((a + b*asin(c*x))^(3/2), x)
```

3.693 $\int \frac{(a+b\arcsin(cx))^{3/2}}{d+ex^2}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{d+ex^2}\,dx=\text{Int}\left(\frac{(a+b\arcsin(cx))^{3/2}}{d+ex^2},x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x)
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{d+ex^2}\,dx=\int \frac{(a+b\arcsin(cx))^{3/2}}{d+ex^2}\,dx$$

```
[In] Int[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2),x]
```

```
[Out] Defer[Int][(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2), x]
```

Rubi steps

$$\text{integral}=\int \frac{(a+b\arcsin(cx))^{3/2}}{d+ex^2}\,dx$$

Mathematica [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{d+ex^2}\,dx=\$\text{Aborted}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2),x]
[Out] $Aborted
```

Maple [N/A] (verified)

Not integrable

Time = 1.01 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{(a+b\arcsin(cx))^{\frac{3}{2}}}{e\,x^2+d}dx$$

```
[In] int((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x)
[Out] int((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{d+ex^2}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 10.83 (sec) , antiderivative size = 19, normalized size of antiderivative = 0.86

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{d+ex^2}\,dx=\int \frac{(a+b\,\mathrm{asin}\,(cx))^{\frac{3}{2}}}{d+ex^2}\,dx$$

```
[In] integrate((a+b*asin(c*x))**(3/2)/(e*x**2+d),x)
[Out] Integral((a + b*asin(c*x))**(3/2)/(d + e*x**2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{d+ex^2}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagin
ary; found %i
```

Giac [N/A]

Not integrable

Time = 1.07 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{d+ex^2}\,dx = \int \frac{(b\arcsin(cx)+a)^{\frac{3}{2}}}{ex^2+d}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*arcsin(c*x) + a)^(3/2)/(e*x^2 + d), x)
```

Mupad [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{d+ex^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^{3/2}}{e\,x^2+d}\,dx$$

```
[In] int((a + b*asin(c*x))^(3/2)/(d + e*x^2),x)
```

```
[Out] int((a + b*asin(c*x))^(3/2)/(d + e*x^2), x)
```

3.694 $\int \frac{(a+b\arcsin(cx))^{3/2}}{(d+ex^2)^2} dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{(d+ex^2)^2} dx = \mathrm{Int}\left(\frac{(a+b\arcsin(cx))^{3/2}}{(d+ex^2)^2}, x\right)$$

```
[Out] Unintegrable((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x)
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{(d+ex^2)^2} dx = \int \frac{(a+b\arcsin(cx))^{3/2}}{(d+ex^2)^2} dx$$

```
[In] Int[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2)^2,x]
```

```
[Out] Defer[Int][(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2)^2, x]
```

Rubi steps

$$\text{integral} = \int \frac{(a+b\arcsin(cx))^{3/2}}{(d+ex^2)^2} dx$$

Mathematica [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{(d+ex^2)^2}\,dx = \$\text{Aborted}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^(3/2)/(d + e*x^2)^2,x]
[Out] $Aborted
```

Maple [N/A] (verified)

Not integrable

Time = 1.26 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{(a+b\arcsin(cx))^{\frac{3}{2}}}{(e\,x^2+d)^2}dx$$

```
[In] int((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x)
[Out] int((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{(d+ex^2)^2}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 106.55 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{(d+ex^2)^2}\,dx = \int \frac{(a+b\,\text{asin}\,(cx))^{\frac{3}{2}}}{(d+ex^2)^2}\,dx$$

```
[In] integrate((a+b*asin(c*x))**(3/2)/(e*x**2+d)**2,x)
[Out] Integral((a + b*asin(c*x))**(3/2)/(d + e*x**2)**2, x)
```

Maxima [N/A]

Not integrable

Time = 0.74 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{(d+ex^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)^{\frac{3}{2}}}{(ex^2+d)^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x, algorithm="maxima")
[Out] integrate((b*arcsin(c*x) + a)^(3/2)/(e*x^2 + d)^2, x)
```

Giac [N/A]

Not integrable

Time = 1.35 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{(d+ex^2)^2}\,dx = \int \frac{(b\arcsin(cx)+a)^{\frac{3}{2}}}{(ex^2+d)^2}\,dx$$

```
[In] integrate((a+b*arcsin(c*x))^(3/2)/(e*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^(3/2)/(e*x^2 + d)^2, x)
```

Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^{3/2}}{(d+ex^2)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^{3/2}}{(e\,x^2+d)^2}\,dx$$

```
[In] int((a + b*asin(c*x))^(3/2)/(d + e*x^2)^2,x)
[Out] int((a + b*asin(c*x))^(3/2)/(d + e*x^2)^2, x)
```

3.695 $\int \frac{(d+ex^2)^2}{\sqrt{a+b\arcsin(cx)}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 679

$$\int \frac{(d+ex^2)^2}{\sqrt{a+b\arcsin(cx)}}\,dx = \frac{de\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c^3} + \frac{e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4\sqrt{b}c^5} + \frac{d^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c} - \frac{de\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c^3} - \frac{e^2\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8\sqrt{b}c^5} + \frac{e^2\sqrt{\frac{\pi}{10}}\cos\left(\frac{5a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8\sqrt{b}c^5} + \frac{de\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c^3} + \frac{e^2\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4\sqrt{b}c^5} + \frac{d^2\sqrt{2\pi}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c} - \frac{de\sqrt{\frac{\pi}{6}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{\sqrt{b}c^3} - \frac{e^2\sqrt{\frac{3\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{8\sqrt{b}c^5} + \frac{e^2\sqrt{\frac{\pi}{10}}\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{8\sqrt{b}c^5}$$

```
[Out] 1/80*e^2*cos(5*a/b)*FresnelC(10^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1
/2))*10^(1/2)*Pi^(1/2)/c^5/b^(1/2)+1/80*e^2*FresnelS(10^(1/2)/Pi^(1/2)*(a+b
*arcsin(c*x))^(1/2)/b^(1/2))*sin(5*a/b)*10^(1/2)*Pi^(1/2)/c^5/b^(1/2)-1/6*d
*e*cos(3*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*6^
(1/2)*Pi^(1/2)/c^3/b^(1/2)-1/6*d*e*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*
x))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/c^3/b^(1/2)+1/2*d*e*cos(a/b)
*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2
)/c^3/b^(1/2)+1/8*e^2*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^
(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/c^5/b^(1/2)+1/2*d*e*FresnelS(2^(1/2)/Pi^(1/
2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/c^3/b^(1/2)+1
/8*e^2*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*
2^(1/2)*Pi^(1/2)/c^5/b^(1/2)-1/16*e^2*cos(3*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*
(a+b*arcsin(c*x))^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/2)/c^5/b^(1/2)-1/16*e^2*Fres
nelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*P
i^(1/2)/c^5/b^(1/2)+d^2*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x)
)^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/c/b^(1/2)+d^2*FresnelS(2^(1/2)/Pi^(1/2)*(
a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/c/b^(1/2)
```

Rubi [A] (verified)

Time = 0.83 (sec) , antiderivative size = 679, normalized size of antiderivative = 1.00, number of steps used = 39, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.409$, Rules used

= {4757, 4719, 3387, 3386, 3432, 3385, 3433, 4731, 4491}

$$\int \frac{(d+ex^2)^2}{\sqrt{a+b\arcsin(cx)}}\,dx = \frac{\sqrt{\frac{\pi}{2}}e^2\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4\sqrt{b}c^5} - \frac{\sqrt{\frac{3\pi}{2}}e^2\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8\sqrt{b}c^5} + \frac{\sqrt{\frac{\pi}{10}}e^2\cos\left(\frac{5a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8\sqrt{b}c^5} + \frac{\sqrt{\frac{\pi}{2}}e^2\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4\sqrt{b}c^5} - \frac{\sqrt{\frac{3\pi}{2}}e^2\sin\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8\sqrt{b}c^5} + \frac{\sqrt{\frac{\pi}{10}}e^2\sin\left(\frac{5a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8\sqrt{b}c^5} + \frac{\sqrt{\frac{\pi}{2}}de\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c^3} - \frac{\sqrt{\frac{\pi}{6}}de\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c^3} + \frac{\sqrt{\frac{\pi}{2}}de\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c^3} - \frac{\sqrt{\frac{\pi}{6}}de\sin\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c^3} + \frac{\sqrt{2\pi}d^2\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c} + \frac{\sqrt{2\pi}d^2\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c}$$

```
[In] Int[(d + e*x^2)^2/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (d*e*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt
[b]])/(Sqrt[b]*c^3) + (e^2*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a
+ b*ArcSin[c*x]])/Sqrt[b]])/(4*Sqrt[b]*c^5) + (d^2*Sqrt[2*Pi]*Cos[a/b]*Fres
nelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(Sqrt[b]*c) - (d*e*Sqrt
[Pi/6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])
/(Sqrt[b]*c^3) - (e^2*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqrt
[a + b*ArcSin[c*x]])/Sqrt[b]])/(8*Sqrt[b]*c^5) + (e^2*Sqrt[Pi/10]*Cos[(5*a)
/b]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(8*Sqrt[b]*c^5
) + (d*e*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*
Sin[a/b])/(Sqrt[b]*c^3) + (e^2*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*A
rcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(4*Sqrt[b]*c^5) + (d^2*Sqrt[2*Pi]*FresnelS[
(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(Sqrt[b]*c) - (d*e*
Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)
/b])/(Sqrt[b]*c^3) - (e^2*Sqrt[(3*Pi)/2]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*Ar
cSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(8*Sqrt[b]*c^5) + (e^2*Sqrt[Pi/10]*Fresn
elS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[(5*a)/b])/(8*Sqrt[b]
*c^5)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rubi steps

$$\text{integral} = \int \left(\frac{d^2}{\sqrt{a+b\arcsin(cx)}}+\frac{2dex^2}{\sqrt{a+b\arcsin(cx)}}+\frac{e^2x^4}{\sqrt{a+b\arcsin(cx)}}\right)dx$$

$$=d^2\int \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx+(2de)\int \frac{x^2}{\sqrt{a+b\arcsin(cx)}}\,dx+e^2\int \frac{x^4}{\sqrt{a+b\arcsin(cx)}}\,dx$$

$$=\frac{d^2\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{bc}+\frac{(2de)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{bc^3}+\frac{e^2\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^4\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{bc^5}$$

$$= \frac{(2de)\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right)dx,x,a+b\arcsin(cx)\right)}{bc^3}$$
$$+\frac{e^2\text{Subst}\left(\int \left(\frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{16\sqrt{x}}-\frac{3\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{16\sqrt{x}}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{8\sqrt{x}}\right)dx,x,a+b\arcsin(cx)\right)}{bc^5}$$
$$+\frac{\left(d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{bc}$$
$$+\frac{\left(d^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{bc}$$

$$= -\frac{(de)\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{2bc^3}$$
$$+\frac{(de)\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{2bc^3}$$
$$+\frac{e^2\text{Subst}\left(\int \frac{\cos\left(\frac{5a}{b}-\frac{5x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{16bc^5}$$
$$+\frac{e^2\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{8bc^5}$$
$$-\frac{(3e^2)\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}dx,x,a+b\arcsin(cx)\right)}{16bc^5}$$
$$+\frac{\left(2d^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(cx)}\right)}{bc}$$
$$+\frac{\left(2d^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(cx)}\right)}{bc}$$

$$= \frac{d^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c} + \frac{d^2\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c} + \frac{\left(de\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2bc^3} + \frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{8bc^5} - \frac{\left(de\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2bc^3} - \frac{\left(3e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{16bc^5} + \frac{\left(e^2\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{5x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{16bc^5} + \frac{\left(de\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2bc^3} + \frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{8bc^5} - \frac{\left(de\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2bc^3} - \frac{\left(3e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{16bc^5} + \frac{\left(e^2\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{5x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{16bc^5}$$

$$
= \frac{d^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c}
+ \frac{d^2\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c}
+ \frac{\left(de\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(cx)}\right)}{bc^3}
+ \frac{\left(e^2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(cx)}\right)}{4bc^5}
- \frac{\left(de\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(cx)}\right)}{bc^3}
- \frac{\left(3e^2\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(cx)}\right)}{8bc^5}
+ \frac{\left(e^2\cos\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{5x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(cx)}\right)}{8bc^5}
+ \frac{\left(de\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(cx)}\right)}{bc^3}
+ \frac{\left(e^2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(cx)}\right)}{4bc^5}
- \frac{\left(de\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(cx)}\right)}{bc^3}
- \frac{\left(3e^2\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(cx)}\right)}{8bc^5}
+ \frac{\left(e^2\sin\left(\frac{5a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{5x^2}{b}\right)dx, x, \sqrt{a+b\arcsin(cx)}\right)}{8bc^5}
$$

$$
\begin{aligned}
&= \frac{de\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c^3} \\
&+ \frac{e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{4\sqrt{b}c^5} \\
&+ \frac{d^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c} \\
&- \frac{de\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c^3} \\
&- \frac{e^2\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8\sqrt{b}c^5} \\
&+ \frac{e^2\sqrt{\frac{\pi}{10}}\cos\left(\frac{5a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{8\sqrt{b}c^5} \\
&+ \frac{de\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c^3} \\
&+ \frac{e^2\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4\sqrt{b}c^5} \\
&+ \frac{d^2\sqrt{2\pi}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c} \\
&- \frac{de\sqrt{\frac{\pi}{6}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{\sqrt{b}c^3} \\
&- \frac{e^2\sqrt{\frac{3\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{8\sqrt{b}c^5} \\
&+ \frac{e^2\sqrt{\frac{\pi}{10}}\text{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{8\sqrt{b}c^5}
\end{aligned}
$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.14 (sec) , antiderivative size = 401, normalized size of antiderivative = 0.59

$$\int \frac{(d+ex^2)^2}{\sqrt{a+b\arcsin(cx)}}\,dx$$
$$= \frac{ie^{-\frac{5ia}{b}}\left(-30(8c^4d^2+4c^2de+e^2)\,e^{\frac{4ia}{b}}\sqrt{-\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(cx))}{b}\right)+30(8c^4d^2+4c^2de+e^2)\,e^{\frac{6ia}{b}}\right.}{}$$

```
[In] Integrate[(d + e*x^2)^2/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] ((I/480)*(-30*(8*c^4*d^2 + 4*c^2*d*e + e^2)*E^(((4*I)*a)/b)*Sqrt[((-I)*(a +
 b*ArcSin[c*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] + 30*(8*c^4*d^
2 + 4*c^2*d*e + e^2)*E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[
1/2, (I*(a + b*ArcSin[c*x]))/b] + e*(5*Sqrt[3]*(8*c^2*d + 3*e)*E^(((2*I)*a)
/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c*x
]))/b] - 5*Sqrt[3]*(8*c^2*d + 3*e)*E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*
x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c*x]))/b] - 3*Sqrt[5]*e*(Sqrt[((-I)
*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c*x]))/b] - E^(((
10*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((5*I)*(a + b*ArcSin
[c*x]))/b]))))/(c^5*E^(((5*I)*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] (verified)

Time = 0.50 (sec) , antiderivative size = 664, normalized size of antiderivative = 0.98

method	result
default	$\frac{\sqrt{\pi}\sqrt{2}\sqrt{-\frac{5}{b}}\left(-48\sqrt{-\frac{1}{b}}\sqrt{-\frac{5}{b}}\cos\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)b\,c^4d^2+48\sqrt{-\frac{1}{b}}\sqrt{-\frac{5}{b}}\sin\left(\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)\right.}{}$

```
[In] int((e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/240/c^5*Pi^(1/2)*2^(1/2)*(-5/b)^(1/2)*(-48*(-1/b)^(1/2)*(-5/b)^(1/2)*cos(
a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*c^
4*d^2+48*(-1/b)^(1/2)*(-5/b)^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b
)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*c^4*d^2-24*(-1/b)^(1/2)*(-5/b)^(1/2)*c
os(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b
*c^2*d*e+24*(-1/b)^(1/2)*(-5/b)^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-
1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*c^2*d*e+8*(-3/b)^(1/2)*(-5/b)^(1/2)
*cos(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2
)/b)*b*c^2*d*e-8*(-3/b)^(1/2)*(-5/b)^(1/2)*sin(3*a/b)*FresnelS(3*2^(1/2)/Pi
^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*c^2*d*e-6*(-1/b)^(1/2)*(-5
```

```
/b)^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))
^(1/2)/b)*b*e^2+6*(-1/b)^(1/2)*(-5/b)^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1
/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*e^2+3*(-3/b)^(1/2)*(-5/b)^(1/
2)*cos(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1
/2)/b)*b*e^2-3*(-3/b)^(1/2)*(-5/b)^(1/2)*sin(3*a/b)*FresnelS(3*2^(1/2)/Pi^(
1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*b*e^2+3*cos(5*a/b)*FresnelC(5*
2^(1/2)/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*e^2-3*sin(5*a/b)*F
resnelS(5*2^(1/2)/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*e^2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{(d+ex^2)^2}{\sqrt{a+b\arcsin(cx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{(d+ex^2)^2}{\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{(d+ex^2)^2}{\sqrt{a+b\,\mathrm{asin}\,(cx)}}\,dx$$

```
[In] integrate((e*x**2+d)**2/(a+b*asin(c*x))**(1/2),x)
[Out] Integral((d + e*x**2)**2/sqrt(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{(d+ex^2)^2}{\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{(ex^2+d)^2}{\sqrt{b\arcsin(cx)+a}}\,dx$$

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
[Out] integrate((e*x^2 + d)^2/sqrt(b*arcsin(c*x) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.80 (sec) , antiderivative size = 975, normalized size of antiderivative = 1.44

$$\int \frac{(d+ex^2)^2}{\sqrt{a+b\arcsin(cx)}}\,dx = \text{Too large to display}$$

```
[In] integrate((e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*d^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2
*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(c*(I*sqrt(2)*b/
sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*d^2*erf(1/2*I*sqrt(2)*sqrt
(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt
(abs(b))/b)*e^(-I*a/b)/(c*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))
)) + 1/2*sqrt(pi)*d*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/
2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*s
qrt(b) + I*sqrt(6)*b^(3/2)/abs(b))*c^3) - 1/2*sqrt(pi)*d*e*erf(-1/2*I*sqrt(
2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) +
a)*sqrt(abs(b))/b)*e^(I*a/b)/(c^3*(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(
abs(b)))) - 1/2*sqrt(pi)*d*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt
(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(
c^3*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) + 1/2*sqrt(pi)*d*e*
erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arc
sin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*sqrt(b) - I*sqrt(6)*b^
(3/2)/abs(b))*c^3) - 1/16*sqrt(pi)*e^2*erf(-1/2*sqrt(10)*sqrt(b*arcsin(c*x)
 + a)/sqrt(b) - 1/2*I*sqrt(10)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(5
*I*a/b)/((sqrt(10)*sqrt(b) + I*sqrt(10)*b^(3/2)/abs(b))*c^5) - 1/8*sqrt(pi)
*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*
sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(c^5*(I*sqrt(2)*b/sqrt(ab
s(b)) + sqrt(2)*sqrt(abs(b)))) - 1/8*sqrt(pi)*e^2*erf(1/2*I*sqrt(2)*sqrt(b*
arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(ab
s(b))/b)*e^(-I*a/b)/(c^5*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))
) - 1/16*sqrt(pi)*e^2*erf(-1/2*sqrt(10)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1
/2*I*sqrt(10)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-5*I*a/b)/((sqrt(1
0)*sqrt(b) - I*sqrt(10)*b^(3/2)/abs(b))*c^5) + 3/16*sqrt(pi)*e^2*erf(-1/2*s
qrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) +
 a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(b)*c^5*(sqrt(6) + I*sqrt(6)*b/abs(b))
) + 3/16*sqrt(pi)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/
2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(b)*c
^5*(sqrt(6) - I*sqrt(6)*b/abs(b)))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex^2)^2}{\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{\left(e\,x^2+d\right)^2}{\sqrt{a+b\,\mathrm{asin}\left(c\,x\right)}}\,dx$$

```
[In] int((d + e*x^2)^2/(a + b*asin(c*x))^(1/2),x)
[Out] int((d + e*x^2)^2/(a + b*asin(c*x))^(1/2), x)
```

3.696 $\int \frac{d+ex^2}{\sqrt{a+b\arcsin(cx)}}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 329

$$\int \frac{d+ex^2}{\sqrt{a+b\arcsin(cx)}}\,dx = \frac{e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3} + \frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c} - \frac{e\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3} + \frac{e\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2\sqrt{b}c^3} + \frac{d\sqrt{2\pi}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c} - \frac{e\sqrt{\frac{\pi}{6}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{2\sqrt{b}c^3}$$

```
[Out] -1/12*e*cos(3*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2
))*6^(1/2)*Pi^(1/2)/c^3/b^(1/2)-1/12*e*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsi
n(c*x))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/c^3/b^(1/2)+1/4*e*cos(a/
b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1
/2)/c^3/b^(1/2)+1/4*e*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(
1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/c^3/b^(1/2)+d*cos(a/b)*FresnelC(2^(1/2)/Pi^
```

```
(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/c/b^(1/2)+d*Fresnel
S(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/
2)/c/b^(1/2)
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 329, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.450, Rules used = {4757, 4719, 3387, 3386, 3432, 3385, 3433, 4731, 4491}

$$\begin{aligned}\int \frac{d+ex^2}{\sqrt{a+b\arcsin(cx)}}\,dx=&\frac{\sqrt{\frac{\pi}{2}}e\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3}\\&-\frac{\sqrt{\frac{\pi}{6}}e\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3}\\&+\frac{\sqrt{\frac{\pi}{2}}e\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3}\\&-\frac{\sqrt{\frac{\pi}{6}}e\sin\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3}\\&+\frac{\sqrt{2\pi}d\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c}\\&+\frac{\sqrt{2\pi}d\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c}\end{aligned}$$

```
[In] Int[(d + e*x^2)/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (e*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b
]])/(2*Sqrt[b]*c^3) + (d*Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]])/(Sqrt[b]*c) - (e*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelC
[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(2*Sqrt[b]*c^3) + (e*Sqrt[P
i/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(2*Sq
rt[b]*c^3) + (d*Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sq
rt[b]]*Sin[a/b])/(Sqrt[b]*c) - (e*Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a +
b*ArcSin[c*x]])/Sqrt[b]]*Sin[(3*a)/b])/(2*Sqrt[b]*c^3)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
```

```
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4491

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rule 4731

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Dist[1
/(b*c^(m + 1)), Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a +
 b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{d}{\sqrt{a+b\arcsin(cx)}}+\frac{ex^2}{\sqrt{a+b\arcsin(cx)}}\right)dx\\
&= d\int \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx+e\int \frac{x^2}{\sqrt{a+b\arcsin(cx)}}\,dx\\
&= \frac{d\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{bc}\\
&\quad+\frac{e\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)\sin^2\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{bc^3}\\
&= \frac{e\text{Subst}\left(\int \left(-\frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}}+\frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right)dx,x,a+b\arcsin(cx)\right)}{bc^3}\\
&\quad+\frac{\left(d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{bc}\\
&\quad+\frac{\left(d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{bc}\\
&= -\frac{e\text{Subst}\left(\int \frac{\cos\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{4bc^3}\\
&\quad+\frac{e\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{4bc^3}\\
&\quad+\frac{\left(2d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(cx)}\right)}{bc}\\
&\quad+\frac{\left(2d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)dx,x,\sqrt{a+b\arcsin(cx)}\right)}{bc}
\end{aligned}$$

$$= \frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c} + \frac{d\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c} + \frac{\left(e\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{4bc^3} - \frac{\left(e\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{4bc^3} + \frac{\left(e\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{4bc^3} - \frac{\left(e\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{4bc^3}$$

$$= \frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c} + \frac{d\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c} + \frac{\left(e\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{2bc^3} - \frac{\left(e\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{2bc^3} + \frac{\left(e\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{2bc^3} - \frac{\left(e\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{2bc^3}$$

$$= \frac{e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3} + \frac{d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c} - \frac{e\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{2\sqrt{b}c^3} + \frac{e\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2\sqrt{b}c^3} + \frac{d\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c} - \frac{e\sqrt{\frac{\pi}{6}}\,\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{2\sqrt{b}c^3}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.41 (sec) , antiderivative size = 246, normalized size of antiderivative = 0.75

$$\int \frac{d+ex^2}{\sqrt{a+b\arcsin(cx)}}\,dx = -\frac{ie^{-\frac{3ia}{b}}\left(3(4c^2d+e)\,e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(cx))}{b}\right)-3(4c^2d+e)\,e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{1}{2},\frac{i(a}{}\right.\right.}{24c^3\sqrt{a+}}$$

```
[In] Integrate[(d + e*x^2)/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] ((-1/24*I)*(3*(4*c^2*d + e)*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c*x]))
/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] - 3*(4*c^2*d + e)*E^(((4*I)*a)
/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c*x]))/b] -
 Sqrt[3]*e*(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*Ar
cSin[c*x]))/b] - E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2,
 ((3*I)*(a + b*ArcSin[c*x]))/b])))/(c^3*E^(((3*I)*a)/b)*Sqrt[a + b*ArcSin[c
*x]])
```

Maple [A] (verified)

Time = 0.27 (sec) , antiderivative size = 310, normalized size of antiderivative = 0.94

method	result
default	$-\frac{\sqrt{\pi}\,\sqrt{2}\,\sqrt{-\frac{3}{b}}\left(4\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{-\frac{3}{b}}\,b\,c^2d-4\sin\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{-\frac{3}{b}}\,b\,c^2d\right.}{}$

```
[In] int((e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/12/c^3*Pi^(1/2)*2^(1/2)*(-3/b)^(1/2)*(4*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/
2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*(-3/b)^(1/2)*b*c^2*
d-4*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)
/b)*(-1/b)^(1/2)*(-3/b)^(1/2)*b*c^2*d+cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-
1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*(-3/b)^(1/2)*b*e-sin(a/b
)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^
(1/2)*(-3/b)^(1/2)*b*e+cos(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*
(a+b*arcsin(c*x))^(1/2)/b)*e-sin(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^
(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*e)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{d+ex^2}{\sqrt{a+b\arcsin(cx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{d+ex^2}{\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{d+ex^2}{\sqrt{a+b\operatorname{asin}(cx)}}\,dx$$

```
[In] integrate((e*x**2+d)/(a+b*asin(c*x))**(1/2),x)
[Out] Integral((d + e*x**2)/sqrt(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{d+ex^2}{\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{ex^2+d}{\sqrt{b\arcsin(cx)+a}}\,dx$$

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
[Out] integrate((e*x^2 + d)/sqrt(b*arcsin(c*x) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.66 (sec) , antiderivative size = 481, normalized size of antiderivative = 1.46

$$\int \frac{d+ex^2}{\sqrt{a+b\arcsin(cx)}}\,dx = -\frac{\sqrt{\pi}d\,\mathrm{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{c\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)} - \frac{\sqrt{\pi}d\,\mathrm{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{c\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)} + \frac{\sqrt{\pi}e\,\mathrm{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(cx)+a}}{2\sqrt{b}}-\frac{i\sqrt{6}\sqrt{b\arcsin(cx)+a}\sqrt{b}}{2|b|}\right)e^{\left(\frac{3ia}{b}\right)}}{4\left(\sqrt{6}\sqrt{b}+\frac{i\sqrt{6}b^{\frac{3}{2}}}{|b|}\right)c^3} - \frac{\sqrt{\pi}e\,\mathrm{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{4c^3\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)} - \frac{\sqrt{\pi}e\,\mathrm{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{4c^3\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)} + \frac{\sqrt{\pi}e\,\mathrm{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(cx)+a}}{2\sqrt{b}}+\frac{i\sqrt{6}\sqrt{b\arcsin(cx)+a}\sqrt{b}}{2|b|}\right)e^{\left(-\frac{3ia}{b}\right)}}{4\left(\sqrt{6}\sqrt{b}-\frac{i\sqrt{6}b^{\frac{3}{2}}}{|b|}\right)c^3}$$

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*d*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*s
qrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(c*(I*sqrt(2)*b/sq
rt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*d*erf(1/2*I*sqrt(2)*sqrt(b*a
rcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs
(b))/b)*e^(-I*a/b)/(c*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) +
 1/4*sqrt(pi)*e*erf(-1/2*sqrt(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) - 1/2*I*sq
rt(6)*sqrt(b*arcsin(c*x) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*sqrt(b)
 + I*sqrt(6)*b^(3/2)/abs(b))*c^3) - 1/4*sqrt(pi)*e*erf(-1/2*I*sqrt(2)*sqrt(
b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(
abs(b))/b)*e^(I*a/b)/(c^3*(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))
) - 1/4*sqrt(pi)*e*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) -
 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(c^3*(-I*sq
rt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) + 1/4*sqrt(pi)*e*erf(-1/2*sqr
t(6)*sqrt(b*arcsin(c*x) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(c*x) + a
)*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs(b)
)*c^3)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{d+ex^2}{\sqrt{a+b\arcsin(cx)}}\,dx=\int \frac{e\,x^2+d}{\sqrt{a+b\,\mathrm{asin}\left(c\,x\right)}}\,dx$$

```
[In] int((d + e*x^2)/(a + b*asin(c*x))^(1/2),x)
[Out] int((d + e*x^2)/(a + b*asin(c*x))^(1/2), x)
```

3.697 $\int \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 101

$$\int \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx=\frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c}+\frac{\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c}$$

```
[Out] cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)
*Pi^(1/2)/c/b^(1/2)+FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/
2))*sin(a/b)*2^(1/2)*Pi^(1/2)/c/b^(1/2)
```

Rubi [A] (verified)

Time = 0.06 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4719, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx=\frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c}+\frac{\sqrt{2\pi}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c}$$

```
[In] Int[1/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] (Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]
)/(Sqrt[b]*c) + (Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/S
qrt[b]]*Sin[a/b])/(Sqrt[b]*c)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4719

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[1/(b*c), Sub
st[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c
, n}, x]
```

Rubi steps

$$\begin{aligned}\text{integral} &= \frac{\text{Subst}\left(\int \frac{\cos\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{bc}\\ &= \frac{\cos\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{bc}\\ &\quad+\frac{\sin\left(\frac{a}{b}\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{bc}\end{aligned}$$

$$= \frac{\left(2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{bc} + \frac{\left(2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{bc}$$

$$= \frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{\sqrt{b}c} + \frac{\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}c}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.06 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.20

$$\int \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx = \frac{ie^{-\frac{ia}{b}}\left(-\sqrt{-\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{1}{2}, -\frac{i(a+b\arcsin(cx))}{b}\right) + e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{1}{2}, \frac{i(a+b\arcsin(cx))}{b}\right)\right)}{2c\sqrt{a+b\arcsin(cx)}}$$

```
[In] Integrate[1/Sqrt[a + b*ArcSin[c*x]],x]
```

```
[Out] ((I/2)*(-(Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin
[c*x]))/b]) + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I
*(a + b*ArcSin[c*x]))/b]))/(c*E^((I*a)/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] (verified)

Time = 0.02 (sec) , antiderivative size = 90, normalized size of antiderivative = 0.89

method	result	size
default	$\frac{\sqrt{2}\sqrt{\pi}\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)-\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)\right)}{c}$	90

```
[In] int(1/(a+b*arcsin(c*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1
/2)*(a+b*arcsin(c*x))^(1/2)/b)-sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1
/2)*(a+b*arcsin(c*x))^(1/2)/b))/c
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{1}{\sqrt{a+b\,\mathrm{asin}\,(cx)}}\,dx$$

```
[In] integrate(1/(a+b*asin(c*x))**(1/2),x)
[Out] Integral(1/sqrt(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{1}{\sqrt{b\arcsin\,(cx)+a}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
[Out] integrate(1/sqrt(b*arcsin(c*x) + a), x)
```

Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.37 (sec) , antiderivative size = 159, normalized size of antiderivative = 1.57

$$\int \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx = -\frac{\sqrt{\pi}\,\mathrm{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2\,b}\right)e^{\left(\frac{i\,a}{b}\right)}}{c\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)} - \frac{\sqrt{\pi}\,\mathrm{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(cx)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(cx)+a}\sqrt{|b|}}{2\,b}\right)e^{\left(-\frac{i\,a}{b}\right)}}{c\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$

```
[In] integrate(1/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(c*x) + a)/sqrt(abs(b)) - 1/2*sqr
t(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(c*(I*sqrt(2)*b/sqrt
(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*erf(1/2*I*sqrt(2)*sqrt(b*arcsi
n(c*x) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(c*x) + a)*sqrt(abs(b))
/b)*e^(-I*a/b)/(c*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b))))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a+b\arcsin(cx)}}\,dx=\int \frac{1}{\sqrt{a+b\,\mathrm{asin}\left(c\,x\right)}}\,dx$$

```
[In] int(1/(a + b*asin(c*x))^(1/2),x)
```

```
[Out] int(1/(a + b*asin(c*x))^(1/2), x)
```

3.698 $\int \frac{1}{(d+ex^2)\sqrt{a+b\arcsin(cx)}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{1}{(d+ex^2)\sqrt{a+b\arcsin(cx)}}\,dx = \mathrm{Int}\left(\frac{1}{(d+ex^2)\sqrt{a+b\arcsin(cx)}},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.05 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+ex^2)\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{1}{(d+ex^2)\sqrt{a+b\arcsin(cx)}}\,dx$$

```
[In] Int[1/((d + e*x^2)*Sqrt[a + b*ArcSin[c*x]]),x]
[Out] Defer[Int][1/((d + e*x^2)*Sqrt[a + b*ArcSin[c*x]]), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex^2)\sqrt{a+b\arcsin(cx)}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.18 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{1}{(d+ex^2)\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{1}{(d+ex^2)\sqrt{a+b\arcsin(cx)}}\,dx$$

```
[In] Integrate[1/((d + e*x^2)*Sqrt[a + b*ArcSin[c*x]]),x]
[Out] Integrate[1/((d + e*x^2)*Sqrt[a + b*ArcSin[c*x]]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 0.97 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{(e\,x^2+d)\sqrt{a+b\arcsin(cx)}}dx$$

```
[In] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x)
[Out] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(d+ex^2)\sqrt{a+b\arcsin(cx)}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 2.29 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{(d+ex^2)\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{1}{\sqrt{a+b\operatorname{asin}(cx)}\,(d+ex^2)}\,dx$$

```
[In] integrate(1/(e*x**2+d)/(a+b*asin(c*x))**(1/2),x)
[Out] Integral(1/(sqrt(a + b*asin(c*x))*(d + e*x**2)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(d+ex^2)\sqrt{a+b\arcsin(cx)}}\,dx = \text{Exception raised: ValueError}$$

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e>0)', see `assume?` for more detai
ls)Is e
```

Giac [N/A]

Not integrable

Time = 0.67 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{1}{(ex^2+d)\sqrt{b\arcsin(cx)+a}}\,dx$$

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)*sqrt(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{1}{\sqrt{a+b\,\mathrm{asin}(c\,x)}\,(e\,x^2+d)}\,dx$$

```
[In] int(1/((a + b*asin(c*x))^(1/2)*(d + e*x^2)),x)
```

```
[Out] int(1/((a + b*asin(c*x))^(1/2)*(d + e*x^2)), x)
```

3.699 $\int \frac{1}{(d+ex^2)^2 \sqrt{a+b \arcsin(cx)}} \, dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{1}{(d+ex^2)^2 \sqrt{a+b \arcsin(cx)}} \, dx = \text{Int}\left(\frac{1}{(d+ex^2)^2 \sqrt{a+b \arcsin(cx)}}, x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+ex^2)^2 \sqrt{a+b \arcsin(cx)}} \, dx = \int \frac{1}{(d+ex^2)^2 \sqrt{a+b \arcsin(cx)}} \, dx$$

```
[In] Int[1/((d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]]),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]]), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex^2)^2 \sqrt{a+b \arcsin(cx)}} \, dx$$

Mathematica [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{1}{(d+ex^2)^2\sqrt{a+b\arcsin(cx)}}\,dx=\int \frac{1}{(d+ex^2)^2\sqrt{a+b\arcsin(cx)}}\,dx$$

```
[In] Integrate[1/((d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]]),x]
[Out] Integrate[1/((d + e*x^2)^2*Sqrt[a + b*ArcSin[c*x]]), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.21 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{(e\,x^2+d)^2\sqrt{a+b\arcsin(cx)}}dx$$

```
[In] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x)
[Out] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(d+ex^2)^2\sqrt{a+b\arcsin(cx)}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 45.90 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^2\sqrt{a+b\arcsin(cx)}}\,dx=\int \frac{1}{\sqrt{a+b\,\mathrm{asin}\,(cx)}\,(d+ex^2)^2}\,dx$$

```
[In] integrate(1/(e*x**2+d)**2/(a+b*asin(c*x))**(1/2),x)
[Out] Integral(1/(sqrt(a + b*asin(c*x))*(d + e*x**2)**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.66 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^2\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{1}{(ex^2+d)^2\sqrt{b\arcsin(cx)+a}}\,dx$$

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="maxima")
[Out] integrate(1/((e*x^2 + d)^2*sqrt(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.92 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^2\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{1}{(ex^2+d)^2\sqrt{b\arcsin(cx)+a}}\,dx$$

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(1/2),x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)^2*sqrt(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^2\sqrt{a+b\arcsin(cx)}}\,dx = \int \frac{1}{\sqrt{a+b\,\mathrm{asin}\,(c\,x)}\,(e\,x^2+d)^2}\,dx$$

```
[In] int(1/((a + b*asin(c*x))^(1/2)*(d + e*x^2)^2),x)
[Out] int(1/((a + b*asin(c*x))^(1/2)*(d + e*x^2)^2), x)
```

3.700 $\int \frac{d+ex^2}{(a+b\arcsin(cx))^{3/2}}\,dx$

Optimal result

Integrand size = 20, antiderivative size = 394

$$\begin{aligned}\int \frac{d+ex^2}{(a+b\arcsin(cx))^{3/2}}\,dx = &-\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}}\\ &-\frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}}-\frac{e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}\\ &-\frac{2d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}\\ &+\frac{e\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}\\ &+\frac{e\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}c^3}\\ &+\frac{2d\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}c}\\ &-\frac{e\sqrt{\frac{3\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{b^{3/2}c^3}\end{aligned}$$

```
[Out] -1/2*e*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*
2^(1/2)*Pi^(1/2)/b^(3/2)/c^3+1/2*e*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*
x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c^3+1/2*e*cos(3*a/b)*F
resnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/2)/
```

```
b^(3/2)/c^3-1/2*e*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2)
)*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(3/2)/c^3-2*d*cos(a/b)*FresnelS(2^(1/2)/Pi^
(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(3/2)/c+2*d*Fresn
elC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(
1/2)/b^(3/2)/c-2*d*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))^(1/2)-2*e*x^2*(
-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))^(1/2)
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 394, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.450, Rules used = {4757, 4717, 4809, 3387, 3386, 3432, 3385, 3433, 4727}

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{\sqrt{\frac{\pi}{2}}e\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3} - \frac{\sqrt{\frac{3\pi}{2}}e\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3} - \frac{\sqrt{\frac{\pi}{2}}e\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3} + \frac{\sqrt{\frac{3\pi}{2}}e\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3} + \frac{2\sqrt{2\pi}d\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} - \frac{2\sqrt{2\pi}d\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} - \frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}}$$

```
[In] Int[(d + e*x^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (-2*d*Sqrt[1 - c^2*x^2])/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (2*e*x^2*Sqrt[1 -
c^2*x^2])/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (e*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(
Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2)*c^3) - (2*d*Sqrt[2*P
i]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2
)*c) + (e*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSi
n[c*x]])/Sqrt[b]])/(b^(3/2)*c^3) + (e*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[
a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^(3/2)*c^3) + (2*d*Sqrt[2*Pi]*Fres
```

```
nelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b])/(b^(3/2)*c) -
(e*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Si
n[(3*a)/b])/(b^(3/2)*c^3)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4727

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Dist
[1/(b^2*c^(m + 1)*(n + 1)), Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
+ x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*x
]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

Rule 4757

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x])^n, (d + e*x^2)^p, x], x
] /; FreeQ[{a, b, c, d, e, n}, x] && NeQ[c^2*d + e, 0] && IntegerQ[p] && (G
tQ[p, 0] || IGtQ[n, 0])
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\text{integral} &= \int \left(\frac{d}{(a+b\arcsin(cx))^{3/2}}+\frac{ex^2}{(a+b\arcsin(cx))^{3/2}}\right)dx\\
&= d\int \frac{1}{(a+b\arcsin(cx))^{3/2}}\,dx+e\int \frac{x^2}{(a+b\arcsin(cx))^{3/2}}\,dx\\
&= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}}-\frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}}-\frac{(2cd)\int \frac{x}{\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx}{b}\\
&\quad+\frac{(2e)\text{Subst}\left(\int \left(-\frac{3\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{4\sqrt{x}}+\frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{4\sqrt{x}}\right)dx,x,a+b\arcsin(cx)\right)}{b^2c^3}\\
&= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}}-\frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}}\\
&\quad+\frac{(2d)\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{b^2c}\\
&\quad+\frac{e\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3}\\
&\quad-\frac{(3e)\text{Subst}\left(\int \frac{\sin\left(\frac{3a}{b}-\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3}
\end{aligned}$$

$$= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{\left(2d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{b^2c} - \frac{\left(e\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3} + \frac{\left(3e\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\sin\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3} + \frac{\left(2d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{b^2c} + \frac{\left(e\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3} - \frac{\left(3e\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\frac{\cos\left(\frac{3x}{b}\right)}{\sqrt{x}}\,dx,x,a+b\arcsin(cx)\right)}{2b^2c^3}$$

$$= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{\left(4d\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c} - \frac{\left(e\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^3} + \frac{\left(3e\cos\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\sin\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^3} + \frac{\left(4d\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c} + \frac{\left(e\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^3} - \frac{\left(3e\sin\left(\frac{3a}{b}\right)\right)\text{Subst}\left(\int\cos\left(\frac{3x^2}{b}\right)\,dx,x,\sqrt{a+b\arcsin(cx)}\right)}{b^2c^3}$$

$$= -\frac{2d\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{2ex^2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}}$$
$$- \frac{e\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}$$
$$- \frac{2d\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c}$$
$$+ \frac{e\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c^3}$$
$$+ \frac{e\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}c^3}$$
$$+ \frac{2d\sqrt{2\pi}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}c}$$
$$- \frac{e\sqrt{\frac{3\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{b^{3/2}c^3}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.79 (sec) , antiderivative size = 417, normalized size of antiderivative = 1.06

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{e^{-\frac{3i(a+b\arcsin(cx))}{b}}\left(ee^{\frac{3ia}{b}} - 4c^2de^{\frac{3ia}{b}+2i\arcsin(cx)} - ee^{\frac{3ia}{b}+2i\arcsin(cx)} - 4c^2de^{\frac{3ia}{b}+4i\arcsin}\right.}{}$$

```
[In] Integrate[(d + e*x^2)/(a + b*ArcSin[c*x])^(3/2),x]
```

```
[Out] (e*E^(((3*I)*a)/b) - 4*c^2*d*E^(((3*I)*a)/b + (2*I)*ArcSin[c*x]) - e*E^(((3
*I)*a)/b + (2*I)*ArcSin[c*x]) - 4*c^2*d*E^(((3*I)*a)/b + (4*I)*ArcSin[c*x])
 - e*E^(((3*I)*a)/b + (4*I)*ArcSin[c*x]) + e*E^(((3*I)*(a + 2*b*ArcSin[c*x]
))/b) + (4*c^2*d + e)*E^(((2*I)*a)/b + (3*I)*ArcSin[c*x])*Sqrt[((-I)*(a + b
*ArcSin[c*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c*x]))/b] + (4*c^2*d + e)*
E^(((4*I)*a)/b + (3*I)*ArcSin[c*x])*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1
/2, (I*(a + b*ArcSin[c*x]))/b] - Sqrt[3]*e*E^((3*I)*ArcSin[c*x])*Sqrt[((-I)
*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c*x]))/b] - Sqrt[
3]*e*E^((3*I)*((2*a)/b + ArcSin[c*x]))*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamm
a[1/2, ((3*I)*(a + b*ArcSin[c*x]))/b])/(4*b*c^3*E^(((3*I)*(a + b*ArcSin[c*x
]))/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] (verified)

Time = 0.35 (sec) , antiderivative size = 460, normalized size of antiderivative = 1.17

method	result
default	$\frac{4\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\cos\left(\frac{a}{b}\right)\,\mathrm{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{a+b\arcsin(cx)}\,c^2d+4\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sin\left(\frac{a}{b}\right)\,\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{}}{}$

```
[In] int((e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/c^3/b*(4*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/
2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*c^2*d+4*
(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/
2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*c^2*d+(-1/b)^(1/2)*Pi
^(1/2)*2^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(
c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*e+(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*sin(
a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b
*arcsin(c*x))^(1/2)*e-(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)*cos(3*a/b)*FresnelS(3*2
^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(
1/2)*e-(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)
/(-3/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(a+b*arcsin(c*x))^(1/2)*e-4*cos(-(
a+b*arcsin(c*x))/b+a/b)*c^2*d+cos(-3*(a+b*arcsin(c*x))/b+3*a/b)*e-cos(-(a+b
*arcsin(c*x))/b+a/b)*e)/(a+b*arcsin(c*x))^(1/2)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{d+ex^2}{(a+b\,\mathrm{asin}\,(cx))^{\frac{3}{2}}}\,dx$$

```
[In] integrate((e*x**2+d)/(a+b*asin(c*x))**(3/2),x)
[Out] Integral((d + e*x**2)/(a + b*asin(c*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{ex^2+d}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
[Out] integrate((e*x^2 + d)/(b*arcsin(c*x) + a)^(3/2), x)
```

Giac [F]

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{ex^2+d}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate((e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] integrate((e*x^2 + d)/(b*arcsin(c*x) + a)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{d+ex^2}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{e\,x^2+d}{(a+b\,\mathrm{asin}\,(c\,x))^{3/2}}\,dx$$

```
[In] int((d + e*x^2)/(a + b*asin(c*x))^(3/2),x)
[Out] int((d + e*x^2)/(a + b*asin(c*x))^(3/2), x)
```

3.701 $\int \frac{1}{(a+b\arcsin(cx))^{3/2}}\,dx$

Optimal result

Integrand size = 12, antiderivative size = 137

$$\int \frac{1}{(a+b\arcsin(cx))^{3/2}}\,dx = -\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} + \frac{2\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}c}$$

```
[Out] -2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/b^(1/2))*2^(1
/2)*Pi^(1/2)/b^(3/2)/c+2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(c*x))^(1/2)/
b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/c-2*(-c^2*x^2+1)^(1/2)/b/c/(a+b*
arcsin(c*x))^(1/2)
```

Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {4717, 4809, 3387, 3386, 3432, 3385, 3433}

$$\int \frac{1}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{2\sqrt{2\pi}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} - \frac{2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} - \frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}}$$

```
[In] Int[(a + b*ArcSin[c*x])^(-3/2),x]
```

```
[Out] (-2*Sqrt[1 - c^2*x^2])/(b*c*Sqrt[a + b*ArcSin[c*x]]) - (2*Sqrt[2*Pi]*Cos[a/
b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]])/(b^(3/2)*c) + (2
*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c*x]])/Sqrt[b]]*Sin[a/b]
)/(b^(3/2)*c)
```

Rule 3385

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3386

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3387

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[Cos
[(d*e - c*f)/d], Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Dist[Sin[(d
*e - c*f)/d], Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d,
e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

Rule 3432

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 3433

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

Rule 4717

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Dist[c/(b*(n + 1)),
 Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a,
 b, c}, x] && LtQ[n, -1]
```

Rule 4809

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Dist[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p], Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x, a
```

```
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
&& IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Rubi steps

$$\text{integral} = -\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{(2c)\int \frac{x}{\sqrt{1-c^2x^2}\sqrt{a+b\arcsin(cx)}}\,dx}{b}$$
$$= -\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}} + \frac{2\text{Subst}\left(\int \frac{\sin\left(\frac{a}{b}-\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$
$$= -\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{\left(2\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\sin\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c} + \frac{\left(2\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \frac{\cos\left(\frac{x}{b}\right)}{\sqrt{x}}\,dx, x, a+b\arcsin(cx)\right)}{b^2c}$$
$$= -\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{\left(4\cos\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \sin\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2c} + \frac{\left(4\sin\left(\frac{a}{b}\right)\right)\text{Subst}\left(\int \cos\left(\frac{x^2}{b}\right)\,dx, x, \sqrt{a+b\arcsin(cx)}\right)}{b^2c}$$
$$= -\frac{2\sqrt{1-c^2x^2}}{bc\sqrt{a+b\arcsin(cx)}} - \frac{2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)}{b^{3/2}c} + \frac{2\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(cx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}c}$$

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.22 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.22

$$\int \frac{1}{(a+b\arcsin(cx))^{3/2}}\,dx = \frac{e^{-\frac{i(a+b\arcsin(cx))}{b}}\left(e^{i\arcsin(cx)}\sqrt{-\frac{i(a+b\arcsin(cx))}{b}}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(cx))}{b}\right)+e^{\frac{ia}{b}}\left(-1-\right.\right.}{bc\sqrt{a+b\arcsin(}}$$

```
[In] Integrate[(a + b*ArcSin[c*x])^(-3/2),x]
```

```
[Out] (E^(I*ArcSin[c*x])*Sqrt[((-I)*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, ((-I)*(a +
 b*ArcSin[c*x]))/b] + E^((I*a)/b)*(-1 - E^((2*I)*ArcSin[c*x]) + E^((I*(a +
b*ArcSin[c*x]))/b)*Sqrt[(I*(a + b*ArcSin[c*x]))/b]*Gamma[1/2, (I*(a + b*Arc
Sin[c*x]))/b]))/(b*c*E^((I*(a + b*ArcSin[c*x]))/b)*Sqrt[a + b*ArcSin[c*x]])
```

Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.15

method	result
default	$-\frac{2\left(-\sqrt{2}\,\sqrt{a+b\arcsin(cx)}\,\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(cx)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}-\sqrt{2}\,\sqrt{a+b\arcsin(cx)}\,\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(c}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right.\right.}{cb\sqrt{a+b\arcsin(cx)}}$

```
[In] int(1/(a+b*arcsin(c*x))^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/c/b/(a+b*arcsin(c*x))^(1/2)*(-2^(1/2)*(a+b*arcsin(c*x))^(1/2)*cos(a/b)*F
resnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/
2)*Pi^(1/2)-2^(1/2)*(a+b*arcsin(c*x))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1
/2)/(-1/b)^(1/2)*(a+b*arcsin(c*x))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)+cos(-(a+b
*arcsin(c*x))/b+a/b))
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(cx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{1}{(a+b\operatorname{asin}(cx))^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*asin(c*x))**(3/2),x)
```

```
[Out] Integral((a + b*asin(c*x))**(-3/2), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{1}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
[Out] integrate((b*arcsin(c*x) + a)^(-3/2), x)
```

Giac [F]

$$\int \frac{1}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{1}{(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] integrate((b*arcsin(c*x) + a)^(-3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{1}{(a+b\operatorname{asin}(c\,x))^{3/2}}\,dx$$

```
[In] int(1/(a + b*asin(c*x))^(3/2),x)
[Out] int(1/(a + b*asin(c*x))^(3/2), x)
```

3.702 $\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^{3/2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^{3/2}}\,dx = \mathrm{Int}\left(\frac{1}{(d+ex^2)(a+b\arcsin(cx))^{3/2}},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^{3/2}}\,dx$$

```
[In] Int[1/((d + e*x^2)*(a + b*ArcSin[c*x])^(3/2)),x]
[Out] Defer[Int][1/((d + e*x^2)*(a + b*ArcSin[c*x])^(3/2)), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^{3/2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.20 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^{3/2}}\,dx=\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^{3/2}}\,dx$$

```
[In] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])^(3/2)),x]
[Out] Integrate[1/((d + e*x^2)*(a + b*ArcSin[c*x])^(3/2)), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.13 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{(e\,x^2+d)\,(a+b\arcsin(cx))^{\frac{3}{2}}}dx$$

```
[In] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x)
[Out] int(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^{3/2}}\,dx=\text{Exception raised: TypeError}$$

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [N/A]

Not integrable

Time = 12.77 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{(d+ex^2)(a+b\arcsin(cx))^{3/2}}\,dx=\int \frac{1}{(a+b\,\mathrm{asin}\,(cx))^{\frac{3}{2}}\,(d+ex^2)}\,dx$$

```
[In] integrate(1/(e*x**2+d)/(a+b*asin(c*x))**(3/2),x)
[Out] Integral(1/((a + b*asin(c*x))**(3/2)*(d + e*x**2)), x)
```

Maxima [N/A]

Not integrable

Time = 0.62 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)\,(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{1}{(ex^2+d)(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
[Out] integrate(1/((e*x^2 + d)*(b*arcsin(c*x) + a)^(3/2)), x)
```

Giac [N/A]

Not integrable

Time = 0.81 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)\,(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{1}{(ex^2+d)(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(e*x^2+d)/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)*(b*arcsin(c*x) + a)^(3/2)), x)
```

Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)\,(a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c\,x))^{3/2}\,(e\,x^2+d)}\,dx$$

```
[In] int(1/((a + b*asin(c*x))^(3/2)*(d + e*x^2)),x)
[Out] int(1/((a + b*asin(c*x))^(3/2)*(d + e*x^2)), x)
```

3.703 $\int \frac{1}{(d+ex^2)^2(a+b\arcsin(cx))^{3/2}}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 22

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^{3/2}}\,dx = \text{Int}\left(\frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^{3/2}},x\right)$$

```
[Out] Unintegrable(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x)
```

Rubi [N/A]

Not integrable

Time = 0.04 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 0, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^{3/2}}\,dx$$

```
[In] Int[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^(3/2)),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^(3/2)), x]
```

Rubi steps

$$\text{integral} = \int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^{3/2}}\,dx$$

Mathematica [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.09

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^{3/2}}\,dx$$

```
[In] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^(3/2)),x]
[Out] Integrate[1/((d + e*x^2)^2*(a + b*ArcSin[c*x])^(3/2)), x]
```

Maple [N/A] (verified)

Not integrable

Time = 1.17 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.91

$$\int \frac{1}{(e\,x^2+d)^2 (a+b\arcsin(cx))^{\frac{3}{2}}}dx$$

```
[In] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x)
[Out] int(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x)
```

Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^{3/2}}\,dx = \text{Timed out}$$

```
[In] integrate(1/(e*x**2+d)**2/(a+b*asin(c*x))**(3/2),x)
[Out] Timed out
```

Maxima [N/A]

Not integrable

Time = 0.64 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{1}{(ex^2+d)^2(b\arcsin(cx)+a)^{\frac{3}{2}}}\,dx$$

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="maxima")
[Out] integrate(1/((e*x^2 + d)^2*(b*arcsin(c*x) + a)^(3/2)), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

```
[In] integrate(1/(e*x^2+d)^2/(a+b*arcsin(c*x))^(3/2),x, algorithm="giac")
[Out] Exception raised: RuntimeError >> an error occurred running a Giac command:
INPUT:sage2OUTPUT:Not invertible Error: Bad Argument Value
```

Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int \frac{1}{(d+ex^2)^2 (a+b\arcsin(cx))^{3/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\left(c\,x\right))^{3/2}\,(e\,x^2+d)^2}\,dx$$

```
[In] int(1/((a + b*asin(c*x))^(3/2)*(d + e*x^2)^2),x)
[Out] int(1/((a + b*asin(c*x))^(3/2)*(d + e*x^2)^2), x)
```

CHAPTER 4

APPENDIX

4.1 Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* Nasser: April 7,2022. add second output which gives reason for the grade *)
(*                       Small rewrite of logic in main function to make it*)
(*                       match Maple's logic. No change in functionality otherwise*)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)


(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
```

```
(*          GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] := Module[{expnResult,expnOptimal,leafCountResult,leafCou
    expnResult  = ExpnType[result];
    expnOptimal = ExpnType[optimal];
    leafCountResult = LeafCount[result];
    leafCountOptimal = LeafCount[optimal];

    (*Print["expnResult=",expnResult," expnOptimal=",expnOptimal];*)
    If[expnResult<=expnOptimal,
        If[Not[FreeQ[result,Complex]], (*result contains complex*)
            If[Not[FreeQ[optimal,Complex]], (*optimal contains complex*)
                If[leafCountResult<=2*leafCountOptimal,
                    finalresult={"A",""}
                    ,(*ELSE*)
                    finalresult={"B","Both result and optimal contain complex but leaf count is
                  ]
            ,(*ELSE*)
                finalresult={"C","Result contains complex when optimal does not."}
            ]
        ,(*ELSE*)(*result does not contains complex*)
            If[leafCountResult<=2*leafCountOptimal,
               finalresult={"A",""}
            ,(*ELSE*)
               finalresult={"B","Leaf count is larger than twice the leaf count of optimal. $"<
              ]
        ]
    ,(*ELSE*) (*expnResult>expnOptimal*)
        If[FreeQ[result,Integrate] && FreeQ[result,Int],
            finalresult={"C","Result contains higher order function than in optimal. Order "<>T
            ,
            finalresult={"F","Contains unresolved integral."}
        ]
    ];

    finalresult
]

(* ::Text:: *)
(*The following summarizes the type number assigned an *)
```

```
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
  Exp,Log,
  Sin,Cos,Tan,Cot,Sec,Csc,
  ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
```

```
  Sinh,Cosh,Tanh,Coth,Sech,Csch,
  ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
  Erf, Erfc, Erfi,
  FresnelS, FresnelC,
  ExpIntegralE, ExpIntegralEi, LogIntegral,
  SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
  Gamma, LogGamma, PolyGamma,
  Zeta, PolyLog, ProductLog,
  EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]


AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems
#Nasser 4/07/2022   add second output which gives reason for the grade

GradeAntiderivative := proc(result,optimal)
local leaf_count_result,
        leaf_count_optimal,
        ExpnType_result,
        ExpnType_optimal,
        debug:=false;

        leaf_count_result:=leafcount(result);
```

```
        #do NOT call ExpnType() if leaf size is too large. Recursion problem
        if leaf_count_result > 500000 then
            return "B","result has leaf size over 500,000. Avoiding possible recursion issues
        fi;

        leaf_count_optimal := leafcount(optimal);
        ExpnType_result  := ExpnType(result);
        ExpnType_optimal := ExpnType(optimal);

        if debug then
            print("ExpnType_result",ExpnType_result," ExpnType_optimal=",ExpnType_optimal);
        fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

    #This check below actually is not needed, since I only
    #call this grading only for passed integrals. i.e. I check
    #for "F" before calling this. But no harm of keeping it here.
    #just in case.


    if not type(result,freeof('int')) then
        return "F","Result contains unresolved integral";
    fi;


    if ExpnType_result<=ExpnType_optimal then
        if debug then
             print("ExpnType_result<=ExpnType_optimal");
        fi;
        if is_contains_complex(result) then
            if is_contains_complex(optimal) then
                if debug then
                        print("both result and optimal complex");
                fi;
                if leaf_count_result<=2*leaf_count_optimal then
                    return "A"," ";
                else
                   return "B",cat("Both result and optimal contain complex but leaf count of
                                convert(leaf_count_result,string)," vs. $2 (",
```

```
                                   convert(leaf_count_optimal,string)," ) = ",convert(2*leaf_co
                 end if
             else #result contains complex but optimal is not
                 if debug then
                         print("result contains complex but optimal is not");
                 fi;
                 return "C","Result contains complex when optimal does not.";
             fi;
         else # result do not contain complex
              # this assumes optimal do not as well. No check is needed here.
             if debug then
                    print("result do not contain complex, this assumes optimal do not as well")
             fi;
             if leaf_count_result<=2*leaf_count_optimal then
                 if debug then
                     print("leaf_count_result<=2*leaf_count_optimal");
                 fi;
                 return "A"," ";
             else
                 if debug then
                     print("leaf_count_result>2*leaf_count_optimal");
                 fi;
                 return "B",cat("Leaf count of result is larger than twice the leaf count of opt
                                   convert(leaf_count_result,string),"$ vs. $2(",
                                   convert(leaf_count_optimal,string),")=",convert(2*leaf_count
             fi;
         fi;
     else #ExpnType(result) > ExpnType(optimal)
         if debug then
             print("ExpnType(result) > ExpnType(optimal)");
         fi;
         return "C",cat("Result contains higher order function than in optimal. Order ",
                       convert(ExpnType_result,string)," vs. order ",
                       convert(ExpnType_optimal,string),".");
     fi;

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:
```

```
# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
```

```
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#             Port of original Maple grading function by
#             Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#             added 'exp_polar'
from sympy import *

def leaf_count(expr):
    #sympy do not have leaf count function. This is approximation
    return round(1.7*count_ops(expr))

def is_sqrt(expr):
    if isinstance(expr,Pow):
        if expr.args[1] == Rational(1,2):
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
            asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
            asinh,acosh,atanh,acoth,asech,acsch
        ]

def is_special_function(func):
    return func in [ erf,erfc,erfi,
             fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
             gamma,loggamma,digamma,zeta,polylog,LambertW,
             elliptic_f,elliptic_e,elliptic_pi,exp_polar
         ]

def is_hypergeometric_function(func):
    return func in [hyper]

def is_appell_function(func):
    return func in [appellf1]

def is_atom(expn):
    try:
        if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
          return True
        else:
          return False
```

```
    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))   #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):    #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):   #type(op(2,expn),'integer')
            return expnType(expn.args[0])    #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):   #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))   #max(2,ExpnType(op(1,expn)))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,ExpnType(op(1,expn)),ExpnTy
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)   #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):   #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))   #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)    #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
```

```
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    #print ("Enter grade_antiderivative for sagemath")
    #print("Enter grade_antiderivative, result=",result," optimal=",optimal)

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    #print("leaf_count_result=",leaf_count_result)
    #print("leaf_count_optimal=",leaf_count_optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        grade = "F"
        grade_annotation =""
    else:
        if expnType_result <= expnType_optimal:
            if result.has(I):
                if optimal.has(I): #both result and optimal complex
                    if leaf_count_result <= 2*leaf_count_optimal:
                        grade = "A"
                        grade_annotation =""
                    else:
                        grade = "B"
                        grade_annotation ="Both result and optimal contain complex but leaf count of result is large
                else: #result contains complex but optimal is not
                    grade = "C"
                    grade_annotation ="Result contains complex when optimal does not."
            else: # result do not contain complex, this assumes optimal do not as well
                if leaf_count_result <= 2*leaf_count_optimal:
                    grade = "A"
                    grade_annotation =""
                else:
                    grade = "B"
                    grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(le
        else:
            grade = "C"
            grade_annotation ="Result contains higher order function than in optimal. Order "+str(ExpnType_
```

```
    #print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

    return grade, grade_annotation
```

SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#               Albert Rich to use with Sagemath. This is used to
#               grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#               'arctan2','floor','abs','log_integral'
#June 4, 2022  Made default grade_annotation "none" instead of "" due
#               issue later when reading the file.
#July 14, 2022. Added ellipticF. This is until they fix sagemath, then remove it.

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    #print("Enter tree_size, expr is ",expr)

    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)

def is_sqrt(expr):
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
        else:
            return False
    else:
        return False
```

```
def is_elementary_function(func):
    #debug=False
    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    #debug=False
    if debug:
        print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
          'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','sinh_integral'
          'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
          'polylog','lambert_w','elliptic_f','elliptic_e','ellipticF',
          'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in sagemath
```

```
def is_atom(expn):

   #debug=False
   if debug:
       print ("Enter is_atom, expn=",expn)

   if not hasattr(expn, 'parent'):
      return False


   #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic-ty
   try:
      if expn.parent() is SR:
         return expn.operator() is None
      if expn.parent() in (ZZ, QQ, AA, QQbar):
         return expn in expn.parent() # Should always return True
      if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
         return expn in expn.parent().base_ring() or expn in expn.parent().gens()

      return False

   except AttributeError as error:
      print("Exception,AttributeError in  is_atom")
      print ("cought exception" , type(error).__name__ )
      return False


def expnType(expn):

   if debug:
      print (">>>>>Enter expnType, expn=", expn)
      print (">>>>>is_atom(expn)=", is_atom(expn))

   if is_atom(expn):
      return 1
   elif type(expn)==list:   #isinstance(expn,list):
      return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
   elif  is_sqrt(expn):
      if  type(expn.operands()[0])==Rational:  #type(isinstance(expn.args[0],Rational):
         return 1
      else:
         return max(2,expnType(expn.operands()[0]))   #max(2,expnType(expn.args[0]))
   elif expn.operator() == operator.pow:    #isinstance(expn,Pow)
      if type(expn.operands()[1])==Integer:   #isinstance(expn.args[1],Integer)
         return expnType(expn.operands()[0])    #expnType(expn.args[0])
      elif type(expn.operands()[1])==Rational:   #isinstance(expn.args[1],Rational)
         if type(expn.operands()[0])==Rational:  #isinstance(expn.args[0],Rational)
```

```
            return 1
         else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
      else:
         return max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1])) #max(3,expnType(expn.
   elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #isinstance(expn,Add) or isinsta
      m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
      m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
      return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
   elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.func)
      return max(3,expnType(expn.operands()[0]))
   elif is_special_function(expn.operator()): #is_special_function(expn.func)
      m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
      return max(4,m1)   #max(4,m1)
   elif is_hypergeometric_function(expn.operator()): #is_hypergeometric_function(expn.func)
      m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
      return max(5,m1)   #max(5,m1)
   elif is_appell_function(expn.operator()):
      m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
      return max(6,m1)   #max(6,m1)
   elif str(expn).find("Integral") != -1: #this will never happen, since it
            #is checked before calling the grading function that is passed.
            #but kept it here.
      m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
      return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
   else:
      return 9

#main function
def grade_antiderivative(result,optimal):



   if debug:
      print ("Enter grade_antiderivative for sagemath")
      print("Enter grade_antiderivative, result=",result)
      print("Enter grade_antiderivative, optimal=",optimal)
      print("type(anti)=",type(result))
      print("type(optimal)=",type(optimal))

   leaf_count_result  = tree_size(result) #leaf_count(result)
   leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

   #if debug: print ("leaf_count_result=", leaf_count_result, "leaf_count_optimal=",leaf_count_optimal)



   expnType_result  = expnType(result)
   expnType_optimal = expnType(optimal)
```

```
if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",expnType_optimal)

if expnType_result <= expnType_optimal:
    if result.has(I):
        if optimal.has(I): #both result and optimal complex
            if leaf_count_result <= 2*leaf_count_optimal:
                grade = "A"
                grade_annotation ="none"
            else:
                grade = "B"
                grade_annotation ="Both result and optimal contain complex but leaf count of result is larger th
        else: #result contains complex but optimal is not
            grade = "C"
            grade_annotation ="Result contains complex when optimal does not."
    else: # result do not contain complex, this assumes optimal do not as well
        if leaf_count_result <= 2*leaf_count_optimal:
            grade = "A"
            grade_annotation ="none"
        else:
            grade = "B"
            grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(leaf_c
else:
    grade = "C"
    grade_annotation ="Result contains higher order function than in optimal. Order "+str(expnType_resul


print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

return grade, grade_annotation
```